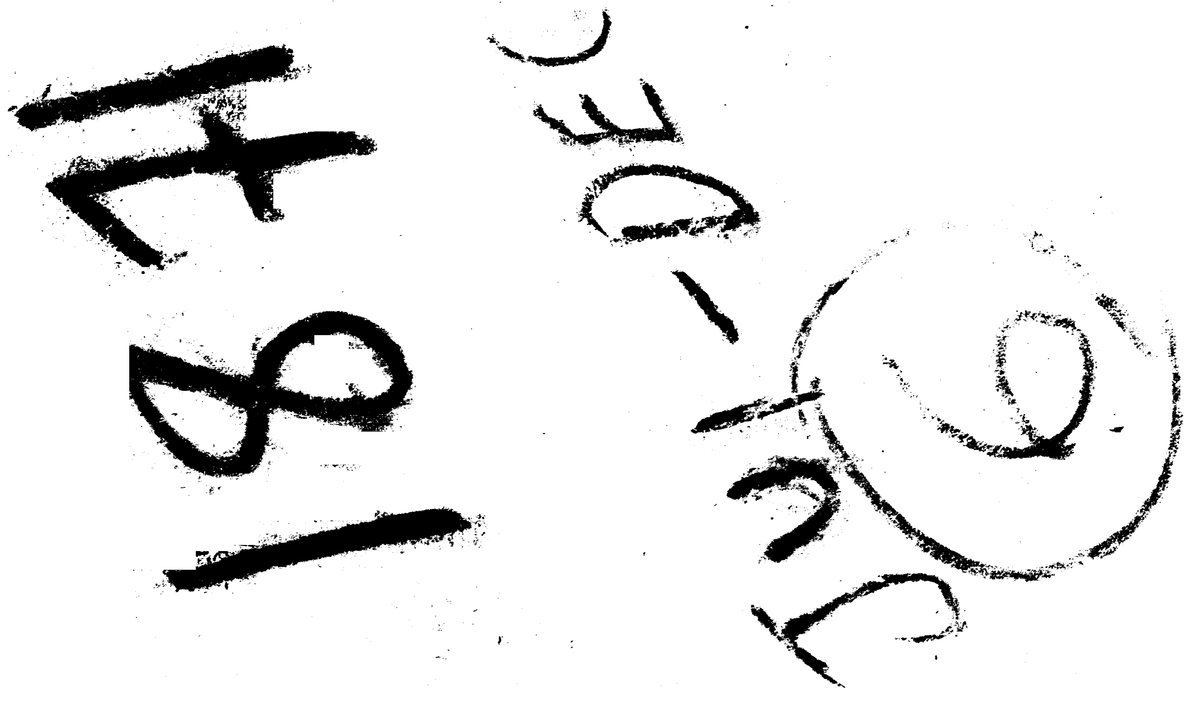


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The Gazette of India.

SIMLA, SATURDAY, JULY 1, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

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GOVERNMENT OF INDIA,

HOME DEPARTMENT.

PROVISION OF FUNDS FOR SCHOOLS ESTABLISHED UNDER LORD CANNING'S MINUTE OF 1861.

From E. C. BAYLEY, ESQ., C. S. I., Secretary to the Government of India, Home Dept., to the Chief Secretary to the Government of Bombay in the Educational Department,—
No. 243, dated Simla, the 20th June 1871.

THE Governor General in Council has observed the entries Nos. 15 and 18 in the Proceedings of the Government of Bombay in the Educational Department for the month of April last, relative to the provision of funds to meet applications made in behalf of schools under Lord Canning's Minute of 1861.

2. As regards the first entry, I am to point out that the Government of India has not transferred the burden of assisting educational institutions, like the Diocesan School at Byculla, to the Local Governments, without the provision of funds to meet such demands. The sum transferred to the Local Governments was intended to include, and was sufficient to meet, provision for all reasonable demands made in behalf of these educational institutions equally with all other kinds of educational institutions.

3. Again, the Resolution recorded in the second entry (No. 18) would virtually reverse the imperial policy initiated by Lord Canning's Minute, and abrogate the rules in force under it. It was, I am to observe, far from the intention of the Government of India in the new financial arrangements to relieve Local Governments from the enforcement of principles of imperial

policy which the Supreme Government may have laid down, or may hereafter lay down, for general observance.

4. The Governor General in Council is willing to admit that in some Provinces schools established under Lord Canning's Minute have heretofore been maintained on an expensive footing, and without due regard to the precise scope of the intentions of the minute. If this has occurred also in Bombay, it is quite open to the Local Government to correct this practice, and in future to restrict the grants on account of these schools to more suitable dimensions, and to institutions which really educate the classes for whose benefit the rules based on the minute were framed.

Extract from the Proceedings of the Government of Bombay in the Educational Department, for the month of April 1871.

[No. 15.] No. 276, April 21st.

THE Under Secretary to the Government in the Public Works Department, No. 502, dated the 21st March 1871, transfers a letter from the Honorary Secretary, Bombay Diocesan Board of Education, regarding an application made by the Board to Government for a moiety of the cost of purchasing a house in Love Lane for the accommodation of the Diocesan School at Byculla, and expresses a hope that, as funds for the purpose cannot be provided in the Public Works Department, no action will be taken in the Educational Department which will throw a liability on that (Public Works) Department.

RESOLUTION.—The Secretary to the Diocesan Board should be informed that, under the new financial arrangements ordered by the Government of India, the burden of assisting educational projects of this kind has been transferred to the Local Government without the provision of funds to meet such demands. His Excellency in Council has, therefore, no alterative but to refuse the application.

[No. 18.] No. 288, April 24th.

THE Director of Public Instruction, No. 4422, dated the 31st March 1871, submits, with his recommendation, an application from the Honorary Secretaries of the Bombay Scottish Education Society for a site, and a grant to purchase a site, for their school at Byculla.

RESOLUTION.—The applicants should be informed that their request cannot be complied with. It has already been publicly announced that, in consequence of the change in the financial arrangements of this Presidency, which has been ordered by the Government of India, the expectations which Lord Canning's minute was calculated to give rise to can no longer be realised, inasmuch as no provision has been made for making grants in conformity with that minute from imperial funds, and the resources placed at the disposal of the Local Government will not admit of their undertaking the responsibility of continuing such grants. A portion of the concessions demanded go beyond the terms of Lord Canning's minute, and would be inadmissible on other grounds, but under present circumstances it is not necessary to discuss this point.

2. The Director of Public Instruction should communicate this decision to the applicants, and should make similiar replies to *any future applications* which may be made under Lord Canning's minute.

3. At the same time copy of the papers should be transferred to the General Department in order that the attention of the Collector of Bombay may be directed to the plots of ground referred to, and that he may report what is the precise position of Government with respect to the said plots, and what he proposes to do on the expiration of the lease of one of them.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

IRRIGATION OPERATIONS OF FUSL KHUREEF IN THE PUNJAB UP TO 30th APRIL 1871.

Canal Division.	Water distributed during April 1871. Depth in Canal at regulating guage. Full supply.	Water distributed during April 1871. Depth in Canal at regulating guage. Actual throughout April.	Navigation Return Canal. Principal items of Traffic. Up.	Navigation Return Canal. Principal items of Traffic. Down.	Gross consumption, cubic feet per second. Estimated full supply.	Gross consumption, cubic feet per second. Actual average throughout April.	Chief Crops (approximate). Name.	Chief Crops (approximate). Area in acres.	Land irrigated (approximate). Zillah.	Land irrigated (approximate). Acres.	Rain-fall. Average.	Rain-fall. During month.	Remarks.
B. D. Canal. 1st Division	4·9	3·53			.....	73306	Cotton ...	2,834	Goordaspoor ...	2,217	Inches. 0·89	Miles. Nil.	389·02 cubic feet per second passed down the various escapes.
2nd " M. B. Lower	4·6	3·37			.....	87078	Rice ...	125	Umritsur ...	521	0·25	0·37	
" " Lahore Branch ...	3·3	2·60			3,0736	45104	Sugarcane...	2,552	Lahore ...	4,307	...	...	The supply maintained was fully equal to the demand.
							Others ...	1,534					
Total Baree Doab Canal ...	.....	.....	Nil.	...	3,0736	2,037·88	.....	7,045	.....	7,045	...	...	On the Western Jumna Canal the increase is principally in cotton.
Corresponding period of last year	.....	.....	.....	.....	.....	1,091·31	.....	6,370	.....	6,370	...	...	
Western Jumna Canals. Kurnaul Division	4·33	3·66	80,885 logs, kurrees, bullies, &c.	.....	.....	312·89	Cotton ...	11,471	Umballa ...	Nil.	0·55	0·17	As this is the return for the first month of the khurreef it would manifestly be premature to draw any conclusions from the slight increase in area irrigated, as compared with the corresponding period of last year.
Delhi " ...	4·4	.....		.....	.....	708·83	Rice ...	13	Kurnaul ...	3,646	0·40	0·46	
Hansi " ...	8·8	.....		.....	.....	497·90	Cotton ...	17,353	Delhi ...	10,142	...	Nil.	
" Bulla Head ...	8·4	.....		.....	2,536·0	257·10	Rice ...	2,173	Rohtuck ...	10,664	...	0·60	
							Sugarcane...		Hissar ...	4,729	...	Nil.	
							Others ...		Jheend ...	1,734	not	kept	
									Bikaneer ...	95	"	"	
Total Western Jumna Canals ...	.....	.....	Nil.	...	2,536·0	2,066·72	.....	31,010	.....	31,010	...	...	
Corresponding period of last year	.....	.....	80,885	...	.....	1,817·4	.....	22,628	.....	22,628	...	...	
Inundation Canals. Upper Sutlej Division	.....	.....	.....	.....	.....	.....	.....	.....	Lahore ...	*	...	...	* The canals in the Upper Sutlej Inundation Canals Division were dry during April. † The returns for April have not been received from the Executive Engineers of the Lower Sutlej and Chenab, or Indus Canals Divisions. It is believed that the canals in those Divisions were also dry, their supply being dependent on the rise in the rivers.
Lower Sutlej and Chenab ...	.....	.....	.....	.....	.....	.....	.....	.....	Montgomery ...	*	0·60	0·82	
Indus Canals ...	.....	.....	.....	.....	.....	.....	.....	.....	Moollan ...	†	...	...	
									Dera Gazee Khan	†	...	...	
Total Inundation Canals ...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...	
Delhi and Goorgaon Works.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...	
Total Delhi and Goorgaon Works	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...	
Grand Total ...	.....	.....	80,885	...	.....	.....	.....	38,055	.....	38,055	...	...	
Corresponding period last year ...	.....	.....	51,841	...	.....	.....	.....	28,908	.....	28,908	...	...	

W. BROADFOOT, *Lieut., R. E.,*
Asst. Secy. to Govt., Punjab, P. W. D., Irrigation Branch.

MURREE;
The 2 Wk June 1871.

No. 25 of 1871.

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, JULY 8, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

Non-Subscribers to the GAZETTE *may receive the* SUPPLEMENT *separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.*

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA *is required by Law, of which it has been customary to publish in the* CALCUTTA GAZETTE, *will be included in the* SUPPLEMENT. *For such Orders and Notifications the body of the* GAZETTE *must be looked to.*

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

PAPERS RELATING TO THE CULTIVATION OF CINCHONA AND THE MANUFACTURE OF QUININE IN INDIA.

Extract from the Proceedings of the Government of India in the Home Department (Public),—No. 645, under date Fort William, the 2nd February 1871.

READ again the following papers on the subject of the manufacture of quinine in India:

From	the Government of	Bengal	No. 478, dated 21st February 1870.
From	ditto	ditto	No. 3088, dated 4th November 1870.
To	ditto	ditto	No. 5524, dated 16th December 1870.
To	ditto	ditto	No. 5679, dated 24th December 1870.
From	ditto	ditto	No. 3282, dated 15th November 1870.
To	ditto	ditto	No. 5680, dated 24th December 1870.
To	ditto	of Madras	No. 5681, dated 24th December 1870.
From	ditto	ditto	(telegram), dated 19th January 1871.
To	ditto	of Bengal	No. 418, dated 21st January 1871.
From	ditto	ditto	No. 229, dated 23rd January 1871.
To	ditto	of Madras	(telegram), dated 24th January.

RESOLUTION.—Ever since the introduction of the cultivation of the cinchona plant in this country, the Government of India has watched with the deepest interest the progress of the experiment, feeling convinced that its success would be fraught with the most beneficial results to the whole population

of India. The advantages to be derived from the successful cultivation of cinchona cannot be over-estimated, as the object is to secure to the country at large the greatest medical boon that could be afforded to it, that is, to place within the reach of the masses of the people, at the lowest possible rates, the only effective specific that science has yet discovered for the commonest of Indian diseases.

2. That the cinchona plant, *C. Succirubra* at any rate, can be grown to any extent in British Sikkim has now been indisputably established by the results that have already been achieved at the Government plantations. And the Governor General in Council fully believes that at little present cost, and with a certainty of considerable future revenue, forests of cinchona may be reared in Sikkim which, by furnishing large quantities of quinine, may hereafter prove a blessing not only to India but to the civilized world.

3. Already the Government planations in Sikkim yield a considerable supply of excellent bark, and year by year a rapid increase in this supply may be looked for; the Governor General in Council, therefore, thinks that the time has come for a preliminary decision as to how this supply can best be utilized. This view of the case is confirmed by a very interesting report submitted by Mr. Clarke in regard to the experimental manufacture of amorphous quinine at Darjeeling. His Excellency in Council is of opinion that the best mode of settling the many doubtful points connected with this important question is the appointment of a commission to enquire into and report on the whole subject: and in communication with His Excellency the Governor of Madras and His Honor the Lieutenant-Governor of Bengal, he is pleased to nominate the gentlemen named in the margin to form the proposed commission.

Dr. Campbell Brown, *President.*
Mr. Clarke,
Dr. Simpson,
Mr. Broughton, } *Members.*

4. His Excellency in Council is well aware that any conclusions that may now be arrived at will doubtless need considerable modifications when a larger experience affords better data than at present exist. He is at the same time of opinion that it is essential to adopt without delay some regular system, the best that can be devised in the existing state of our knowledge, for dealing with the yearly increasing produce of the cinchona plantations.

5. The commission will have to consider, among other matters, whether, on general as well as economical grounds, it would be best—

(1) to send Home the whole of the bark which bears a marketable value; or

(2) to extract by a single process all soluble matter from the bark, and send Home the gross proceeds of the first precipitation; or

(3) to proceed further with the manufacture in India; and, if so, how much further; whether (*a*) only so far as is necessary to separate the several alkaloids from the resin, coloring matter, and other foreign elements which the first precipitate will contain; or (*b*) as far as the manufacture of the pure sulphate of quinine?

6. Should the commission recommend the second or third alternative, they will have to consider what processes will, under all the circumstances of the case, be most likely to prove appropriate.

7. A certain percentage of the total yearly yield of bark will, owing to its extreme poverty in alkaloids, always be unfit for the Home market; and it will be for the commission to decide how this bark may be most profitably dealt with here.

8. It is also believed that a valuable febrifuge can be readily extracted from the leaf of *some* species of the cinchona; and this point also, as well as many other kindred questions which will suggest themselves as the enquiry proceeds, will appropriately form subjects for the consideration of the commission, whose sittings should be, in the first instance, in Calcutta, but who may later, if it be considered desirable, be deputed to visit the plantations themselves.

9. The commission will carry on their enquiries under the orders of the Lieutenant-Governor of Bengal, and will submit their final report to that authority.

ORDER.—Ordered, that a copy of this Resolution be forwarded to the Government of Bengal for information and guidance.

(True Extract.)

A. Ó. HUME,
Offg. Secy. to the Govt. of India,
Home Dept.

Extract paragraphs 4 *and* 5 *of a letter from the Right Hon'ble the Secretary of State for India, to His Excellency the Right Hon'ble the Governor General of India in Council,* —*No.* 28 *(Public), dated India Office, London, the* 4*th April* 1871.

4. THERE is one circumstance that should be borne in mind with reference to the bark trade. The supply of ordinary cinchona barks is practically unlimited from South America, and the only barks that will yield a permanently remunerative return, if imported from India, are those of the best description. The ordinary kinds of bark and that of *C. Succirubra*, will be suitable for the supply of amorphous quinine in large quantities for use in India; but bark intended for exportation should be of superior quality, such as would really meet the demands of the European markets. The efforts of cinchona cultivators in India, who merely undertake the work as a commercial speculation, should be turned to the production of barks having the richest yield of crystallizable quinine.

5. I observe, among the papers forwarded with your despatch dated 15th February 1871, a letter from the Honorary Secretary of the Darjeeling Cinchona Association, complaining that its members were induced to stake their capital in an undertaking in which they only expected competition with private individuals, while, in fact, they have been brought into ruinous competition with the Government itself. I have already expressed my opinion on this point to the Government of Madras. It should be clearly understood that the Government have no intention of embarking permanently in the bark trade. In sending their cinchona bark to the London market, one object is certainly to repay the cost of introduction and experimental cultivation of the plants; but the principal intention of the Government, in sanctioning this measure, is to act as a pioneer in establishing the reputation of Indian-grown barks, and not to injure the prospects of private planters, whose success would give the Government very great satisfaction..

From R. H. WILSON, Esq., Officiating Under Secretary to the Government of Bengal, General Department, to the Secretary to the Government of India in the Home Department,—No. 1309, dated Fort William, the 8th May 1871.

WITH reference to the orders of the Government of India quoted on the margin, I am directed to forward herewith copy of a letter No. 1412, dated 30th March, from Dr. J. C. Brown, President of the Cinchona Commission, submitting with enclosures the report of the

Home Department, No. 645, dated 2nd February 1871.
Home Department, No. 467, dated 2nd February 1871.

commission on the results of the inquiry held by them into matters connected with the experimental manufacture of quinine at Darjeeling.

2. I am to add that the Lieutenant-Governor has been pleased to accept the recommendations of the commission, and has issued orders for giving effect to those contained in paragraphs 12, 17, and 20 of the report.

3. Upon the main question as to the advisabilty of a local manufacture of the stem bark into cinchona alkaloid, or the alternative of packing and drying the bark for despatch to England, the commission pronounce no definite opinion. The cost of a manufactory on the spot is still most uncertain, and for the next season's produce the Lieutenant-Governor has determined to act on the suggestion made by the commission, and to send Home for sale the bulk of the stem bark, reserving the inferior residue for the local manufactory. It has been ascertained that the manufacturing season will begin on the Rungbee Plantations by the middle of October, and enquiries are being made for a competent person to undertake the work.

4. The question of working the leaves of the cinchona may, as proposed in paragraph 19 of the report, await the result of the experiments in progress on the Neilgherries.

From DR. J. C. BROWN, Inspector General of Hospitals, Indian Medical Department, and President of the Cinchona Commission, to RIVERS THOMPSON, ESQ., Officiating Secretary to the Government of Bengal,—No. 1412, dated Fort William, the 30th March 1871.

I HAVE the honor to forward, for submission to His Honor the Lieutenant-Governor of Bengal, and ultimate transmission to the Supreme Government, the report of the cinchona commission appointed under Home Department Resolution No. 645 of 3rd February 1871, and convened under your letter No. 471 of the 18th of that month.

Proceedings of the commission, with Appendices A to H, accompany.

Report of the commission appointed by the Supreme Government of India (Resolution No. 645, proceedings of the Home Department, Fort William, 3rd February 1871) to inquire how the supply of bark from the Cinchona Plantations in Sikkim might be best utilized, and into other matters connected therewith.

WE are appointed to inquire, among other matters, how the supply of bark from the Government plantations at Rungbee, in British Sikkim, might best be utilized, and we received a separate instruction to examine Mr. McIvor, the Superintendent of the Government Cinchona Plantations in the Nilgherries.

2. We found that, as has been officially reported, *Cinchona Officinalis* has never grown well on the Government plantations in Sikkim, and is now largely dying out, and we recommend that what remains of it be cut during the present season, except a few experimental patches, which will serve, moreover, to supply seed. That portion of the bark which is worth carriage to England, and which will amount, perhaps, to 500lbs, may be sent for sale in London, and the twig bark may be worked up at Rungbee by the machinery now there.

3. We found that several years must elapse before any considerable supply of *Cinchona Calisaya* will be given by the Government plantations, and in the whole of the following report it will be understood that we refer to *Cinchona Succirubra* alone.

4. Mr. McIvor's examination was first taken. Mr. McIvor's opinion was that *Cinchona Succirubra* will never form a permanent forest plantation at Rungbee; that, as a rule, it grows splendidly for the first two years, and, where there is a good depth of soil, for the first three years; but that as soon as it reaches the cold sub-soil it is attacked by canker, and that one in three of all the existing plants more than three years old will die out within the ensuing year, hence, that the quantity of bark now upon the plantation is greater than will ever be hereafter obtainable from the existing trees.

5. Though we were not appointed with the express object of inquiring into the cultivation and prospects of the Rungbee Plantation, yet it seemed to us that, unless some reply was furnished to the opinion of Mr. McIvor, it would appear almost frivolous to enter upon a difficult inquiry as to how certain bark should be worked up, while it seemed unlikely that such bark would ever be produced. We also considered that, after having added general terms to their instructions, Government would fairly expect that we should not pass, without investigation, such an opinion as that of Mr. McIvor—a most accomplished gardener, and of more experience in Indian cinchona culture than any other man.

6. We accordingly collected the opinions of all other competent and experienced persons whom we could reach. These witnesses differ widely among themselves as to the nature, cause, name, and number of the diseases found among the cinchona plants; but they all coincide upon the one point of vital importance, *viz.*, that *Cinchona Succirubra* is not likely to die out at Rungbee, but that it will form forest there, and yield from existing plants a continually increasing supply of bark.

7. It appears to us that in the case of the introduction of an exotic tree, its rapid propagation by cuttings, and its planting out under circumstances of soil and climate, which can hardly be supposed other than very different from those subsisting in its native land, it might be dangerous to predict absolutely whether the tree will stand ten or twenty years, far more so to assume that it will stand sixty or a hundred years, as it does in its indigenous state. We are nevertheless sanguine that no such complete failure and disappearance of the trees as that contemplated by Mr. McIvor is to be apprehended.

8. A small patch of trees, 374 in all, was planted out in 1864. Of these at least 100 died during the first year, and 230 are still alive, of which number about 90 were cut to the ground in December 1870 in the process of thinning; but diseased trees are stated to have been selected for thinning out. It therefore appears to us safe to entertain a strong expectation that the trees will stand seven or eight years; and should they stand no longer, a large supply of bark might be obtained by coppicing the plantations at that age.

9. It may be seen from Mr. McIvor's evidence that against this argument he would urge that in his opinion disease is rapidly increasing over the plantations, and that the present trees of three and four years old will not stand so long as those planted in 1864 and 1866 have stood. But, again, the opinion of the gardeners in charge of the plantations is unanimous that disease is not increasing on the plantations.

10. The reasons given by Mr. McIvor (in reply to questions Nos. 30 and 30* of his evidence—*vide* Appendix A, No. 1) for supposing that disease is now spreading on the plantations, do not appear to us to be satisfactory. We therefore have not thought ourselves relieved from the duty of carrying out the main instructions of Government, *viz.*, the inquiry how the future supply of bark at Rungbee may be best utilized.

11. The stems of a few trees have been attacked by borers, of which two kinds have been observed; also a caterpillar attacks the leaves. But we do not consider that either of these agricultural pests is present in such numbers as to cause anxiety.

12. We recommend that some method be adopted at Rungbee for obtaining every six months more exact statistics regarding the condition of the plantations.

The President, Dr. Simpson, and Mr. Broughton, agreed that a tabular schedule, somewhat like that given in Appendix G, might be adopted for a return of each year's planting, and that it was undesirable that the duty of filling these up should be entrusted to the gardeners only.

Mr. Clarke thought the form of schedule suggested by him, and given with his minute in Appendix H, would be better for the reasons therein given.

13. During the cold season of 1870-71 the Rungbee Plantations have produced about 12,500lbs. of dry bark of *Cinchona Succirubra*. Of this, 5,000lbs. of the best, which is expected to fetch 1*s.* 9*d.* per pound in London, has been despatched thither for sale, the remaining 7,500lbs. have been boiled down at Rungbee.

With regard to the stem bark which will be produced in 1871-72, the question of economical advantage between manufacturing it into cinchona alkaloid by Mr. Broughton's process on the spot, and the alternative plan of drying and packing it for sale in London, will ultimately depend on the cost at which such manufacturing process can be carried out on the large scale, and we do not feel that at present we are supplied with sufficiently exact data at Rungbee to enable us to report on this point.

14. We remark, for instance, that alcohol, 80 per cent. absolute, has cost from the Medical Store-keeper. Calcutta, ten annas per pound, and the carriage to Rungbee costs three annas per pound. Mr. Gammie has reported that, with the aid of the Coffey fractional still now at Rungbee, he can make alcohol, 80 absolute, from hill maize at a cost of 2½ annas per pound; and if this can be done on the large scale, an entirely new economic aspect would be given to the whole question under consideration.

15. We therefore recommend that the bulk of the stem bark be packed next cold season for sale in London, but that experiment on a considerable scale be made in manufacturing some of this bark at Rungbee, and that an accurate record of the outlay on manufacture at Rungbee be henceforth kept.

16. We recommend that the inferior bark be worked up at Rungbee.

The cost of working 1,000lbs. of bark is not materially different, whether such bark contains five per cent. of alkaloid or only ·5 per cent. of alkaloid; and hence the economic value of Mr. Broughton's process is hardly tested by trying it on the twig bark alone, from which all the finer bark has been picked out.

17. The President, Dr. Simpson, and Mr. Broughton, are strongly of opinion that the manufacture of cinchona bark, whatever process be adopted, ought not to be entrusted to other than a qualified person, and this opinion is much strengthened by the very serious admixture of copper found in the product last sent down from Rungbee. They are also of opinion that the present work by the two gardeners should be stopped immediately.

18. We are of opinion that it is of the highest importance that some method of working the bark without boiling (if such a method remains to be discovered in the case of young red bark) should be devised. We recommend that further investigation of the method of infusion, proposed by Dr. Simpson, be therefore carried out by a competent person.

19. Cinchona leaves do not appear to contain alkaloid in quantity at all likely to repay the expense of working. They contain quinovic acid to the extent of one or two per cent. their dried weight, which can be probably extracted and issued as quinovinates of lime and magnesia. The febrifugal value of these quinovinates has not yet been satisfactorily proved; their tonic

properties are established: they are also said to be useful in bowel complaints. The Madras medical authorities are now experimenting with such preparations furnished them from the Nilgherries by Mr. Broughton. Pending the result of these experiments, we do not recommend that any attempt to manufacture the quinovinates be engaged upon at Rungbee.

20. We learn that the Medical Store-keeper is still obtaining from Europe, at high prices, considerable quantities of red bark to be used in decoctions, &c. We recommend that the indents for red bark in future should be made upon the Rungbee Plantations. It is possible that, as red bark can be furnished thence at very small cost, the employment of such decoctions may be extended advantageously in the Government medical service.

21. We have appended a very full report of our proceedings and discusions, with appendices containing the examinations of the witnesses, and various others papers, so that the whole of the information upon which our report is grounded is thus placed at the disposal of Government for reference. We have, therefore, supposed a long report unnecessary, and hope the present will supply a convenient summary of the results which we have been able to arrive at.

J. CAMPBELL BROWN, *Offg. Inspr. Genl. of Hospitals.* — *President.*

C. B. CLARKE, *Offg. Supdt., Botanic Garden, Calcutta.*

B. SIMPSON, M. D., *Civil Surgeon of Patna.*

JOHN BROUGHTON, *Govt. Quinologist, Madras.*

— *Members.*

APPENDIX A.

Examination of Witnesses.

THE questions put to the witnesses were framed with the sole object of eliciting the desired information in the most direct way, and some questions were put by individual members of the commission as the examination proceeded.

No inference, therefore, must be drawn from the wording of the questions as to the opinion which the commission accepted on any contested point.

APPENDIX A.—No. 1.

Examination of Mr. McIVOR, *who has had the direction of the Government Cinchona Plantations in the Nilgherries from* 1860 *to the present time.—(taken* 28*th February* 1871*).*

ARE you of opinion that *Cinchona Succirubra* can be grown to any extent in British Sikkim?—It can be grown to any extent.

2. Are the plants of *Cinchona Succirubra* likely to attain the size of forest trees?—From the appearance of the plants I do not think that they will form at Rungbee and Rishap a permanent forest plantation. The majority of the plants are now diseased, and thousands of them have already died of canker. As a rule, the plants have grown splendidly during the first two years, and in places where the surface soil is deep during the first three years.

On patches of damp land they have not grown at all. The disease among the plants appears to me to be caused by the roots getting into a cold, damp sub-soil.

Have you any of this canker on your plantations in the Nilgherries?—Yes; but to a very limited extent.

Then you consider the condition of the Nilgherry *C. Succirubra* Plantations to be more healthy than that of the plantations here?—Yes; certainly.

Is the average vertical growth during the first three years of the *C. Succirubra* trees in Sikkim greater than in the Nilgherries?—A few exceptional plants have a much greater growth here, in Sikkim, than any in the Nilgherries, but the average growth at the Nilgherries is greater than in Sikkim even during the first three years.

What do you suppose to be the cause of the great growth of the few exceptional plants?—It appears to be due to their having been planted over pits that have been made by the natives in digging for the roots of wild yams, and that have been afterwards washed in with fine vegetable mould.

17. May a rapid increase in the supply of bark be looked for from existing plants?—No; I think the plantations would yield more bark now than ever they will hereafter. If this question refers to the plantation of from four to six years' growth, the greater quantity of bark will be produced by cutting them down now, because the disease is rapidly destroying the plants. My impression is, that there are 100,000 Plants of the age above-mentioned which will die before the end of this year.

20. What do you consider the best means of drying the bark for export?—My limited experience leads me to suppose that the bark would be best dried as rapidly as possible in the sun.

I dried some bark in an oven, and some in the sun, taken from the same tree and of the same quality, which I sent to Mr. Howard, who found about a third more crystallizable alkaloid in the former than in the latter. I learn from Mr. Broughton that exposing the bark to too high a temperature renders the alkaloids uncrystallizable.

23. Should Government wish to extend the plantation, what species of cinchona will grow best?—It does not seem to be established which species will be the most profitable to grow. The red-bark plant is the most luxuriant, both here and on the Nilgherries.

25. What are the merits of the adjoining plantation of the Darjeeling Cinchona Association at Pomong, as compared with those of the Government Plantation?—The Pomong Plantation appears to be in as good a condition as the Government Plantation.

26. We learn that a large proportion of the trees of the Pomong Plantation were cut down last year; do you think that the plantations are thereby rendered less valuable?—The plantations may be benefited by the cutting down, as all, or nearly all, the stumps appear to have been cankered. These stools are now throwing fine vigorous shoots which promise to be free of canker for two or three years at least. If the canker is allowed to advance too far before the trees are cut down, they do not throw strong shoots from the stumps, and many of them die altogether.

30. Do you consider the canker to be spreading in the plantation?—The canker appears to me to be rapidly spreading. It is met with in all stages of development on the plants. Many plants which are now sickly must have been healthy three months ago. It appears to me that, when the roots penetrate the cold sub-soil, canker makes its appearance, and the tree subsequently makes no healthy growth.

30*. Can you give more fully your reasons for believing that the canker is now spreading in the plantations?—I judge from the fact that the young trees are healthy; that the trees of from four to seven years' growth must

have been healthy in the early stages of growth from the fact that, where the sub-soil is near the surface, the canker sets in and destroys plants long before those on a deeper surface soil are affected; from the fact that the roots in the lower sub-soil are decayed at their points, while the roots in the upper soil are still fresh and vigorous.

30* *. You have stated that, during the first two or years, the plants are healthy, and grow vigorously; do you not consider it possible that the canker in the older plants may be due to the fact of over-propagation in the first instance?—It appears to me that the canker arises from the roots entering the cold sub-soil.

31. Can you suggest any remedy for the state of canker?—It is difficult to apply a remedy to canker, because the cause generally lies in the soil. Deep cultivation, large pits filled in with surface soil, and deep draining might have a good effect, but would not in any way tend to make the cultivation profitable. This canker also exists in Java, and in the plant in the natural forests of South America, where seedlings which germinate in low, damp places generally die out in the third or fourth year.

31*. Do you consider that what you have said respecting *C. Succirubra* applies to *C. Calisaya* also?—In every respect, so far as I can judge from so small a number of plants.

APPENDIX A, No. 2.

Re-examination of Mr. McIvor *immediately after the Commission had been accompanied by him through the plantation.—(Taken 4th March* 1871).

You stated in your reply to question 17 *supra*, that your impression was that 100,000 plants of from four to six years' growth would die before the end of this year; what do you mean by a plant of four years' growth?—I meant a plant that had entered on its fourth season of growth.

Are we to understand from what you have said that you consider the soil and climate of British Sikkim to be unsuited to the growth of *C. Succirubra* and *C. Calisaya*?—It is rather difficult for me to say. My impression is that a better soil would have produced better and finer plants. As for the climate, I have no knowledge of it. Sikkim is, however, beyond the Tropic, and I believe that in South America cinchona is not found without the Tropics; but I consider this is no reason that the plants may not do well, provided the sub-soil is open and dry.

APPENDIX A, No. 3.

Examination of Mr. Gammie, *who has been in charge of the Government Cinchona Plantations as Head Gardener since January* 1866.—*(Taken 28th February* 1871).

1. Are you of opinion the *cinchona succirubra* can be grown to any extent in British Sikkim?—I am of opinion that it can be grown to any extent.

2. Are the plants of *cinchona succirubra* likely to attain the size of forest trees?—Yes.

3. Can they be grown at little cost?—Yes.

4. Can they be grown with a certainty of future revenue?—I reserve my opinion on this point.

5. Why do you reserve your opinion on this point?—Because I am doubtful of the bark retaining its present price.

6. Why do you conclude that they can be grown to any extent and at little cost?—Because labor is cheap, and the land is easily cleared, and plants are produced cheaply.

7. Do you think that disease exists among the *C. Succirubra* plants; and if so, to what extent? Yes, disease exists in some part of the plantations, and not in others.

8. What is the disease?—Canker.

9. Have not a number of plants already died?—No, not one in a thousand has died yet of canker; but plants have died out in considerable quantities from bad drainage.

10. There is a marked difference in the growth of the trees; to what do you ascribe this?—To difference in soil.

11. You are aware, I suppose, that natives dig for yams in these parts, leaving large holes open; have many trees been planted in such holes filled up with good earth, and do you think that this may account for the difference alluded to? Natives have dug for yams, but this occasions no difference in the plants. The yam-pits are rare; there are frequently ten acres without a yam-pit.

12. What depth are the yam-pits?—From two to five feet.

13. The vertial growth of the trees is great during the first three years; is this rate of growth as in the second and third subsequently maintained?—Yes; trees of five years' growth have grown as well in the fourth and fifth year as in the second and third.

14. What is the cause of the canker in the plant?—I attribute it to hard propagation so that the stock got weakened. It may be partly due be cold soil, so that the plants got weakened.

15. What do you mean by a cold soil?—A soil that retains the moisture.

16. Do you consider cold soil exceptional, or is it general over the plantation? I consider it exceptional.

17. May a rapid increase in the supply of bark be looked for from existing plants?—Yes.

18. How many plants were planted out by the end of 1866?—31,387.

19. Within what period do you expect the cankered plants to die?—They will not die. If a tree be affected with canker, and the top be cut away, it will shoot out again and become a forest tree.

20. What do you consider the best means of drying the bark for export?—The only way I have done it is to dry it in the air, and then finish over charcoal.

21. What is the cost of drying and packing 1,000 lb?—About Rs. 50.

22. Would packing in gunny bags be cheaper than in boxes?—I do not know the price of gunny bags.

23. Should Government wish to extend the plantations, what species of cinchona will grow best?—*Cinchona succirubra*; it is the hardiest plant, and will grow any were. *C. Calisaya* requires its site selected.

24. Do you know the adjoining plantation of the Darjeeling Cinchona Association at Pomong?—Yes.

25. What are the merits of that plantation as compared with those of the Government plantations?—Equal, as they stand.

26. We learn that a large proportion of the trees of the Pomong plantation were cut down last year; do you think that the plantations are thereby rendered less valuable?—Yes; for the present.

27. Do you think it would be advisable to cut the Government plantations more severely than heretofore?—At the end of four years every plant not likely to make a good tree should be cut down.

28. What do you mean by a plant that is not likely to make a good tree?—Every tree which is cankered, or hide-bound, or stunted, or wants a leader.

29. Do you consider a cankered tree and a hide-bound tree in different stages of the same disease?—No.

30. Do you consider the canker to be spreading in the plantation?—Certainly not. It is diminishing, because we have got a healthier stock.

31. Can you suggest any remedy for the state of canker?—Cut them down.

32. Would cutting down all the cankered trees leave enough standing to form a forest?—Over nine-tenths of the plantation, it would.

33. Do you consider the canker a consequence of planting in wet places?—No.

34. Do you consider *Cinchona Calisaya* to be more liable to disease than *Cinchona Succirubra*?—I have not sufficient experience.

35. From the experience you have had, do you consider the plants of *Cinchona Calisaya* promising?—Yes; in well selected places.

36. What are the conditions which you consider necessary for the growth of *Cinchona Calisaya*?—An altitude not exceeding 3,000 feet, a moist and shady situation, and good soil.

37. You have stated that the Pomong plantation has been rendered less valuable for the present: do you consider that it will become more valuable hereafter; and if so, why?—Yes: because I believe the shoots from the stools of the plants that have been cut down will make better trees than the original plants would have done.

APPENDIX A, No. 4.

Re-examination of Mr. Gammie.—(*Taken 6th March* 1871.)

38. You were present when Mr. McIvor pointed out to the Commission the existence of canker both in the young and in older plants of *C. Succirubra* and explained his views concerning it; has your opinion regarding the permanence of the plantation been thereby modified?—No; my opinion is the same as before, because in the earlier planting of 1864 and 1866 the disease—if it is to be called a disease—was much worse than it is now.

APPENDIX A, No. 5.

Examination of Mr. Kennedy, *who has been 2nd Gardener on the Government Cinchona Plantation since February* 1867.—(*Taken 2nd March* 1871.)

1. Are you of opinion that *Cinchona Succirubra* can be grown to any extent in British Sikkim?—Yes; I think so.

2. Are the plants of *Cinchona Succirubra* likely to attain the size of forest trees?—Yes.

3. Can they be grown at little cost?—Yes.

4. Can they be grown with a certainty of future revenue?—I think they ought to give a good revenue.

6. Why do you conclude that they can be grown to any extent and at little cost?—Because the other slopes in the neighbourhood are as good as those at Rishap, and when the plants grow up they will require comparatively little labour.

7. Do you think that disease exists among the *cinchona succirubra* plants; and if so, to what extent?—Yes, some of them are diseased; about one-eighth.

8. What is the disease?—Canker.

9. Have not a number of plants already died?—Yes, about 4 per cent. of the first hundred acres I planted have already died. They have not all died of canker. Some have died of damp sub-soil.

10. There is a marked difference in the growth of trees; to what do you ascribe this?—To difference in soil.

11. You are aware, I suppose, that Natives dig for yams in these parts, leaving large holes open; have many trees been planted in such holes filled up with good earth; and do you think than this may account for the difference alluded to?—I know that the Natives have dug for yams. I have only seen one cinchona plant put in a yam hole.

13. The vertical growth of the trees is great during the first three years; is this rate of growth subsequently maintained?—Yes.

14. What is the cause of the canker in the plant?—Hard propagation may have something to do with it.

14**. Do you not consider it possible that a wet sub-soil might induce canker in a healthy seedling?—It might, but such a sub-soil would never grow a healthy plant, though it might not cause canker.

16. Do you consider cold soil exceptional, or is it general over the plantation? I consider it exceptional.

17. May a rapid increase in the supply of bark be looked for from existing plants?—I do not think any increase in the supply must be expected next year. The year after that it will be very considerable. I do not see why it should not continue to increase afterwards.

17*. Why will not the yield of bark be increased next year?—Because there was no such large amount planted in 1868, and a number of vacancies occurred which were not filled up immediately.

19. Within what period do you expect the cankered plants to die?—I cannot say that I have ever seen them die of canker only in good soil. Cankered plants will die above the canker, but will spring up again from the roots, and this second growth may become a tree.

20. What do you consider the best means of drying the bark for export?—In the sun, or else under sheds so arranged that the air may pass freely through. It will then get perfectly dry in the months of October, November, February, March and April.

23. Should Government wish to extend the plantations, what species of cinchona will grow best?—*Cinchona Succirubra*, because it is more easily propagated than *C. Calisaya;* but when once planted out, I do not think *C. Calisaya* will be more troublesome.

24. Do you know the adjoining plantation of the Darjeeling Cinchona Association at Pomong?—Yes.

25. What are the merits of that plantation as compared with those of the Government plantation?—There is little difference between them.

26. We learn that a large proportion of the trees of the Pomong Plantation were cut down last year; do you think that the plantations were thereby rendered less valuable?—No; I think they were benefited, for a number of the trees cut down were cankered, and the shoots springing from the stools are quite healthy.

27. Do you think it would be advisable to cut the Government plantations more severely than heretofore?—No; I would only cut cankered trees. There is no need to cut healthy trees.

29. Do you consider a cankered tree and a hide-bound tree in different stages of the same disease?—No.

29*. Are you acquainted with the plan of slitting up the bark of a hide-bound tree?—Yes; I approve of it.

30. Do you consider the canker to be spreading on the plantation?—It is not decreasing, at any rate.

30*. Are we to conclude therefore that it is increasing?—No; I think it is about the same.

In the first year that I was here, I do not think that I observed canker at all in the plantation. The second year it made its appearance, and the third year it got worse. The fourth year it has not increased.

31. Can you suggest any remedy for the state of canker?—No.

32. Would cutting down all the cankered trees leave enough standing to form a forest?—Yes; I think so.

33. Do you consider the canker a consequence of planting in wet places?—No.

34. Do you consider *Cinchona Calisaya* to be more liable to disease than *C. Succirubra?*—No.

35. From the experience you have had, do you consider the plants of *Cinchona Calisaya* promising?—Yes.

36. What are the conditions which you consider necessary for the growth of *C. Calisaya*?—The same as for the growth of *C. Succirubra.*

42. Of the plants of 1866 planting, how many have died?—There were about 25,000 standing of previous years' planting when I came here in 1867; of these about 2,500 have died. About half of the trees have been cut. They have died out in patches.

You say there were about 25,000 trees in permanent plantation when you first came here in 1867, of which about half have been cut, and about 2,500 are dead. Some 10,000 plants will remain, of these what percentage do you expect will die in the course of the next three years?—About 3 per cent.

APPENDIX A, No. 6.

Examination of MR. JAFFREY, *the 3rd Gardener, who has been in the Government Cinchona Plantations since* 1862.—(*Taken 2nd March* 1871.)

1. ARE you of opinion that *Cinchona Succirubra* can be grown to any extent in British Sikkim?—Certainly.

2. Are the plants of *Cinchona Succirubra* likely to attain the size of forest trees?—I believe they can be grown into forest trees.

3. Can they be grown at little cost?—I cannot speak as to cost.

4. Can they be grown with a certainty of future revenue?—I think it ought to yield a large revenue.

7. Do you think that disease exists among the *Cinchona Succirubra* plants; and if so, to what extent?—Yes, they are diseased to a considerable extent. The disease does not exceed 20 per cent.

8. What is the disease?—Canker.

9. Have not a number of plants already died?—Very few.

10. There is a marked difference in the growth of the trees; to what do you ascribe this?—To portions of land that have not been so severely cultivated by squatters. The bamboo jungle has never been cultivated, and on this the trees are luxuriant.

11. You are aware, I suppose, that natives dig for yams in these parts, leaving large holes open; have many trees been planted in such holes filled up with good earth, and do you think that this may account for the difference alluded to?—No; it has nothing whatever to do with it.

13. The vertical growth of the trees is great during the first three years; is this rate of growth subsequently maintained?—Very nearly.

14. What is the cause of the canker in the plant?—Moisture, I believe, and bad ventilation.

14.* You had charge of the plants at Lebong in 1863 before any were planted out from the nursery, the canker then appeared; to what do you attribute this?—To moisture and over-propagation.

14.** Do you not consider it possible that wet sub-soil might induce canker in a healthy seedling?—Yes.

16. Do you consider cold soil exceptional, or is it general over the plantation?—It is exceptional.

17. May a rapid increase in the supply of bark be looked for from existing plants?—Yes.

19. Within what period do you expect the cankered plants to die?—They must be cut to the ground, and then they will live. If a branch only is cankered, the branch only need be cut.

20. What do you consider the best means of drying the bark for export?—I cannot give an opinion.

23. Should Government wish to extend the plantations, what species of cinchona will grow best?—*Cinchona Succirubra* and *C. Calisaya*. What *C. pitayensis* will be, I do not know.

24. Do you know the adjoining plantation of the Darjeeling Cinchona Association at Pomong?—Yes.

25. What are the merits of that plantation as compared with those of the Government plantations?—Nearly equal; the Government plantations being the better in general appearance. This is to be attributed to aspect.

26. We learn that a large proportion of the trees of the Pomong Plantation were cut down last year; do you think that the plantations are thereby rendered less valuable?—No, I do not: the growth is rapid from the stools and superior to the original growth.

27. Do you think it would be advisable to cut the Government plantations more severely than heretofore?—Yes.

29. Do you consider a cankered tree and a hide-bound tree in different stages of the same disease?—They are decidedly different diseases.

30. Do you consider the canker to be spreading in the plantations?—I consider it to be diminishing. Formerly we had it everywhere, both in the nursery stock and in the cuttings.

30.* You stated that in your opinion canker was caused by moisture and bad ventilation; these causes remain in operation now as before; to what then do you attribute the diminution of the canker?—To a change in the manner of propagation by treating the young cuttings in a more hardy manner, and not under glass.

34. Do you consider *Cinchona Calisaya* to be more liable to disease than *C. Succirubra*?—No; it is less liable, being a less soft plant than *C. Succirubra*.

35. From the experience you have had, do you consider the plants of *Cinchona Calisaya* promising?—Yes.

35.* Are the plants of *Cinchona Calisaya* likely to die?—A few exceptional plants may die.

39. Supposing that you were to take a plant indigenous to the soil and propagate it by seedlings and cuttings, and plant it six by six over the Rungbee valley, would you expect it to be more uniform than *C. Succirubra*?—No.

44. Of the older plants now growing on Rungbee, what proportion do you expect may die from canker and other causes within the next three years?—I do not believe that any except a few tops will die.

APPENDIX A, No. 7.

Examination of MR. BIERMANN *who came as a gardener to the Rungbee Plantation in the spring of* 1865, *then had charge of the Government Cinchona Plantations in the Khasi Hills from February* 1867 *to August* 1870, *and since then has been re-transferred to Rungbee in charge of the manufactory.—(Taken 3rd March* 1871*).*

1. ARE you of opinion that *Cinchona Succirubra* can be grown to any extent in British Sikkim?—Yes.

2. Are the plants of *Cinchona Succirubra* likely to attain the size of forest trees?—Yes.

3. Can they be grown at little cost?—I prefer to say nothing about the cost.

4. Can they be grown with a certainty of future revenue?—The revenue will depend upon circumstances.

7. Do you think that disease exists among the *Cinchona Succirubra* plants; and if so, to what extent?—Yes; some plants are diseased. I cannot state what proportion, because I have not lately been working in the plantations.

9. Have not a number of plants already died?—Yes; I have no idea of the number.

10. There is a marked difference in the growth of the trees; to what do you ascribe this?—To the nature of the ground.

11. You are aware, I suppose, that the natives dig for yams in these parts, leaving large holes open; have many trees been planted in such holes filled up with good earth, and do you think that this may account for the difference alluded to?—Yes; such yam holes are dug, and an exceptional cinchona tree may be affected; but one may walk a mile over the ground not planted and not see a yam hole.

13. The vertical growth of the trees is great during the first three years; is this rate of growth subsequently maintained?—The rate of growth may diminish; the subsequent rate of growth may be a little less than during the first three years.

14. What is the cause of canker in the plant?—Excess of moisture both in atmosphere and in the soil.

16. Do you consider cold soil exceptional, or is it general over the plantation?—It depends on the slope of the ground and the nature of the soil.

17. May a rapid increase in the supply of bark be looked for from existing plants?—Yes; because the growth is good, and in the older trees the bark increases in thickness.

19. Within what period do you expect the cankered plants to die?—If badly affected they may die quickly; if not so, they may recover. I have seen cankered plants take on healthy bark.

23. Should Government wish to extend the plantations, what species of cinchona will grow best?—*C. Succirubra*, without doubt, because it is a rapidly growing tree. I have, however, not had much experience of *C. Calisaya*.

24. Do you know the adjoining plantation of the Darjeeling Cinchona Association at Pomong?—Yes.

25. What are the merits of the plantation as compared with those of the Government plantations?—Just equal. I can perceive no difference.

26. We learn that a large proportion of the trees of the Pomong Plantation were cut down last year; do you think that the plantations are thereby rendered less valuable?—It cannot much make difference, since from what I have seen in those places where the trees have been cut, there are enough left to cover the ground within a short time.

27. Do you think it would be advisable to cut the Government plantations more severely than heretofore?—No; the present cutting is now sufficient.

29. Do you consider a cankered tree and a hide-bound tree in different stages of the same disease?—No; I think they are different diseases. I do not think the disease seen in the cinchona trees is the same as that known as canker in Europe, but I am not sure on this point.

30. Do you consider the canker to be spreading in the plantation?—No; I do not. I consider it to be diminishing.

In 1865 about 380 plants had been planted out in permanent plantation, and I was told that these were all unhealthy when put out the preceding year. After the rains sixty died at one time and more died shortly afterwards, some recovered. If this rate of death had continued, 75 per cent. of these plants would now be missing, whereas I have now examined closely and find 236 alive.

If the canker had been equally fatal in succeeding years in other parts of the plantation as it was in 1865, the plantations would show gaps even if the vacancies had been filled up.

31. Can you suggest any remedy for the state of canker?—No; but I would cut cankered trees down below the cankered spots, and I would avoid planting where there is no natural drainage.

Of the older plants now in the plantations, few, if any, will die where there is drainage; where there is no drainage, more will die.

31.* Do you consider the natural drainage of the plantation to be good or bad, speaking generally?—Good, as a whole.

39. Supposing that you were to take a plant indigenous to the soil and propagate it by seedlings and cuttings, and plant it six by six over the Rungbee valley, would you expect it to be more uniform than *C. Succirubra*?—No; I should not.

APPENDIX A, No. 8.

Examination of MR. SPICER, *the 4th Gardener on the Government Cinchona Plantations, who has been continuously employed there since July* 1865.—*(Taken 3rd March* 1871.*)*

ARE you of opinion that *Cinchona Succirubra* can be grown to any extent in British Sikkim?—Yes.

2. Can the plants of *Cinchona Succirubra* be grown at little cost?—Yes; and at a very much less cost than heretofore.

7. Do you think that disease exists among the *Cinchona Succirubra* plants; and if so, to what extent?—Yes; there is one or two here and there cankered; about 2 or 3 per cent.

9. Have not a number of plants already died?—One or two here and there have died, but there are few vacancies.

10. There is a marked difference in the growth of the trees; to what do you attribute this?—To difference of soil.

11. You are aware, I suppose, that natives dig for yams in these parts, leaving large holes open; have many trees been planted in such holes filled up with good earth, and do you think that this may account for the difference alluded to?—There are lots of yam holes, but this does not account for the difference in the growth of the trees.

13. The vertical growth of the trees is great during the first three years; is this rate of growth subsequently maintained?—Yes.

14. What is the cause of the canker in the plant?—Harsh and gravelly soil.

16. Do you consider the harsh soil exceptional, or is it general over the plantation?—It is not general.

17. May a rapid increase in the supply of bark be looked for from existing plants?—Yes; certainly.

30. Do you consider the canker to be spreading in the plantation?—No.

30*. Must a plant which is cankered die?—Some die, some live.

APPENDIX A, No. 9.

Examination of MR. MUNRO, *who has been in charge of the Cinchona Plantations of the Darjeeling Association at Pomong, as Head Gardener since December* 1863*; had fifteen years' experience as a Gardener and Forester in Europe, and was trained three and-a-half years in the Edinburgh Botanic Garden.—(Taken 6th March* 1871.*)*

ARE you of opinion that *cinchona succirubra* can be grown to any extent in British Sikkim?—Yes; decidedly.

2. Are the plants of *cinchona succirubra* likely to attain the size of forest trees?—I expect them to grow to the height of 30 feet at least. I do not see why they should not grow as high as in their native land, when we grow them from seedlings: but my present plantation of 5,00,000 have been raised by cuttings from ninety-two plants, and we hardly expect forest trees raised by cuttings to grow to a large size. By the rapid propagation at first here practised, the constitution of the plants was weakened.

3. Can they be grown at little cost?—Yes, they can be grown at very little cost. We merely make a hole in the ground and stick a plant in.

4. Can they be grown with a certainty of future revenue?—At present prices it can be grown to a profit.

7. Do you think that disease exists among the *c. succirubra* plants; and if so, to what extent?—There is no disease whatever except canker, which is hardly worth calling a disease.

In former years' planting it was heavy, say 5 per cent. or more in the 1866 planting; in later years' planting, it is much lighter, say 1 per cent. in the 1869 planting.

9 Have not a number of plants already died?—I cannot say that any have died of canker only; some may have been broken across by canker very low down, but generally they have thrown fresh healthy shoots from the root.

10. There is a marked difference in the growth of the trees; to what do you attribute this?—To some plants being stronger in constitution than others when planted, and to some plants getting into better soil than others.

11. You are aware, I suppose, that natives dig for yams in these parts, leaving large holes open: have many trees been planted in such holes filled up with good earth, and do you think this may account for the difference alluded to?—Yes, there are yam holes, but we do not fill them up, nor do we plant in them.

If a plant got into a yam hole filled up with good earth, it would very probably grow well; but not one plant in a hundred can be so situated.

13. The vertical growth of the tree is great during the first three years; is this rate of growth subsequently maintained?—As far as I have seen, the rate of growth is maintained.

14. What is the cause of the canker in the plant?—Hard propagation; the canker is helped on if the plant gets into poor soil or into a place where the water stagnates. Numbers of plants die out from wet soil, but this has nothing to do with canker, from which such plants may be quite free.

16. Do you consider the wet soil to be exceptional, or is it general in the Rungbee valley?—A wet subsoil is exceptional, the drainage is in general good.

17. May a rapid increase in the supply of bark be looked for from existing plants?—Yes; most decidedly.

19. Within what period do you expect the cankered plants to die?—I do not expect the cankered plants to die. I cut them over and generally obtain healthy shoots.

20. What do you consider the best means of drying the bark for export?—We are drying our bark under sheds and finishing over charcoal.

21. What is the cost of drying and packing 1,000lb?—Roughly Rs. 26; that is, exclusively of taking the bark off the trees, which costs nearly as much more. (A note subsequently given the Secretary by Mr. Munro.)

22. Would packing in gunny bags be cheaper than packing in boxes?—I do not know the price of gunny, but I should think it would be cheaper.

23. Should it be wished to extend the plantations, which species of chinchona will grow best?—*C. succirubra.* I have very little experience of *c. calisaya;* but so far as I have seen it in the Government plantations, *c. calisaya* may do as well as *c. succirubra.*

29. Do you consider a cankered tree and a hide-bound tree in different stages of the same disease?—No.

31. Can you suggest any remedy for the state of canker?—Cut them down and get young shoots from the stools.

34. Do you consider *cinchona calisaya* to be more liable to disease than *cinchona succirubra*?—No; so far as I have seen, I have little experience of *c. calisaya.*

39. Supposing that you were to take a plant indigenous to the soil and propagate it by seedlings and cuttings, and plant it six by six over the Rungbee valley, would you expect it to be more uniform than *c. succirubra*?—No, you have only to look in the jungle, and you will see that any trees, as the *chelonia*, will grow in one class of situation and avoid another, as the soft places.

40. Do you see a difference between your plants from cuttings and those from seeds in growth and healthy appearance?—No.

41. You have stated you have canker: is it among the plants raised from cuttings only, or is it also among those raised from seed?—Among both.

I raised two years ago a large quantity of plants from Ceylon seed, these are now nearly free from canker.

Our own seedings were mostly raised from seed of cankered trees, and they also exhibit canker, but the seedlings which I am now raising from seed of sound trees I expect to exhibit little canker. From the state of cuttings which I have received from Ceylon, I infer that in Ceylon they were propagating much less severely than we do.

We received our first cuttings from the Nilgherries, and these were extensively affected with canker.

APPENDIX A, No. 10.

Examination of MR. SCOTT, *Curator of the Calcutta Botanic Garden.*—(*Taken 17th March* 1871).

You have been educated as a horticulturist, where?—At the Botanic Gardens, Edinburgh, under Dr. Balfour and Mr. McNab.

You have, we understand, conducted many important and delicate investigations in vegetable physiology: can you particularize any of these?—My investigations have principally been in structural anatomical investigations of the higher cryptogams.

I have also carried out a number of biological experiments for Mr. Darwin: my papers describing the detailed results of these are printed partly in the publications of the Linnœan Society of London, partly in those of the Edinburgh Botanic Society.

When were you put in charge of the cinchona plants at Rungbee?—In January 1865.

How long did you retain charge?—Till May 1865.

Was there any disease at that time among the cinchona plants?—Yes; I observed a disease in the bark. It was not very prevalent, but I occasionally observed it. It was exhibited not only in the plantation, but also in the pot-culture, and in the nursery beds.

What was the nature of that disease?—It first presented itself as a discoloration of the bark and a softening of the cellular tissue; a communication of it inwards, discoloring the wood opposite, ensued.

So far as the process extended, the tissues and the wood had their vitality completely destroyed.

Did you examine closely the diseased plants?—Very closely, and the items most particularly.

What conclusions did you come to concerning the cause of this disease?—The cause appeared to me to lie in the atmosphere rather than in the soil. I noticed that the disease broke out especially after several days' continued rain, and seemed to me caused by a saturated state of the atmosphere inducing suppressed transpiration and a local decomposition of the sap. Then follows a transfusion of the diseased juices into the adjoining parts of the wood. The disease is intensified by a moist state of the soil, but in my opinion does not originally proceed from the soil.

Have you visited the Sikkim cinchona plantations since 1865?—It was in 1866 and again in 1868 for three weeks or a month on each occasion.

You may have heard that doubts have been raised whether *cinchona succirubra* will grow into a forest in Sikkim; are you able to offer any opinion on this point?—So far as I have had opportunity of observation, I see no reason to doubt that it will. I think the disease will gradually disappear as the plantation gets thinned.

10. There is a marked difference in the growth of the trees; to what do you ascribe this?—To the circumstances of the soil.

16. Do you consider cold soil exceptional, or is it general over the plantation?—Exceptional.

29. Do you consider a cankered tree and a hide-bound tree in different stages of the same disease?—Certainly not.

29.* Is there more than one form of disease among the cinchona plants?—The above is the only form of disease that I observed as sufficiently common to merit attention.

31. Can you suggest any remedy for the state of canker?—I do not consider the disease which I have been describing to be canker at all. Canker arises from a wet subsoil, and may be cured by removing the cause.

Canker proceeds from the root; the disease in the cinchona plant proceeds from the eaves. The early stage of the disease in the cinchona plants in no wise resembles canker. It first appears as a minute patch on the bark, as if a drop of nitric acid had been placed on the plant at that point.

Do you consider that a cinchona tree diseased as above described must die?—When the disease extends circularly round the stem, the portion above the diseased ring must die, not the portion below; when the disease spreads longitudinally, the plant may heal up.

34. Do you consider *cinchona calisaya* to be more liable to disease than *cinchona succirubra?*—So far as my experience goes, *cinchona succirubra* is the more liable to disease; but there was very little *c. calisaya* at Rungbee when I last visited there.

39. Supposing that you were to take a plant indigenous to the soil, and propagate it by seedlings and cuttings, and plant it six by six over the Rungbee valley, would you except it to be more uniform that *c. succirubra?* I do not think that any plant would stand uniformly over such a place. Some of the ground planted in 1868 were mere marsh.

It has been suggested that the disease in the *cinchona* plant has been induced by over-propagation; do you at all admit this view?—Severe propagation will weaken the stock, but the cuttings even from weakened stock plants, if placed under favorable circumstances, will be as vigorous as the direct progeny of seeds.

In taking cuttings, would you willingly propagate from a cankered stock plant?—As readily as from a healthy plant, provided I could find a healthy shoot to make a cutting of. I took on this disease as entirely a local affection.

APPENDIX A, No. 11.

Examination of MR. MANN, *Assistant Conservator in the Bengal Forest Department.—(Taken 25th March* 1871.)

WERE you educated as a gardener?—I was educated as a gardener in Brunswick, and subsequently in many places—all over the Continent of Europe, indeed.

Did you come out to India to take charge of the cinchona plantations; and at what date?—I came out in April 1864, and I went up to Sikkim. The cinchona plants were then mainly at Lebong, whither they had been removed from Sinchul. When I arrived, Rungyroong was the nursery. Rungbee was totally uncleared, and during that summer we made a commencement of clearing and planting at Rungbee.

How long did you retain charge of the cinchona?—Until Mr. Gammie came out, in 1866. I remained in British Sikkim as a forest officer up to November 1868, and during such time frequently had opportunities of visiting the cinchona plantation.

Was there any disease among the cinchona plants in 1864?—Yes.

What was the nature of that disease?—A disease in the bark, and it formed furrows in the bark up and down the stem; not round patches. The disease I should hardly call canker; it is a stoppage of the sap only. The disease in the bark of cinchona I have frequently seen to heal up.

Did you examine closely the diseased plants?—At that time frequently.

What conclusions did you come to concerning the cause of this disease?—Pressure of propagation, the exceeding artificial rapidity with which the plants were multiplied. More particularly I attribute the disease to the treatment under propagation. We forced the young plants in frames very hard and planted them out suddenly.

You may have heard that doubts have been raised whether *cinchona succirubra* will grow into a forest in Sikkim; are you able to offer any opinion on this point?—Forest is a vague term: they seem to be forest now. If by forest is understood trees of 30 to 40 feet, I think they will quite grow up to that.

10. There is a marked difference in the growth of the trees; to what do you arttribute this?—The same difference is always observed in plantations on a large scale as in our forest operations. In gardens sufficient attention may be paid to each plant, but in planting large areas, the coolies cannot be superintended in planting each plant; one young plant may have the earth torn from the root or allowed to drop before planting, and it may never overtake its neighbours.

No care could make up for deficiency in soil: that will show itself very rapidly. Aspect and elevation, too, tells very remarkably on cinchona.

16. Do you consider cold soil exceptional, or is it general over the plantation?—It is not general, but it is more common in Rishap than in Rungbee.

29.* Is there more than one form of disease among the cinchona plants?—No; only one. I never observed the disease to spread circularly round the stem.

39. Supposing that you were to take a plant indigenous to the soil and propogate it by seedlings and cuttings, and plant it six by six over the Rungbee valley, would you expect it to be more uniform than *c. succirubra?*—No, or very slightly so; but some plants have a very wide range in nature,—are universal plants.

In taking cuttings, would you willingly propagate from a diseased stock plant?—If I could get a good cutting from an unsound plant, I imagine it might produce a sound tree; but I should decidedly select my cuttings from the soundest plants.

You planted out, we understand, with your own hands the plants that were planted out in 1864; how many were then planted out?—It may be seen exactly in the records.

Do you recollect the state of those plants when planted?—Ten per cent. perhaps were old, exhausted stock plants from the Neilgherries, 90 per cent. were healthy cuttings of our own propagation.

Did many of those plants die in the first two years?—Not very many, I think; but I believe it is not improbable that the whole of the exhausted plants died.

When I last visited the Sikkim Plantation in 1868, it was my opinion, as was then Dr. J. Anderson's, that the condition of the plantations had generally improved. I am positive that the percentage of diseased plants had greatly diminished. We had then got very much stronger stock plants.

I do not at all believe that the disease is caused by external conditions.

APPENDIX B.

Statement of Expenditure in collecting, carrying, and manufacturing one thousand pounds of Succirubra Twig Bark (wet).

	Rs.	As.	P.
40 women collecting bark, at 3 annas 1 pie per working day ...	7	11	4
Carriage of bark, at 4 annas per maund	3	2	0
Coolie labor for boiling, pressing, precipitating, and filtering ...	3	8	0
Lime	0	12	0
Drying and grinding precipitate	0	8	8
Working cone, and charcoal for ditto	1	4	0
Recovering alcohol	0	8	0
Loss of alcohol	1	4	0
Filters, gum, bladder, &c., and drying and pounding the alkaloids ...	0	12	0
Total ...	19	6	0

To the above amount required to be added cost of 7½lbs. sulphuric acid, 2lb. hydrochloric acid, interest on cost of machinery, and European superintendence.

Average yield of alkaloids from 1,000lbs. of wet bark ... 15oz.

RUNGBEE;
The 6th March 1871.

J. GAMMIE.

APPENDIX C.

Report of some numerical results obtained from examination of the condition of the "C. Succirubra" plantations by MR. C. B. CLARKE, *in March* 1871, *under instructions of* DR. CAMPBELL BROWN, *President of the Cinchona Commission.*

THE following numeral results were obtained by following a single line of plants across the plantation, examining every tree. Patches of 1864 and 1866 planting were examined for reasons given in the notes; and in 1867 plantation, two lines were taken in order to get a larger number of plants within the breadth of the plantation.

2. This examination confirmed my opinion that the tabulation of results of no practicable number of trees would furnish sound grounds for generalization concerning the whole,—though the figures are for other purposes by no means without value. I selected good pieces of plantation in running the lines through the 1870 planting and line B through 1868 planting, but the other lines pass mostly through inferior parts of the plantation. Very different numerical results would have followed a different choice of lines for examination.

3. The trees are planted, where the ground permits, six feet by six; holes at these distances, called *tullies*, are prepared. If the ground, from stoniness or wetness, is exceedingly unfavorable, no *tullies* are prepared in this part of the line: and where a *tully* has been prepared, no plant is put if a large stone is found close to the surface of the soil, or the *tully* otherwise appears very unpromising. After the first year the vacancies in the lines are filled up. No further filling up is done, because it is assumed, if two plants die out in the same *tully*, that it is probably not a favorable one, and at six feet apart a moderate percentage of vacancies does no harm.

Hence it is impossible to estimate, except by guess, the percentage of vacancies in the existing plantation. Where a vacancy in bad ground occurs in the line, we can often not ascertain how many *tullies* were originally dug; and where sufficient marks remain to assure us about this, we are not certain how many ever had trees planted in them.

4. The fourth column shows the percentage of trees standing now sound, *i. e.*, which do not show any rotten places in the bark, however small.

In this column are included trees which have lost their leaders. Such trees may have lost their leaders by circular bark disease, hail, borers, wind, or various accidents; but if the tree showed no unhealthy bark, I could not generally venture to guess what might have been the cause of the loss of the leader.

In this column also are included very many trees exhibiting long scars where the bark has been affected and longitudinal strips of it have died; but where the bark on the edges of such marks is now quite sound, and the whole plant vigorous, and, in our opinion, likely to make a good tree, I was in great difficulty how to tabulate these cases, which are very numerous in the older plantations.

5. The Rungbee valley is a gigantic stony landslip. The surface is covered in places with a very irregular thickness of vegetable earth; it may vary from six inches to several feet in thickness within a short distance. The soil below this is gritty and poor, filled with stones of every size, but in no place that I examined did I find clay below the vegetable earth. The *cinchona succirubra* trees exhibit the best growth where the vegetable soil is deepest; they become stunted and may never make trees where there is no vegetable soil at all: they die out where there occurs stagnant water at their roots. These very simple remarks are all that I can offer regarding the

effect of soil, concerning which I received particular instructions to make observation.

YEAR OF PLANTING.	Tullies examined.	Trees standing.	Percentage of trees standing now sound.	Average height of trees standing.	Approximate elevation of the trees above the sea in feet.
				Ft. In.	
1864 ...	156	68	67	13 0	2,500
1865 ...	None planted.				
1866 ...	144	118	81	12 0	2,500
1867 ...	499	437	76	8 0	2,200—1,500
1868(*a*) ...	327	273	71	3 6	3,000—2,400
1868(*b*) ...	133	112	83	6 4	2,300—1,900
1869 ...	287	230	85	2 8	2,800—2,300
1870 ...	100	90	97	3 0	2,400

Note on the figures above for 1864.

IN 1864 only one patch of 380 plants was planted out. No line of any length could be run through it, and the northern portion was selected for examination.

Of the 156 *tullies* examined, 53 contained the living stools of trees lately cut in the process of thinning. The ground remains well covered.

Of the 68 standing trees, 57 show distinct signs that they have at some period or other of their lives suffered from bark disease, and the other 11 have been nearly all cut down, at least once, which leads me to a strong suspicion that they have also been unhealthy at some time. These 1864 trees might be statistically returned 100 per cent. diseased if our theory of "canker" be adopted, but their produce in bark has been satisfactory, and many of them are now very fine trees: in my opinion, likely to stand. It does not appear that any tree has ever died of bark disease, but several have been broken across at various heights from the ground by circular bark disease, and others would never make fine trees unless cut near the ground, and they shall then throw a healthy shoot. The soil on which this patch stands is exceptionally good, as is also the drainage.

Note on the figures above for 1866.

IN selecting the trees of 1866 for examination, there were four very different pieces of plantation to choose from, *viz.*,—(1) the Teesta plantation; (2) the Rishap corner; (3) Kennedy's ridge; and (4) the Rungbee patch.

Of these the last was selected because—(1) the Teesta plantation was known to be remarkably clean stemmed; (2) the Rishap corner has been judged by Mr. McIvor to be the finest Rungbee plantation; (3) Kennedy's ridge was planted late in 1866, and so many of the plants died, that it was largely re-planted in 1867; moreover, it has been lately very heavily thinned.

In this case (as in the 1864 planting) no long line could be taken, and a patch was examined; it chanced that the piece selected comprised a corner of old bamboo jungle which was exceptionally good.

Of the 144 *tullies* examined, 17 contained the living stools of trees cut in December 1870 for bark in the course of thinning; the trees thinned out were doubtless the worst.

Of the 118 trees now standing, 44 at least have at some time or other suffered from bark disease; of these, 22 are reckoned above as "now sound."

Many of the trees (as also of the 1864 trees examined) have been heavily barked, *i. e.*, strips three feet long have been taken off for half the circumference of the stem. The bark appears invariably to have grown again; but we must suppose the growth of the trees to have been checked by this process.

Note on the figures above for 1867.

The strongest portions of the 1867 planting have been thinned; the lines examined were selected so as to pass through parts (autumn planted) of 1867 plantation, which have not been thinned.

The soil here is in turn swamp, rock, and slopes covered with good vegetable mould, giving the plantations the patchy aspect which characterizes lower Rishap. The upper 100 and lower 100 trees in these lines would have given totally different results; the upper 100 would show but 60 per cent. with stems now sound, the lower 100 would show 83 per cent. with clean stems.

In this respect, however, this one line gives correctly the character of the whole plantation in lower Rishap, as I know from other observations.

Note on the figures above for 1868.

The line (A) selected for examination commenced at the point near Spicer's Hut, where Mr. McIvor pointed out his views to the cinchona commission. It no doubt passes through the worst portion of the 1868 plantation, and indeed through the least successful part of the whole Rungbee plantations.

On running this line across the whole breadth of the 1868 planting from this point, the frequency of occurrence of diseased bark does not appear very high, but the number of stunted shrubby plants is very great; the average height of the upper 167 plants being but 2 feet 10 inches. These trees were, as I understand, planted carefully and well, but the ground here is almost entirely wanting in a cover of vegetable soil.

The line (B) was selected (for contrast) in the good portion of the 1868 plantation. Of the trees marked as not having clean stems, only a very small percentage were, in my opinion, affected with any unhealthiness likely to prove serious.

The percentage of clean stemmed trees in (A) and (B) does not appear very different, and gives no idea of the really different character of the planting, which, however, is faithfully represented by the average heights of the trees.

Note on the figures above for 1869.

The line selected passes through the whole breadth of the 1869 planting, and the upper end of the line passes through some of the least successful plantation.

As in the case of line (A) in the 1868 planting, the recorded percentage of clean stems does not distinctly bring out the state of the plantation, but the difference in height shows distinctly enough how inferior the growth at the higher level is to that at the lower.

Note on the figures above for 1870.

I selected here a good part of the plantation for examination.

The vacancies recorded occur chiefly in a swamp where the trees in all the adjacent lines are dead.

These fine young trees were raised by cuttings from old stock plants.

I regret the length to which these notes extend, but I fear that, even with this copiousness of remark, the statistics given may be misleading, giving in some respects too good, in others too bad, an impression if generalized from.

C. B. CLARKE.

APPENDIX E.

As the committee is unable to arrive at a unanimous decision as to the process best adapted for the extraction of the alkaloids in a tolerably pure state, Mr. Broughton's opinions on the subject differing so essentially from mine, I am obliged to submit my views to Government in a distinct report.

In order to place the matter before them in as clear a light as possible, and to render a comparison of the two processes more easy, I will first briefly describe that adopted by Mr. Broughton in all its stages, and afterwards that which I am led to think will be most suitable under present circumstances. Mr. Broughton's process includes the following operations, numbered in the order in which I have put them down:

I. The fresh bark is boiled for several hours in a copper boiler with water containing a certain amount of sulphuric acid; the bark is then squeezed in a powerful press, and the operation repeated two or three times with fresh water and acid.

II. The acid decoction, containing the cinchona alkaloids in solution, mixed up with a number of impurities extracted by boiling, is allowed to cool.

III. Milk of lime is added in excess to the liquid. This causes the precipitation of the alkaloids together with a quantity of impurities extracted from the bark by boiling.

IV. After some time this precipitate is thrown into bags and allowed to drain.

V. The precipitate is dried.

VI. The precipitate is reduced to a coarse powder between ordinary grindstones.

VII. The precipitate is now put into a copper vessel, which is fitted to another of the same metal containing alcohol acidified with sulphuric acid. This alcohol is then heated, and by an ingenious contrivance the hot vapour of it is made to permeate the precipitate over and over again until the latter is supposed to be exhausted of all its alkaloid. This operation takes a considerable time, at least forty-eight hours being required for the exhaustion of 50lb. precipitate.

VIII. The copper retort containing the alkaloids dissolved in the acidified alcohol is connected with the worm of a still and the alcohol recovered, leaving behind in the retort the alkaloid, of the consistence and colour of treacle or tar, owing to the admixture of a considerable quantity of coloring matter and resin, &c., &c., which was washed out of the precipitate along with the alkaloids by the alcohol in operation VII.

IX. This dark acid mass is now thrown into a bucket of cold water, the effect being to precipitate a quantity of impurities (very variable), and to leave the alkaloids and the remainder of the impurities dissolved in the water.

X. The precipitated impurities having been removed, caustic soda or potash is now added to this acid solution of the alkaloids, so as nearly to neutralise all the free acid. (This requires some dexterity; if carried too far, there will be a considerable loss of alkaloid; if not far enough, the preparation will ultimately have a bad colour.) The object of this is to precipitate a further quantity of colouring matter, &c., whilst the bulk of the alkaloids remains in solution.

XI. Filter the above, and to the filtrate add soda or potash in excess, which will precipitate the alkaloids.

XII. Allow the precipitate to drain in bags.

XIII. Dry the precipitate, which is Mr. Broughton's so-called *amorphous quinine.*—*Vide* sample A.

N. B.—In addition to all these details, a considerable amount of alcohol adheres to the exhaused precipitate. This has to be washed out with water and recovered by distillation.

Dr. Simpson's Process.

I SHOULD premise, before entering on its details, that it was suggested to me by Professor DeVrij, whilst I was studying the chemistry of the cinchona barks in his laboratory, as a process likely to prove very suitable for the extraction of the alkaloids from the fresh bark at Darjeeling. I have named it my process merely in contradistinction to that of Mr. Broughton. The principles are novel in neither, whilst some of the practical details are so in both.

I advocate it in preference to Mr. Broughton's process, because I think it much simpler in its details, and because it produces a safer product. I judge from Mr. Clarke's working of the process, as I have not seen any specimen of that prepared in Madras.

I. Infuse* the bark in cold dilute acid for at least twenty-four hours: squeeze in a powerful press, and repeat the operation three times.

* Mr. Broughton has called my attention to the fact that I have omitted to state that the bark must be crushed.

II. To the acid infusion which contains the alkaloids and some impurities (but infinitely less of the latter than extracted by boiling) add potash or soda in such quantity as nearly to neutralize the acid; this has the effect of throwing down a quantity of colouring matter and other impurities, the bulk of the alkaloids remaining in solution.

III. Filter the above, and to the clear filtered solution add soda or potash in excess, and the alkaloids are precipitated.

IV. Dry the precipitate, which is the *cinchona alkaloids* by Dr. Simpson's process.—*Vide* sample B.

A casual glance at the above would naturally lead any one (even a chemist unacquainted with the cinchona alkaloids) to the conclusion that the last described process is infinitely the better of the two, always supposing the products to be equal in value.

I should be sorry, however, that any such conclusion should be hastily formed. Mr. Broughton has had great experience in working with fresh bark, and I have had, speaking comparatively, none. He assures me that he has tried my process, though, he admits, not with all the conditions fulfilled, and that he has settled on his own as the most suitable one.

The only real objection that can be raised to this process is *loss of alkaloid* or a greater amount of acid (and consequently more alkali) required to extract by cold infusion the same amount of alkaloid that can be obtained by *boiling* with a lesser quantity. I am of opinion, however, from some experiments I have made bearing on this very point, that both loss of alkaloid and any great additional expenditure of acid may be obviated in practise by using certain precautions in the details of the process. At the same time I wish it to be clearly understood that I do not uphold this process to the exclusion of Mr. Broughton's or any other; but on account of its great comparative simplicity, and the fact that the apparatus necessary to carry it out, even on a large scale, can be purchased on the spot at a nominal cost, I strongly recommend the Government to give it a fair trial in competent hands.

The questions to be determined by the experiment would be—

1*st* whether the process yielded less akaloid than is obtained by Mr. Broughton's from a similar sample of bark.

2*nd* if less, how much less; and whether or not the loss in alkaloid is not more than compensated for by the cheapness of process and requisite machinery. If after a sufficient trial the loss should still prove serious, I should either modify or abandon the process; if not, I think there can be no doubt as to its being the better one of the two.

There are, in my opinion, defects of a much more serious nature in the process advocated by Mr. Broughton,—one of them at least being of a grave nature. First of all, there is the chance of an explosion; the process as performed at Rungbee being left a good deal in the hands of Native coolies, and the retorts containing the alcohol being treated with naked fire.

Next, there is the constant liability of Government being cheated in the matter of alcohol, a beverage of which hill coolies are particularly fond; and last, though not by any means least, is the danger of the product being contaminated with copper if the operation be not conducted with care and skill. Indeed, I can hardly conceive its not being so contaminated during some stage of the process, and to remove this, contamination must, therefore, be considered as another stage or operation in Mr. Broughton's process.

This gentleman's chief objection to the cold infusion is the alleged loss of alkaloid, which, he says, is practically *nil* in his process.

Considering the nature of the substance which he has to exhaust with alcohol, *viz.*, a quantity of alkaloid wrapped up, so to speak, in a mass of sulphate of lime, which latter is *insoluble* in spirit, I have from the first doubted whether he *did* recover all the alkaloids; and in order to test the truth of my theory on the subject, I powdered *very minutely*, and subjected to prolonged boiling in alcohol, a small quantity of the precipitate which was thrown away as exhausted at Rungbee, and I think I shall be able shortly to show the Government that I was correct in my supposition. Here again, however, I must call attention to the fact that I got this precipitate at Rungbee, aud it does not at all follow that I should succeed in obtaining similar results in Madras, where the operations are conducted under Mr. Broughton's own superintendence. The test laid down by him to show when the precipitate becomes exhausted was duly applied in this particular case before it was thrown away.

APPENDIX F.

Memorandum.

DR. SIMPSON having been good enough to allow me to read his attached report, I take this opportunity of mentioning a few facts connected with its subject.

2. My process was adopted after a thorough consideration of the whole subject, which includes Indian barks and indigenous manufacturing materials among its items. I have fully tried the process of infusion now recommended by Dr. Simpson, employing altogether about 2,000lb of red bark in the experiments. The conditions were nearly those laid down by Dr. Simpson, the only failure being that the bark was not *crushed* beforehand, but simply cut small. I found by suitable analysis that but two-thirds of the whole amount of alkaloid contained in the bark was extracted, and that the amount of acid that was requisite, even with the greatest economy, was more the four times as much as that necessary when boiling was applied. This acid being the only mannfacturing material brought from Europe, it is exceedingly necessary that it should be employed with the greatest economy.

3. Furthermore, according to Dr. Simpson's verbal statements (*vide* proceedings of commission), it is quite necessary that before the bark be subjected to his process that it should be *crushed* by machinery. Indeed, if the bark were submitted whole to the acid water, scarcely any alkaloid would be extracted. It is this necessity which detracts greatly from the simplicity of the process; nor am I aware of any existing machine which will effectively perform this necessary work. The difficulty of cutting bark small is great; but the thorough

crushing of so tough a material in large quantities appears to me to be likely to increase the cost of the final alkaloid beyond economical limits, even on the supposition that the process were otherwise effective.

4. My objections to Dr. Simpson's process are, 1*st*, that it does not extract the whole of the alkaloid; 2*nd*, that it requires far more acid than process of boiling; 3*rd*, that it entails much previous preparation of the bark. It is not claimed to be a novel process.

5. Dr. Simpson's main objections to my process are, 1*st*, the possibility of explosion; and 2*nd*, the danger of copper occurring in the product.

I may state that I now employ a condensing arrangement at Ootacamund of the most simple construction, by which no explosion can possibly occur. In nearly two years' working with less effective arrangements no explosion whatever has occurred.

It is obvious that, where copper vessels are employed, no specimen of alkaloid should ever leave the manufactory without being tested for so easily recognized an impurity. In one and half-a-years' work I have *once* had to remove copper from the manufactured alkaloid, in which case it was tested before final precipitation. It is hardly necessary for me to disclaim all responsibility for any proceeding or result met with at Rungbee.

6. The liking of coolies for alcohol has really been a difficulty. Of late, at Ootacamund, I have not lost any, because a very careful watch has been kept over its employment; but when I first began to work a certain amount was certainly stolen. Care in this particular is certainly necessary, but is effectual. Several substances suggest themselves, whose admixture with alcohol would render it unpalatable without affecting its efficiency. But if, however, the price of spirit at Rungbee be but 2 annas a pound (as appears probable from the price of grain), it will not be worthwhile to make any preparation, except watchfulness against so trifling a loss as it then becomes. Alcohol is a tool, not a material, since all except 2 per cent. is recovered and re-used.

7. My process is more complex than that advocated by Dr. Simpson, but with the exception of a small percentage of acid (about one and-one-fourth of the weight of the bark), it deals entirely with Indian materials. In has worked for one and-a-half years satisfactorily on a moderate scale. In proceedings, Madras Government, Public Department, of 11th January, No. 18, very favourable results are given as to its actual medical use. When 800lb per year are manufactured of the alkaloid, it will cost one rupee per ounce. Larger amounts will be made at a still cheaper rate.

8. With the above statements I join with Dr. Simpson in expressing a hope that his process may be fairly tried on a moderately large scale, in order that the difficulty of machinery may be fairly considered, and that it may be tried by a competent man, and on Indian red bark.

CALCUTTA;
The 25th March 1871.

JOHN BROUGHTON.
Quinologist to Government, Madras.

Memorandum attached to Schedule G., by DR. J. CAMPBELL BROWN.

Two hundred plants of each year's planting to be taken for observation: a hundred in one part of the ground, the same in another. Fifty to be counted in succession in two contiguous rows at one place, the same at another, a little distance from the point.

On the first occasion in counting, the vacancies met with to be noted, and the number entered in the column for remarks.

Measures to be taken for permanently marking off the rows immediately they have been decided on.

The plants to be examined half-yearly or yearly, as may be thought desirable, and the result entered in the form given in the following page. In the first set of tables drawn up, a number of the columns would necessarily be vacant. There should be a separate table for each hundred plants of each year's planting: A for those of one part, B for those of another, and the same for each species. *Succirubra* and *Calisaya* the only two now to be grown. Plantings of future years to be similarly dealt with.

Further propagation by "cuttings" or "seed" to be kept an exact account of.

Depth of sub-soil to be taken in two or three different places on the ground covered by each hundred plants.

Under the plan suggested, there having been no planting in 1865, the plants of *Succirubra* to be taken account of would be 1,200, and of *Calisaya* planted in 1868-69-70 would be 600; in all, 1,800. This seems a small number perhaps to represent the plantation, but it is thought it would be better to gather exact and carefully drawn up information regarding a few, than an account of a large number which might be less likely to be accurate. In going over the ground for the few, there would be an opportunity of gaining a good idea of the whole.

APPENDIX G.

Schedule to be used in the Periodical Cinchona Reports.

TABLE A OF THE YEAR 1864.

Cinchona Succirubra, date.

Number of plants.	Number diseased.	Number doubtful.	Casualties.		Height of each plant.	Increase.	Greatest growth.	Least growth.	Average growth.	Remaining.			Depth of subsoil from surface.	General Remarks.
			Death.	Otherwise.						Healthy.	Diseased.	Doubtful.		
100														

APPENDIX H ;

Being a memorandum of MR. C. B. CLARKE *on Appendix G.*

1. I DIFFER from the other members of the Commission merely on the details of the schedule in Appendix G which it is proposed to introduce.

The filling up that schedule involves, besides a record of well ascertainable facts, the numerical tabulation of several matters of opinion, concerning which no two gardeners now on the plantations agree; and it is, therefore, reported (in paragraph 12 of the report) that it is undesirable that the filling up of the schedule proposed in Appendix G should be entrusted to gardeners.

I believe, on the other hand, that the information really required may be safely obtained from the resident gardeners by adopting for the form of schedule an extension of the tables now in use.

I append a copy of the half-yearly report for 31st September 1870, in which the measurements of 75 trees are shown by tabular statement.

2. I should hardly have thought it necessary, on a point of detail, to have drawn up a minute in opposition to the other members of the Commission ; but the carrying out of these measurements will devolve on the superintendent of the plantations, and I feel that I cannot recommend a plan to Government in carrying out which I see so much difficulty. To examine as detailedly as proposed 1,800 trees scattered on a wide plantation will be a work of time : it will be a considerable journey from the inspection bungalow to each row of trees to be examined. Practically, it will not be found worth while to attempt to proceed with the work during wet hours. What is really necessitated by the report (paragraph 12) is, that Government should depute an officer to journey to Rungbee, at regular intervals of six months or twelve months' stay there, and carry out these measurements, all which I believe unnecessary for attaining the proposed object.

Under the scheme in Appendix G, 1,800 trees require to be examined. I estimate that in two years' time 3,000 trees would require to be tabulated, as there will probably be a third species of cinchona cultivated.

3. Turning to the details of the schedule in Appendix G—

There will be a difficulty in determining the " number of plants" for the reasons shewn in my minute in Appendix C.

There will be a difficulty in returning the " number diseased," as no two gardeners coincide about disease, and no definition of disease is suggested. This difficulty is meant to be provided against by the next heading of " doubtful ;" but the numbers obtained under this system of classification at six monthly intervals will be, in my opinion, of little value.

The cause of deaths is required to be ascertained in the next column. I expect the results obtained here will be of small value.

The tabulation of the plants left standing as healthy, diseased, doubtful, I do not expect to furnish valuable results; different men will estimate differently the plants. I do not say in any of these cases that an expression of opinion may not be valuable. I do not consider these points of opinion likely to be well represented by numerical tables.

On comparing Appendix C, my grounds for supposing it of no use to tabulate at two or three places the thickness of the vegetable soil will be at once inferred.

4. Speaking generally, I should be exceedingly sorry to attempt to fill up the schedule G for 100 plants on the plantation. I could not do it in a way that would be satisfactory to myself.

5. I suggest that a schedule of the annexed simple form be used :—

	Date of plating out.	Height on 1st April 1871.	Height on 1st October 1871.	Increase.	Decrease.	Remark on the condition of each plant.
		Ft. in.	Ft. in.	Inches.	Inches.	
1	1st March 1868	8 10	10 10	24	.....	Sound.
2	... ...	8 0	4 0	.....	48	Leader gone.
3	... ...	3 0	3 8	2	.....	Is over a large stone.
4	... ...	6 4	... ...	.....	76	Dead.
5	... ...	7 6	11 3	45	.....	Now sound.
6	... ...	5 6	6 0	6	.....	Sickly; in a swamp.
7	... ...	7 6	1 6	.....	72	Cut down for unhealthiness, and has thrown a shoot.
8	6th March 1868	6 4	10 0	44	.....	Sound.
9	... ...	9 6	2 0	.....	90	Cut in the course of thinning, and has thrown a shoot.
10	... ...	5 6	7 3	21	.....	Sound.
11	... ...	and so forth.				
12	... ...					

6. The rows selected for record will have a numbered stick at the base of each tree. When these have once been placed, it will, from the irregularity of the plantation, be utterly impossible to shift them to any other line.

All the facts required can then be left to the gardeners, for (as now) the superintendent without visiting the plantation at any particular month can test in a morning the whole six monthly record sufficiently.

7. The facts being thus ascertained, they should (as now) be printed *in extenso;* and it will be the duty of the superintendent to make such deductions and generalizations from them in his report as he thinks warranted. The average growth in height will be a most valuable deduction while the trees are small; but when the trees get any size, it is difficult to make. If the trees are thinned, the worst are cut down; so that by giving the average of the remainder an enormous growth appears: if the trees are not thinned, they are not given a fair chance of growth. [This difficulty applies now to the present measurement of *C. Calisaya.*]

8. The casualties that affect the trees are so varied, that I think a remark column is the only way of representing them.

So in the case of affections of the bark, which in some forms are very fatal to the whole of the branch above the affected part, it is a matter of opinion whether one of the more serious forms is a variety, or even a necessary consequence of another comparatively harmless form. But I do not think it is advisable to frame a schedule which shall introduce the tabulation of such matters, or with the object of refuting a particular theory regarding them. Provided a tree grows regularly several feet a year, I do not regard much such speculations; the tree will produce a satisfactory amount of bark, and, as a general rule, I do not fear trees dying which have been as yet growing well: if they meditate dying extensively, I expect them to stop growing first. The most serious forms of disease are those which cost a tree its leader, and the tabulation of heights only at once represents this sufficiently.

I therefore consider that after all tables showing growth contain essentially the information wanted, and without admixture of controvertible matter.

9. I quite agree in the concluding remarks of Dr. J. Campbell Brown's minute. I go further and question whether the record of a much smaller number of trees will not be as valuable as that of 1,800, which latter number affords poor ground for generalizing concerning 1,200,000 trees.

I think one row of 50 trees recorded in each year's plantation would answer the required purpose. It must be recollected that the preparation of these

statistics costs Government money; that lists of 50 for six years' plantation of *C. Succirubra* and three years' plantation of *C. Calisaya*, will occupy nine pages of printing, and that this number will rapdly increase. This will be exclusive of deductions, and may, I fear, be cumbrous. Indeed, in my original scheme, I proposed to examine lines of 25 only in each year's planting, but I substituted lines of 50 in trying to meet the views of the other members of the Commission.

10. The present Appendix H has been drawn up in extreme haste, in order not to delay the submission of the report.

Report on the cultivation of Cinchona at Darjeeling for the half-year ending 30th September 1870.

From C. B. CLARKE, ESQ., M.A., Officiating Superintendent, Botanic Garden, and in charge of Cinchona cultivation in Bengal, to the Officiating Secretary to the Government of Bengal, General Department,—(No. 226, dated Rungbee, Darjeeling, the 25th October 1870).

THE Government of Bengal having approved of the substitution of half-yearly for monthly reports of the cinchona plantations near Darjeeling, I beg leave to submit herewith the report for the six months ending 30th September 1870, which is intended to follow the report for the month of March 1870.

Report on the Cultivation of Cinchona at Darjeeling for the half-year ending 30th September 1870.

THE season has been unusually wet, the rain-fall having already (25th October) amounted at the inspection bungalow to 200 inches, whereas the total fall for the year averages 180 inches only. The health of the plantations of *C. Succirubra* and *C. Calisaya* has remained good, and their growth satisfactory, though somewhat less than that of the preceding year. But *C. Officinalis* has suffered more than during previous rainy seasons, and all hope must be abandoned that this species can be grown to an economic profit at Rungbee.

Taking the plantation called the 5th in the tabular report, which represents best the present centre of the plantations, it will appear that the average growth of the measured plants of *C. Calisaya* for the half-year has been 36 inches, and that of *C. Succirubra* 22 inches. The latter, from accidental circumstances in choice of the plants measured, is too low, and does not represent fairly the growth of plants of that age in that part of the plantation. The best plants of *C. Succirubra* and *C. Calisaya* have, within three years of planting out, surpassed 20 feet in height. No measurement is given of *C. Officinalis*. It may be said generally of the older plants, that some 40 per cent. perished during the last six months, and that those which survived did not grow. The number of plants of *C. Officinalis* has been by estimation reduced from 930,704 on 31st March 1870 to 440,000 on 30th September 1870; but it would be best, in any calculations regarding these plantations, to write off these 440,000 at once; for, though some of them may survive for years, there is no probability that any profitable result will ever be derived from them.

Throughout the *C. Officinalis* plantation below 4,500 feet level, *C. Succirubra* was planted in 1869, in order to utilize area kept clean at considerable expense. These young *C. Succirubra* promise exceedingly well.

The 164,615 plants of *C. Succirubra* planted out during the early part of the six months under report were required to fill up the 1,000 acres of that species as designed by Dr. T. Anderson. The 33,101 plants of *C. Officinalis* were put out at a higher level (5,000 feet) than before as an experiment.

By far the greater portion of the coolie labor is spent in scouring the young plantations during the rains. In order to ensure a sufficient supply of labor at this period, it is necessary (as in the surrounding tea plantations) to maintain the coolies during the year, so that, during the cold weather, it has been difficult to devise sufficient employment for them. The cold weather is the best time for planting out; and in accordance with Dr. T. Anderson's advice, it is proposed, during the ensuing cold season, to employ them in planting out *c. succirubra* in a rough way, on some portions of the reserve which are at too high a level for *c. calisaya* to thrive upon; and it is for this purpose that a considerable quantity of *c. succirubra* seed has been raised, put down at 500,000 (including some stock raised by cuttings) in the accompanying tabular statement.

C. Calisaya has set its seed very favorably during the last two months. This seed should ripen in the course of next spring; and it is hoped that in future the quantity of seed produced will be sufficient to enable the extension of *c. calisaya* in any quantity that may be thought desirable.

The usual tabular statements are appended.

Table shewing the Temperature at the different Plantations for the half-year ending 30th September 1870.

Plantations.		Mean maximum.	Mean minimum.	Mean temperature.	Remarks.
April 1870 ...	2nd plantation ..	.....	54·40	.....	
	4th ditto ...	.....	53·92	.....	
	Rishap ditto ...	84·80	61·30	73·05	
May „ ...	2nd plantation ...	.....	60·17	.....	
	4th ditto ...	.....	62·92	.....	
	Rishap ditto ...	88·67	68·19	78·43	
June „ ...	2nd plantation ...	.....	61·78	.....	
	4th ditto ...	.....	66·17	.....	
	Rishap ditto ...	84·16	69·80	76 98	
July „ ...	2nd plantation ...	.....	64 00	.....	
	4th ditto ...	.....	67·48	.....	
	Rishap ditto ...	81·37	70·68	76·03	
Aug. „ ...	2nd plantation ...	72·90	63·00	67·95	
	4th ditto ...	79·60	67·40	73·50	
	Rishap ditto ...	84·30	70·40	77·35	
Sept. „ ...	2nd plantation ...	71·80	60·80	66·30	
	4th ditto ...	80·28	65·53	72·95	
	Rishap ditto ...	83·40	69·00	76·20	

Table shewing the Maximum and Minimum Growth for the half-year ending 30th September 1870

NAMES OF SPECIES.	TEESTA.		RISHAP.	RUNGBEE.	
	First plantation.	Second plantation.	Third. plantation.	Fourth plantation.	Fifth. plantation.
C. succirubra ...	Not measured	Not measured	5 to 33 inches	21 to 32 inches	9 to 40 inches.
C. micrantha ...	Ditto ..	Ditto ...	18 to 28 „	28 to 37 „	24 to 44 „
C. calisaya ...	Ditto ...	Ditto ...	16 to 44 „	16 to 23 „	28 to 48 „

Table shewing the Number and Distribution of Cinchona Plants in the Government Plantations at Darjeeling on the 1st October 1870.

Names of species of Cinchona.	Number in permanent plantations.	Number of stock plants for propagation.	Number of seedlings or rooted cuttings in nursery beds for permanent plantations.	Number of rooted plants in cutting beds.	Number of cuttings made during the month.	Total number of plants, cuttings, and seedlings.
C. succirubra	1,219,715	20,000	120,000	260,000	120,000	1,739,715
C. calisaya	24,860	10,000	34,500	23,000	8,000	100,360
C. micrantha	29,667	None.	None.	None.	None.	29,667
C. officinalis and varieties ...	440,000	...	...	...	...	440,000
C. pahudiana	5,092	...	...	...	...	5,092
Total ...	1,719,334	30,000	154,500	283,000	128,000	2,314,834

RUNGBEE,
The 3rd October 1870.

J. GAMMIE,
Head Gardener in charge,
Cinchona Plantations, Darjeeling.

Table shewing the Growth of Cinchona in the Darjeeling Plantations during the six months ending 30th September 1870.

Names.	Number.	1st Plantation (Teesta), Altitude 900 feet.				2nd Plantation (Teesta), Altitude 450 feet.				3rd Plantation (Rishap), Altitude 2,000 feet.				4th Plantation (Rungbee), Altitude 3,332 feet.				5th Plantation (Rungbee), Altitude 2,556 feet.			
		Date of planting, 18	Height in inches on	Height on 1st	Growth during	Date of planting, 18	Height in inches on	Height on 1st	Growth during	Date of planting, 1867.	Height in inches on 1st January 1868.	Height on 1st April 1870.	Height on 1st October 1870.	Date of planting, 1864.	Height in inches when planted.	Height on 1st April 1870.	Height on 1st October 1870.	Date of planting 1864.	Height in inches when planted.	Height on 1st April 1870.	Growth during the 6 months.
C. Succirubra	1	...	...	...	...	...	...	...	...	29th March	29	120	159	29th July	5	159	187	15th Oct.	6	271	9
Ditto	2	...	...	...	...	...	...	...	...	,, ,,	30	145	172	,, ,,	6	145	169	,, ,,	10½	175	19
Ditto	3	...	...	...	...	...	...	...	...	,, ,,	37	129	161	,, ,,	7½	159	189	,, ,,	5½	194	13
Ditto	4	...	...	...	...	...	...	...	...	,, ,,	24	146	179	16th Oct.	10½	130	156	29th July	3	187	12
Ditto	5	...	...	...	...	...	...	...	...	,, ,,	37	158	166	29th July	4½	123	158	,, ,,	5½	201	12
Ditto	6	...	...	...	...	...	...	...	...	,, ,,	30	159	182	,, ,,	4½	92	115	,, ,,	3	204	36
Ditto	7	...	...	...	...	...	...	...	...	,, ,,	27	105	133	,, ,,	3½	103	130	,, ,,	5½	232	34
Ditto	8	...	...	...	...	...	...	...	...	,, ,,	30	152	176	,, ,,	2	136	157	,, ,,	3	196	40
Ditto	9	...	...	...	...	...	...	...	...	,, ,,	29	135	146	,, ,,	3	129	151	,, ,,	4½	226	74
Ditto	10	...	...	...	...	...	...	...	...	,, ,,	25	114	119	,, ,,	3	153	176	,, ,,	4	266	27
C. Micrantha	1	...	...	...	...	...	...	...	...	16th ,,	17	129	157	15th Oct.	9	165	202	,, ,,	5½	174	29
Ditto	2	...	...	...	...	...	...	...	...	,, ,,	19	137	162	29th July	6½	128	168	15th Oct.	6	198	24
Ditto	3	...	...	...	...	...	...	...	...	,, ,,	44	141	168	,, ,,	3	124	154	29th ,,	6	224	44
Ditto	4	...	...	...	...	...	...	...	...	,, ,,	46½	149	169	,, ,,	2½	123	155	29th ,,	6	197	25
Ditto	5	...	...	...	...	...	...	...	...	,, ,,	55½	157	175	15th ,,	3	119	147	15th ,,	5½	198	27
C. Calisaya	1	...	...	...	...	...	...	...	...	29th June	25	136	180	29th June 1867.	15½	81	96	1st Jan. 1868.	2	82	30
Ditto	2	...	...	...	...	...	...	...	...	,, ,,	16	137	155	,, ,,	9½	78	101	,, ,,	3½	83	39
Ditto	3	...	...	...	...	...	...	...	...	,, ,,	15	136	164	,, ,,	12½	78	94	,, ,,	3½	84	34
Ditto	4	...	...	...	...	...	...	...	...	,, ,,	16	126	142	,, ,,	10	73	91	,, ,,	3½	88	38
Ditto	5	...	...	...	...	...	...	...	...	,, ,,	22	129	146	,, ,,	11½	85	105	,, ,,	1½	75	48
Ditto	6	...	...	...	...	...	...	...	...	,, ,,	24	138	162	,, ,,	10½	92	115	,, ,,	4½	91	32
Ditto	7	...	...	...	...	...	...	...	...	,, ,,	23	138	169	,, ,,	10½	83	102	,, ,,	4	89	29
Ditto	8	...	...	...	...	...	...	...	...	,, ,,	19	130	159	,, ,,	15½	91	114	,, ,,	2½	105	28
Ditto	9	...	...	...	...	...	...	...	...	,, ,,	21	129	156	,, ,,	14½	69	91	,, ,,	7	101	40
Ditto	10	...	...	...	...	...	...	...	...	,, ,,	21	138	168	,, ,,	16	94	118	,, ,,	3½	92	28

(Signed) C. B. CLARKE,
Supdt. Botanical Gardens,
and in charge of Cinchona Cultivation in Bengal.

RUNGBEE;
The 3rd October 1870.

From A. O. HUME, ESQ., C. B. Secretary to the Government of India, Department of Agriculture, Revenue and Commerce, to the Secretary to the Government of Bengal,—No. 18, dated Simla, the 29th June 1871.

I AM directed to acknowledge the receipt of your letter, addressed to the Government of India in the Home Department, No. 1309, dated the 8th ultimo, submitting the report of the Commission appointed to enquire into the cultivation of cinchona in British Sikkim and divers questions connected therewith.

2. I am desired, in reply, to state that the Governor General in Council entirely approves of the orders on the report already issued by the Lieutenant-Governor, and I am to request that the following remarks on the cultivation of the plant, the export of the bark to England, and the local manufacture of alkaloids, may receive His Honor's consideration.

3. As regards the first point, *viz.*, the cultivation, it seems clearly proved that *c. officinalis* is unsuited to the soil and climate of the Government Plantations in Sikkim. It has been tried at various elevations without making any progress, and its extended cultivation would be unprofitable. His Excellency in Council, therefore, agrees in the recommendation of the Commission that its further popagation should cease. All the plants now standing should be cleared away, with the exception of those which it may be desired to retain for the supply of seeds, or for other sufficient reason. It seems advisable that vigorous efforts should be made to propagate *c. calisaya* and *c. pitayensis*, which species yield a larger quantity of crystallisable alkaloid than *c. succirubra*, and which have a greater marketable value in Europe. The officers in charge of the gardens should also be directed to exert themselves to obtain for trial any other species or varieties, the yield of which in alkaloids appears likely to be superior to that of *c. succirubra*. At the same time it is not intended that the further cultivation of this latter species should be interrupted. On the contrary, all healthy seedlings and cuttings now in stock should be planted out, and further supplies of plants should still continue to be raised from seed taken from sound and healthy trees. In connection with the subject of this paragraph, I am to invite the attention of the Lieutenant-Governor to paragraph 4 of the despatch* from the Secretary of State, copy of which is forwarded herewith.

* No. 28, dated 4th April 1871.

4. His Excellency in Council is not disposed without further experiment and more careful enquiry to concur in the opinion expressed by Mr. McIvor regarding the destructive nature of the disease which has attacked some of the plants at Rungbee—a disease which is shown to have existed in the plants originally sent up from the Neilgherries as stock for the Sikkim Plantations. Disease doubtless exists, and, unless care is taken, the results may prove serious, but there appears to be no valid reason for apprehending anything like the general failure predicted by Mr. McIvor; nay more, the Governor General in Council hopes to hear that in the new plantations stocked from healthy *seedling* plants, the disease will occur more rarely, and there is reason to expect that even in the older plantations it is gradually disappearing; and that the opinion of the Commission, that the vast majority of the plants are likely to last at least seven or eight years, will prove to be well within the facts. In order, however, that one test may be applied to the different opinions expressed on this point—a test which will be peculiarly valuable as being founded on that portion of the plantation where the disease is likely to be most extensive and persistent—His Excellency in Council would be glad if His Honor the Lieutenant-Governor would be good enough to issue orders that, of the 140 trees which still remain untouched from among those planted out in 1864, none may be cut unless it should be found absolutely necessary to thin them; and that a half yearly report may be submitted showing the progress and condition of these trees, whether disease is increasing among them or not, and any other particulars of interest regarding them.

5. The Governor General in Council concurs in the Lieutenant-Governor's decision regarding the export of bark. For some years to come the only possible method of keeping a check on expenditure, and of ascertaining the real commercial value of this experiment, will be to export annually a considerable proportion of the best bark produced, and sell it for the highest price it will fetch in the open market. I am to request further that His Honor will favor the Government of India with the earliest intimation of the financial results of the exportation now authorized in a statement exhibiting the estimated cost of production, the actual cost of picking, drying, and packing the bark, the cost of transport to Calcutta, freight, shipping, and landing charges, brokerage, and other charges in England, and *per contrá*, the price realised.

6. In regard to the remaining point, local manufacture, His Excellency in Council would be glad to be informed of the results of the enquiries being made by His Honor for a skilled and competent person to undertake the execution of systematic experiments at Rungbee.

7. The Governor General in Council is desirous that these experiments may be proceeded with energetically, and that the process advocated by Dr. Simpson, as well as that of Mr. Broughton, may receive full and fair trial, and their respective merits be accurately weighed. Mr. Broughton's process, which is already in operation at Rungbee, should receive further trial under skilled supervision, and Mr. Gammie, the Head Gardener in charge, might be directed to prepare a considerable quantity of alcohol from hill maize, in order to ascertain what it costs when made on an extensive scale. In the trial of Dr. Simpson's and Mr. Broughton's process, a quantity of, say, 2,000lbs. of fresh bark might be carefully worked up under each system, and an accurate comparison of the cost and results in each case instituted.

* * * * * * *

9. As regards the supposed discouragement of private enterprise which the Darjeeling Cinchona Association seem to believe involved in any further extensions of the Government Plantations, I am desired to remark that in this as in similar cases of the introduction of exotic staples, the first step towards enlisting the active co-operation of private capitalists generally is to prove by actual operations on a large scale that their cultivation will really be remunerative. Until this has been done, no efforts that the Government may make to establish that cultivation thoroughly can, if rightly considered, be held to affect private enterprise injuriously.

10. Considered only in the light of this broad principle generally applicable to the cases of exotic staples, it is manifest that the time has not yet come for Government to relax its exertions in the matter of cinchona cultivation. These very papers show that two of the most practised experts in chinchona are of opinion that the Sikkim Plantations are dying rapidly out, and will, in a few years, be altogether extinct. His Excellency concurs with the Commission in considering these gentlemen in error; but should their conjectures unhappily prove well-founded, the Government would probably select other sites and open out other plantations,—in a word, would persevere until cinchona cultivation was a success, and until it had secured for the fever-stricken millions of India the inestimable blessing of cheap quinine.

11. Unfortunately the field is too wide to be adequately occupied for many years to come either by Government or private individuals, or both, let both labour as they may. From the first Government has encouraged, and will always encourage, private plantations. Seeds and plants it freely gives, and throws open to inspection its own plantations, and does its utmost to make available to all the experience gained in the work by its own officers; but the Government feels that it could not, without the abnegation of a vitally important duty, leave solely to private enterprise the further prosecution of those measures necessary to secure to the people abundant and cheap supplies of the "only efficient specific for the most deadly of all Indian maladies."

* * * * * * *

14. I am finally desired to state that the Governor General in Council appreciates the satisfactory manner in which the President and Members of the Commission have discharged the important duty confided to them.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

ACCOUNT AND AUDIT OFFICES OF THE OUDH AND ROHILKHUND RAILWAY.

Extract paragraphs 1 *to* 5 *and* 16 *of the Report by* CAPTAIN A. J. FILGATE, R. E., *Assistant Accountant General, Public Works Department, on the Account and Audit Offices of the Oudh and Rohilkhund Railway.*

SINCE I last inspected the Account and Audit Offices of this Railway, a complete change has been made in the manner in which the audit is conducted. Instead of having an audit carried out by a staff appointed by the Company, with an Examiner under the Consulting Engineer to check his work on behalf of Government, about the commencement of last year, with the consent of the Secretary of State and the Board of Directors, the appointment of a joint Auditor nominated by Government to carry out a combined audit of the transactions of the Railway on behalf of Government and the shareholders was sanctioned. The original idea of starting a combined audit was put forward by General Beadle shortly after his return to India as Agent of the Company; and although the proposition was not favorably received at first, after due consideration it was fully accepted by the Government of India. I am now bound to state that the joint audit appears to be a complete success in every respect, and to work with little or no friction.

2. The trial that the combined system of audit has undergone during the first year of its existence is more than sufficient to test its qualities to the fullest extent; for the work of construction during the period named has been pushed on over some 550 miles of Railway as fast as circumstances would permit, and the Auditor has been in direct account with 31 disbursing officers scattered over this length. The fact that no complaints have been received against the system is alone a fair proof of its success; but the complete manner in which the audit has been conducted to the satisfaction of the officers of Government and the Company places the matter beyond doubt.

3. The main features of the system are, that the accounts of Disbursers are submitted direct to the Auditor, who exercises a complete check over the outlay and forwards to the Company's Account Office the necessary information on which to base the entries in the books, and that no payments are made without the certificate of the Auditor as to their correctness.

4. As an example of the present state of the accounts of Disbursers, I may mention that on the 27th March, when I examined the books, out of 31 Disbursers, 27 had sent in their accounts to the Head Office up to the 17th, and the accounts of 28 officers up to the 10th idem had been examined and passed by the Auditor. It would be a good thing if some of the older Companies could be got to work up to this state of punctuality.

5. It would be superfluous on my part to enter into a full description of the manner in which the details of the accounts and audit are carried out, as the procedure has been fully described in the circulars that have from time to time been issued on the subject during the past year; but I will simply remark that the rules laid down with the sanction of the Accountant General, Public Works Department, have been adhered to. I would, however, suggest that these circulars should be published in pamphlet form for convenience of reference, advantage being taken of the opportunity for correcting any points which experience may have shewn to require modification. The system of account and audit now in force is second to none on any Railway in India, and it would be a benefit to the Companies' officials, as well as those of other undertakings, to have the rules and forms in force recorded in a lasting form.

16. In concluding these remarks, I think it my duty to bring to the notice of Government the very satisfactory manner in which Mr. Macdonald has conducted the responsible duties entrusted to him. He was the first officer of Government to whom the novel process of conducting a joint audit on behalf of the two parties to a contract has been entrusted. The situation was one of no little difficulty and great responsibility, and it is very much to Mr. Macdonald's credit that he has met and overcome the difficulties in his path and earned the approval of the Government and Railway Officials. The great success of the system however must, I think, be due in no small degree to the hearty manner in which General Beadle has co-operated with the officers of Government in its introduction.

Extract paragraph 2 *of Public Works Department Resolution No.* 409 *A. R., dated* 28*th June* 1871.

2. The Governor General in Council is much pleased to learn that the new system of joint audit on behalf of the Government and the Railway Company has been conducted in such an efficient manner and has proved so successful.

GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Tuesday, the 27th June 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding*.
His Honour the Lieutenant-Governor of the Panjáb.
His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.
The Hon'ble John Strachey.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major-General the Hon'ble H. W. Norman, C. B.
The Hon'ble F. R. Cockerell.

PANJÁB REGULATIONS BILL.

The Hon'ble MR. STEPHEN moved for leave to introduce a Bill for declaring what laws are in force in the Panjáb. He said that the object of the Bill was to place the law of the Panjáb on a definite footing, which at present could not be said to be the case. Before 1861, it had been supposed that the Government of India had the same right to make laws for newly conquered provinces as Her Majesty had to make laws for Crown colonies, but doubt had subsequently been thrown on this opinion. In consequence of this doubt the 25th section of the Indian Councils' Act was passed, the effect of which was to confirm every "rule, law or regulation" previously made by the Governor General or the Lieutenant-Governor. The Government had since that Act proceeded on the supposition that it negatived by implication the existence of the power in question. When the Panjáb was annexed, however, the older opinion prevailed, and the Board of Administration to which the Government of the Province was entrusted, was accordingly intrusted by a despatch from the Government of India, with very wide discretionary powers for that purpose. Under those powers, as every one knew, the province was administered with exemplary vigour and perfect success. The Board of Administration naturally issued a large number of orders for the Government of the Province, and, amongst other things, directed their Officers and were themselves directed, to conform generally to the system of administration which prevailed at the time in the North-Western Provinces. The orders made by the Board, and afterwards by Lord Lawrence, first, as Chief Commissioner and then as Lieutenant-Governor, were in some cases confirmed as they stood; in other cases they were confirmed under qualifications; in others they formed the subject of a correspondence which led to no very definite result, but which was afterwards indirectly referred to, possibly in reference to other Provinces. In other cases Lord Lawrence had occasion to refer to particular regulations in force in the North-West. These references were usually made in very general terms, as was natural and inevitable under the circumstances, and without any thought on the part of Lord Lawrence, or apparently on the part

of the Government of India, that these references amounted to legislation. This state of things went on from 1849 to 1861, when the section of the Indian Councils' Act already referred to was passed. Its authors would appear to have known vaguely that a great mass of matter of the nature already described had practically the force of law in the Panjáb, though they did not know specifically what was its nature. Such as it was, however, it was all converted into law by the enactment in question, and to this day it formed an unknown and unexplored region with which it was simply impossible for any one to acquaint himself who had not access to the archives of the Panjáb Government, and the industry and time to master their contents. It was highly undesirable to allow an undefined mass of rules and regulations, about the legal validity of which no one could be sure, to constitute a portion of the law of the province. These rules and regulations owed their existence to the necessity under which the Government of India was placed of providing forthwith for the administration of a newly-conquered province. The measures for this purpose had to be taken at once, and there was no time for simplicity and brevity. Moreover, at the time the general law of India was such, that it was natural for the Government to shrink from extending it to such a province as the Panjáb. Great as were the merits of the Regulations, they were intricate in many parts and difficult to understand. An idea as to the condition of the criminal law might be gained from a perusal of Beaufort's Digest—a work of great merit which showed the existence before the Penal Code of a more intricate and troublesome state of the Criminal Law than existed even in England. The Government did not like to burthen the official staff with so cumbrous and perplexing a system, but having no better system to give them, it was reduced to the necessity of directing in substance that the Board of Administration should introduce and act upon it as far as they found it suitable. It was usually supposed that the Panjáb had been governed, as the phrase was, patriarchally without any law at all, and at the discretion of Lord Lawrence and his colleagues. It was impossible to make a greater mistake. Lord Lawrence and his colleagues no doubt possessed great powers. It was most fortunate for the Province that they did, and that they used them with corresponding vigour, but it was by no means true that they ruled without law. On the contrary, one of their very earliest measures was to provide themselves with codes of laws which, if not so complete as the Penal Code and the Codes of Procedure, were an immense improvement on the intricate system which prevailed elsewhere in India. The book called the Panjáb Civil Code was prepared as early as 1853, and many rules relating to Civil and Criminal Procedure were introduced somewhat later. So far, indeed, was it from being true that the great authority of Lord Lawrence could be quoted in favour of personal government as against government by law, that it would be much more like the truth to say that Lord Lawrence's administration of the Panjáb afforded the clearest proof that could be given, not only of the necessity of having laws to govern by, but of the superiority of simple and scientific laws over cumbrous ones. His attempts, however, to introduce such a system met with very partial success. No doubt the laws which he introduced were, from a merely legal point of view, defective in many particulars. It would have been a miracle if this had not been the case, but the collection of rules now published showed conclusively that no man could have recognized more explicitly the necessity of introducing into the Panjáb broad, simple, definite and tangible express laws, or could have made greater efforts to obtain them. As was before observed, there was produced in 1853 the first draft of what was subsequently published as the Panjáb Civil Code. This was an attempt, and an exceedingly able attempt, at codification, and anticipated corresponding attempts that had been made in other parts of India. This volume was sanctioned as a text-book, and some portions of it relating to procedure undoubtedly acquired the force of law. But the Government of India had shrunk from the task of laying down a definite code for the Panjáb, and had continued to sanction

or discuss the special orders and suggestions made from time to time by the Local Government. The consequence was that things had gone on till they had reached their present strange condition. One instance of the strange way in which laws had come into existence was the revenue system of the province. The original letter of the Government of India to the Board of Administration had directed the four short circulars, which regulated this subject in the North-Western Provinces, to be taken as the guide on revenue operations. The language of this letter was that of an ordinary despatch; but it had all acquired the force of law. The result was this: the four letters referred to were immediately afterwards embodied in the Directions to Settlement Officers—a beautifully lucid and simple set of instructions. These Directions referred to and relied upon the Regulations, and in this way the Revenue Regulations had come into force in the Panjáb; in fact, the law was introduced by a circular professedly issued under the law. This was one instance of the extraordinary confusion that had been produced; another was the Panjáb Civil Code. When leave to publish it as law was asked, the Government of India had distinctly refused, and directed that it should be published with the authority attaching to the circulars of the Sadr Court. However, its introduction into Oudh was subsequently recommended by the Governor General, and in his recommendation he observed, in passing, that it had been found very useful in the Panjáb. This had, somewhat strangely, in Mr. Stephen's opinion, been regarded by the Privy Council as an admission on the part of Government that the volume had acquired the force of law in the Panjáb. The question as to how far this was the case had been much debated; and Mr. Barkley, to whose labours they were all much indebted, had, in the course of a very careful investigation, discovered a remark which appeared to be the most distinct recognition of the Panjáb Civil Code, on the part of Government that was ever made. But it laboured under the disadvantages of being equivocal, unknown to every one whom it concerned, and of being obviously made without the least intention on the part of the person who made it to legislate. The remark was as follows:—The Lieutenant-Governor in reviewing the Judicial Commissioner's Administration Report for 1858, observed—'His Honor's assent is fully given to your remarks concerning the necessity and importance of exacting a strict adherence to the letter and spirit of the Panjáb Law and Procedure.'

The Council would probably agree with him in thinking that if a law was to be considered to have come into existence because the Lieutenant-Governor in the course of official correspondence, with no idea of legislation present to his mind, made an incidental remark, which was fished up years afterwards by an industrious official, any one who managed to know what the law was, must be uncommonly fortunate.

It was now proposed that this state of things should cease. Lists of the rules and circulars confirmed by the Indian Councils' Act had been called for by his (Mr. Stephen's) predecessor from all parts of India concerned, and the result, so far as the Panjáb was concerned, was the present volume by Mr. Barkley, which contained all which that gentleman, after a very careful enquiry, considered to be law in the Panjáb. The question was now how to deal with it. Mr. Barkley had forwarded a memorandum which he (Mr. Stephen) was happy to find coincided in all substantial particulars with one which had already been drawn up by himself. There would, he believed, be no difficulty in reducing the whole volume into an Act of perhaps fifty sections; and when this Act was passed, there would be an end of all non-regulation law. Two principles must, however, be kept in view in the framing of any such Act: in the first place, a large portion of the book could not be regarded as law in any sense of the word. It consisted of mere executive orders which Government was quite competent to enforce on its officials without legislation on the subject. As

to these orders, not only was it unnecessary that they should have the force of law, but it was highly inconvenient that there should be any doubt whether they had it or not, inasmuch as, if they had it, Government became bound by them and could not vary them at convenience. In the next place, there were a number of topics as to which it was highly desirable that the Local Government should have power to frame rules; such subjects were the existing track law, the slaughter of kine—a subject which, as recent experience unhappily proved, was eminently likely to provoke animosities between Mussulmans and Sikhs, and required, therefore, to be provided for by special rules. Then there were rules as to armed retainers and grazing rights. Now, if the portion of the book which consisted of alterations in the ordinary law were expressly enacted, if the portion which consisted of mere executive orders were put aside, and power were given to the Local Government to issue rules on the subjects just enumerated, he believed that the rules contained in the book might be safely repealed; and the result would be to get rid of that large mass of non-regulation law which, till now, it had been so difficult to ascertain or define. There would also have to be a section to declare what the law was according to which the Courts were to frame their decisions. It would follow the precedents set by the Bengal Regulations, and would refer to the Acts and Regulations in force in the Panjáb, to the Muhammadan and Hindú laws in the cases to which they respectively applied, and where no other law was available, to justice, equity and good conscience, which was in practice a less vague expression than it might appear to be. What would be done, accordingly, would practically amount to this: such portions of the Panjáb Civil Code as were not mere expositions of Muhammadan or Hindú law, would be re-enacted, except when it was considered unnecessary or undesirable. In some instances, the Panjáb Civil Code deviated considerably from the existing law, particularly in the case of pre-emption, the effect of custom, and insolvency. Upon the subject of the validity of the rules as to insolvency involving the administration of many lákhs of rupees, a difference of opinion existed, MR. STEPHEN understood, between the Judges of the Chief Court. As to this controversy, it appeared that the best thing to do was to leave it undecided as regarded the past, to set up everything which had been done heretofore on the assumption of the Panjáb Civil Code having the force of law, and, for the future, to lay down in clear and intelligible language what the law was which the Courts were bound to administer.

His Honour the LIEUTENANT-GOVERNOR said that he did not intend offering any commentary on the statement that his hon'ble friend had just made, but he could not but express the satisfaction which he felt that this troublesome and intricate matter was now to be dealt with. There could be no doubt that the effect of the Indian Councils' Act had been to make a great many things law that could not be regarded as law without a great deal of inconvenience alike to the Government and the people, and he sincerely rejoiced that the matter had fallen into hands so competent as to deal with it in a wise and statesmanlike manner.

The Motion was put and agreed to.

EUROPEAN VAGRANCY ACT AMENDMENT BILL.

The Hon'ble MR. STEPHEN also moved for leave to introduce a Bill to amend the European Vagrancy Act, 1869. He stated that the Government of Bengal had requested that the European Vagrancy Act should be amended with a view to meeting the case of persons coming from Australia in charge of horses, on engagements which terminated with the voyage, and immediately becoming chargeable as vagrants. In these cases it was impossible to enforce the Act, inasmuch as the persons "to serve whom" the vagrant had come to this country, was the shipper of the horses in Australia. As this was an obvious evasion of the law, it was proposed, by the present Bill, to make the consignee in such cases liable for the expenses of the vagrant.

The Motion was put and agreed to.

The Council adjourned to Tuesday, the 4th July 1871.

H. S. CUNNINGHAM,
Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

SIMLA;
The 27th June 1871.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., cap. 67.

The Council met at Simla on Tuesday, the 4th July 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding.*
His Honour the Lieutenant-Governor of the Panjáb.
His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.
The Hon'ble John Strachey.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major-General the Hon'ble H. W. Norman, C. B.
The Hon'ble F. R. Cockerell.

OUDH REGULATIONS BILL.

The Hon'ble MR. COCKERELL moved for leave to introduce a Bill for declaring what laws are in force in Oudh. He said, this measure was a part of the general scheme described at the last meeting of this Council, for removing all ambiguity as to the legal effect of section twenty-five of the Indian Councils' Act of 1861, in the determination of the law in force in the non-regulation territories.

After the exhaustive remarks of his hon'ble and learned friend (Mr. Stephen) on that occasion, it was hardly necessary for him to enter into any explanation of the need for legislation of this kind.

Although, in the case of Oudh, the subject was not so complicated as it had been shown to be in that of the Panjáb, by reason of the comparatively short period intervening between the annexation, or rather the re-occupation, of Oudh and the date of the Indian Councils' Act, and the consequently small number of orders to be dealt with, yet there also the advantage of a simple declaration of what must be deemed to constitute the law of the province would, he thought, be generally acknowledged.

The task of sifting the various orders of Government during that period and distinguishing between those properly having the force of law, and those of a purely executive character, was entrusted to a committee of officers of local

experience of which the present Judicial Commissioner was the President. The Committee's selection of orders having the force of law was described in their report to have been guided by an opinion of the Advocate General of Bengal expressed in a letter to the Government of India, dated the 13th September 1864, to the following effect:—

"I am clearly of opinion that the rules, laws and regulations referred to in section twenty-five are such as if passed for the regulation provinces since the 22nd April 1834, must have been passed by the Council of the Governor General in its legislative capacity. * *

"I think it is clear that the section must be read as applicable to such rules and regulations as were in the nature of laws affecting rights or imposing punishments, and that any rules or orders which in their nature were only rules for the guidance of a department or for the action of the executive, and which could be, and always have been, issued by the Government in its executive capacity merely, do not come within the section."

The result of the Committee's action on this principle was condensed in a volume of extremely moderate dimensions, as compared with that exhibited to the Council in connection with the similar Bill for the Panjáb. The collection of orders and rules which that volume contained commenced with the Government letter of the 4th February 1856, which laid down in the most comprehensive manner the rules which were to govern every department of the administration of the province at the time of its annexation to British India. Much of those rules had since been superseded by the introduction of the Codes; but some of considerable importance survived.

For example, the reference in somewhat loose and general terms to the Panjáb Civil Code contained in these orders had been held by the Privy Council to render obligatory the adoption of the principles of the Code as the basis of the administration of justice in Oudh. The extent to which these principles were to be applied, as also the degree of permanence intended to be given to their operation, must, he thought, be considered extremely doubtful; for in the letter of Government, to which he had referred, occurred the following passages:—

" But it will not escape your observation that, in the preparation of the rules under notice, much attention has been given to the *lex loci*, and that, specially in matters relating to inheritance, marriage, divorce and adultery, adoption, wills, legacies and partitions as well as in all commercial transactions, a due regard to local usage has been enjoined. It cannot of course be supposed that the *lex loci* or local custom in provinces differing so widely as the Panjáb and Oudh is in all or even in many respects identical, and it follows that those provisions of the rules, which rest on the *lex loci* in the Panjáb, cannot with any propriety, or without risk of injurious failure, be extended to the province of Oudh.

"While then the Governor General in Council directs your attention to this collection of principles of law as calculated to afford material assistance in the absence of any better or more appropriate treatise, he refrains from requiring the strict observance of them, until it can be ascertained how far they are applicable to the peculiarities of the province and the customs of its people. With this end in view, His Lordship in Council desires me to suggest that all the Commissioners and District Officers and the most experienced of the Assistants, should be required to study the principles of law in their daily application to the business brought before the Civil Courts, and after the lapse of a twelve-month or more, as may be hereafter determined, to report to the Judicial Commissioner the opinions which they may have formed to the applicability of the 'rules of law to the people of Oudh,' and to offer at the same time any remarks and suggestions which may have occurred to them."

Within a little more than a year after the promulgation of these directions, the whole province was reduced to a state of anarchy by the mutiny of 1857, and it appeared from the subsequent letter of Government, dated 6th October 1858, that no such report was made up to that date. From the absence of any reference to the matter in the Committee's report, it was to be inferred that no such investigation of the subject, as was contemplated by the orders of Government, had ever been made up to the present time.

It would clearly be necessary to restrict the operation of the principles contained in the Code to the extent to which they might be found to be consonant to the practice of the Oudh Courts during the last twelve years. This was the only question connected with the framing of the Bill, which he was

now asking leave to introduce, which presented any difficulty. The rest was very simple. There were certain rules of procedure in force in the Panjáb which were applied to Oudh by the orders of Government, dated 20th January 1859. There was a circular letter based upon an order of Government in regard to the record of rights of sub-proprietors and middle-men. The rules regarding such rights had been superseded for the most part by the enactment of Act XXVI of 1866. The only object in declaring them to have the force of law, was to give validity to past proceedings. There was also a rule as to the award of a fixed percentage to the finder of hidden treasure, and an order in regard to the employment of juries in the adjudication of civil cases in Lucknow.

Some doubt appeared to exist as to the law of limitation of suits now in force in Oudh, and appended to the Committee's report was a rather long correspondence on the subject ranging over several years and terminating with no satisfactory solution of the question at issue. The importance of that question was, however, very much diminished by the recent enactment of a new limitation law which would come into force in Oudh, as elsewhere, about two years' hence. All that had to be done now, therefore, was to declare what must be considered to have been, and to be, the law on this subject until the new Act came into operation, and to provide for the legal validity of past proceedings so far as they were affected by this question.

It was thought, moreover—but on this subject some doubt was felt—that the system of registration of deeds heretofore in operation in Oudh had not the force of law. Here, again, all future difficulty was avoided by the application of the new Registration Act. It would seem, however, in any case to be immaterial whether the force of law was or was not conceded to the present system of registration in Oudh, for that system not only made no registration obligatory, but apparently did not give any prescribed superiority to the registered over the unregistered document.

One useful result of this scheme for declaring the law in force in our more recently acquired territories would be the effacement of all distinction between the so-called "regulation" and "non-regulation provinces." That distinction was purely nominal, for it would be found that every regulation that was still operative in the older was practically in force in the more recently acquired provinces. Indeed, in one sense the latter would appear to be more overlaid with regulation law than the former, for apart from the fact of the Indian Councils' Act of 1861 having given the force of law to a mass of rules and orders promulgated by the Executive Government, he found from the volumes which described the regulations in force in the Panjáb and Oudh—and he confessed that the discovery was rather mortifying, as he had taken great interest in the work of consolidation and replacement of the regulations by modern enactments—that, for the purposes of these provinces, the 'spirit' of old regulations decently buried and put away in the repealing schedules of the consolidation Acts by which they had been superseded, was held to have survived their corporeal extinction.

The only places to which the term "non-regulation" could now aptly be applied, were those districts and hill tracts along our frontiers which had been expressly placed beyond the pale of the mass of our laws, whose degree of civilization and material progress were better suited to the patriarchal, than the legal, system of administration.

The Hon'ble MR. STEPHEN merely wished to add one word to what had fallen from his hon'ble friend. He entirely concurred in the observations with which he had closed his speech. He would be sorry that it should be supposed that the process at present going on with regard to the law of this country was calculated to render it more intricate or difficult. On the contrary, it was a process of simplification, and its result would be to render the law less technical

and obscure. At present, in provinces like Oudh and the Panjáb, there was considerable difficulty in ascertaining what the law was; and in Burma, as had been pointed in a striking pamphlet by Mr. Broughton, the present Administrator General, the condition of things was such that, supposing it to be the interest of a sufficiently skilful lawyer to go into the matter, difficulties might ensue which it would be really extremely difficult to meet except by express legislation. In fact, when rules and orders, such as are called for by the necessities of a newly conquered province, were suddenly invested with the fixity of law, it was certain that, before long, complications and embarrassments would ensue, for which legislation was the only cure. It was on this account that the present measure, and others of a kindred nature, had become a matter of necessity.

The Motion was put and agreed to.

GENERAL REGULATIONS AND ACTS (DEHRÁ DÚN) BILL.

The Hon'ble MR. COCKERELL also presented the Report of the Select Committee on the Bill to bring the Dehrá Dún within the operation of the General Regulations and Acts.

The Council adjourned to Tuesday, the 11th July 1871.

H. S. CUNNINGHAM,

Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

SIMLA;
The 4th July 1871.

No. 26 of 1871.

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, JULY 15, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

Non-Subscribers to the GAZETTE *may receive the* SUPPLEMENT *separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.*

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA *is required by Law, of which it has been customary to publish in the* CALCUTTA GAZETTE, *will be included in the* SUPPLEMENT. *For such Orders and Notifications the body of the* GAZETTE *must be looked to.*

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

REVIEW BY THE SANITARY COMMISSIONER WITH THE GOVERNMENT OF INDIA OF THE ANNUAL REPORTS OF THE LOCAL SANITARY COMMISSIONERS FOR THE YEAR 1869.

Extract from the Proceedings of the Government of India in the Department of Agriculture, Revenue, and Commerce (Sanitary),—Nos. 21-30, *dated Simla, the 6th July* 1871.

READ again a Circular Resolution of the Home Department, Nos. 241 to 250, dated the 6th July 1870, on the general review by the Sanitary Commissioner with the Government of India of the annual local sanitary reports for 1868.

Read a letter No. 309, dated 25th May 1871, from the Sanitary Commissioner with the Government of India, submitting a general review of the annual reports of the local Sanitary Commissioners for the year 1869.

RESOLUTION.—The Governor General in Council has read the review of the Sanitary Commissioner with the Government of India, with much interest, and directs that it be circulated for information and guidance to all Local Governments and Administrations.

2. His Excellency in Council desires that special attention be paid to the suggestions contained in paragraph 87 of the review, and that, in future, sanitary reports should be prepared according to the method therein described.

3. There has been great delay in the submission of the reports of the local Sanitary Commissioners, and the Governor General in Council desires that the several Local Governments and Administrations will insist upon their reports being submitted in future not later than the 1st of March of every year.

Government of Bengal,
" North-Western Provinces.
" Punjab.
Chief Commissoner of Oudh.
" " Central Provinces.
" " British Burmah.
Resident, Hyderabad.

ORDER.—Ordered, that a copy of the foregoing Resolution, together with a copy of Dr. Cuningham's review for 1869, be forwarded to the Local Governments and Administrations noted in the margin for information and guidance.

Ordered also, that a copy be forwarded to the Governments of Madras and Bombay, with the suggestion that, in order to secure uniformity in the preparation of the sanitary reports, the plan described in paragaph 87 of the review may, if there is no objection, be adopted by the Sanitary Commissioners under those Governments.

Ordered also, that a copy of the above Resolution be forwarded to the Sanitary Commissioner with the Government of India for information, and with the remark that the Government of India will await the receipt of a further communication on the subject of a cholera map.

Ordered also, that a copy of the above Resolution, and a copy of Dr. Cuningham's review of the reports for 1869, be published in the *Gazette of India*.

(True Extract.)

J. GEOGHEGAN,
Under Secretary to the Govt. of India.

From J. M. CUNINGHAM, ESQ., M. D., Sanitary Commissioner with the Government of India, to the Secretary to the Government of India, Home Department,—No. 309, dated Simla, the 25th May 1871.

General Review of the Annual Reports of the local Sanitary Commissioners for 1869.
From Home Department, No. 364, dated the 27th September 1870.
To Home Department, No. 478, dated the 29th idem.

WITH reference to the correspondence noted in the margin, I have the honor to submit a general review of the Annual Reports of the local Sanitary Commissioners for the year 1869.

Several of these Reports were very late in submission.

2. These reports reached me in the following order and on the date which is noted opposite to each of them:

From	Berar,	13th June	1870.
"	Punjab,	11th October	"
"	Oudh,	22nd "	"
"	British Burmah,	"	"
"	Bengal,	11th November	"
"	N. W. Provinces,	30th "	"
"	Central Provinces,	2nd March	1871.

The delay was in a great measure caused by the great sickness and the many important matters which consequently demanded attention.

3. Although somewhat earlier of arrival than they were in the year previous, they all, with one exception, came too late to be of use in the preparation of my General Report for 1869. The year was characterized by unusual, sickness: cholera, small-pox, and fever were extremely prevalent over great portion of the country, and the matters which demanded investigation were therefore much more numerous and important than ordinary. In estimating the time occupied in the preparation and submission of the different reports, regard must be had to the manner in which these investigations have been conducted and recorded. For example, the Report of the Sanitary Commissioner of the Central Provinces did not reach this Office till the 2nd of March 1871; but it contains the results of a most painstaking enquiry into the great epidemic of cholera from which the people in these Provinces suffered so heavily in 1869, and this enquiry was in a great measure conducted during the early part of 1870, in the course of a tour through that part of the country whith had been chiefly affected.

It is very important that these reports should, in future, be submitted at a much earlier date.

4. But while making every allowance on account of the work which attends on the proper discharge of the duties of the Sanitary Commissioners, it is indispensable that their annual reports should be submitted at a much earlier date than hitherto. The statistics of sickness and mortality among the troops and prisoners cannot be considered with any degree of satisfaction apart from the history of disease among the people generally. All the information which can be procured from every source must be examined at one and the same time, and the Sanitary Commissioners will therefore, I trust, submit their annual reports in future in time to enable me to have the advantage of studying them in connection with the statistics of troops and prisoners, and so to prepare a full and complete report for the year regarding all sections of the community.

No general plan has been followed in these reports.

5. The division of their reports into certain sections which I recommended last year has not been followed by all the Sanitary Commissioners, nor, indeed, has it been fully adopted by any of them; but I shall endeavour, as far as possible, to keep to such an arrangement in this general review of their contents. And I would at the same time observe that if some such division as I have proposed, or any other which the Government may think best, were generally followed by all the local Sanitary Commissioners, it would greatly facilitate reference, and thereby materially aid not only in summarizing the facts collected from various sources, but also in drawing deductions from them.

Their contents will be considered under six heads.

6. I shall now proceed to consider the information which these reports contain as regards—

I.—Vital statistics.

II.—The history of each of the chief diseases as it affected the several Provinces during the year.

III.—The meteorology.

IV.—The general condition of the people as influenced by any deficiency in the crops, or by the unusually high price of food.

V.—The personal investigations and proceedings of the Sanitary Commissioners.

VI.—Sanitary progress during the year.

Any prominent facts contained in the Madras and Bombay reports for 1869 will at the same time be noticed.

7. Although the Madras and Bombay reports do not properly fall within this review, I shall take advantage to the opportunity of collecting from them any prominent facts which illustrate the history of disease or the sanitary condition of the people in those parts of India.

See I., Vital Statistics.

None are available regarding the Lower Provinces.

8. With the exception of a few statements regarding cholera in some Districts, and these are confessedly inaccurate and incomplete, the Sanitary Commissioner for Bengal gives no vital statistics for his Province. In his remarks on this most important question, Dr. Smith observes that it had been intended to commence mortuary registration from the 1st of November 1869, but that, owing to unforeseen difficulties, its introduction was postponed till the 1st July 1870. How far these arrangements have actually been carried into effect I am not aware; but, judging from the very imperfect information which is obtainable regarding cholera in the several Districts of the Lower Provinces during 1870, and during the past months of the current year, it would seem that the system is not yet in good working order.

The want of this information is a great loss, especially as regards the history of cholera.

9. Bengal Proper is the only Province of India from which no statistical information regarding the deaths among the people in any part of it during the year 1869 can be obtained. In the North-Western Provinces, the Punjab, Oudh, the Central Provinces, and Berar, a general system of mortuary registration has been for some time in operation. In British Burmah it has as yet been confined to 17 towns, but, with the single exception of Calcutta, no information can be obtained regarding the number of deaths among the people in any part of the Lower Provinces. The want of such data is a serious loss as regards the mortality attendant on all diseases, but the want is chiefly felt in connection with the history and geographical distribution of cholera. If the delta of the Ganges be the home of this disease, then every fact connected with its appearance within the limits of this endemic area, and with its progress beyond these limits, is of the greatest importance. But, in truth, without vital statistics the Sanitary Commissioner wants the foundation on which all his other work must be built. The supervision of the registration of deaths amongst so large a population and over so great an area as that of the Lower Provinces is undoubtedly no small work, but it is one which is of primary importance and which much demands attention.

10. The registration of deaths in the North-Western Provinces shows that 1869 was a year of very unusual sickness and mortality. All the great causes of death—cholera, small-pox, fevers, and bowel complaints—were very prevalent. The comparative results in different Districts as shown in the one general table which is given in the body of the report, appear to convey a tolerably correct estimate of the relative prevalence of these diseases, but the mortality must be greatly understated, and thousands of deaths must have escaped registration. The death-rates vary in different Districts from 5·8 per 1,000 in Bustee, a ratio which must be the result of very imperfect registration, to 56 per 1,000 in Jhansie, where famine and terrible sickness told heavily upon the people. The total death-rate of the Province is given as 17·9. The details which are furnished in Appendix A are manifestly incorrect. The new scheme of registration had not then come into force, and the particulars which have been given regarding the causes of death during the year, such as a "broken heart," "eating mud," and many others which might be instanced, are chiefly valuable as illustrating the necessity of a better system. During the last few months the standard forms have been brought into use, and the results of each month's registration are regularly published in the North-Western Provinces *Gazette*.

For the North-Western Provinces they are imperfect.

11. In the Punjab, where the importance of a good system of registration has from the first attracted the attention which it so justly deserves, the details are much more complete and bear the impress of greater accuracy than those of the North-Western Provinces. Much still remains to be done before the returns can be accepted as embodying more than an approximation to the truth, but, "lamentably imperfect," as they are still admitted to be by the Sanitary Commissioner, they are yet of great value, not only for the information which they contain regarding the general history of disease, but as the basis of more successful results. The death-rate for the Province was 26 per 1,000, varying from a minimum of 16, to a maximum of 38 in different Districts. In the towns, the statistics of which although included in the District tables are also shown separately, the death-rate equalled 35 per 1,000—a result which points rather to greater accuracy than any special mortality. In some of them the death-rate was extremely high. At Umritsur it was 69, at Delhi 46, at Sajanpore, in the Goordaspore District, 80, and at Dera Nanuk in the same District 84 per 1,000. A very important step has been taken in making the heads of families responsible for reporting all births and deaths. As a commencement this rule has been applied to only the principal station of each District (excepting Umballa and Abbottabad, which have for the present been omitted); but the Sanitary Commissioner recommends that it should be gradually extended as the people come to understand the uses and object of registration until at last the whole Province is included in its operation. The new standard forms for showing the results of registration had not been introduced. Some delay had occurred owing to a reference on the question of establishment required for the purpose, but monthly statements in the prescribed form now appear in the local Gazette. The statement which the Sanitary Commissioner has appended to his report afford much information, but it is very desirable that one and the same system should be adopted throughout India. Without this, comparison is almost impossible, and no satisfactory examination can be made of the returns from the different Provinces without an infinity of labor which may, to a great extent, be obviated by uniformity.

In the Punjab they are more complete and bear evidence of greater accuracy.

12. All the data regarding the deaths and causes of deaths in Oudh during the year 1869 are contained in one table in the body of the report. The deaths registered from all causes equalled 16·8 per 1,000, a ratio which, especially in a year of such great sickness, must be much under the truth. In different Districts it varied from 9·1 to 35·6 per 1,000. The information is very meagre and imperfect, nor is mention made of any measures which have been taken with a view of obtaining more reliable results. With the introduction of the new standard forms some improvement may be expected, but it does not appear whether arrangements have yet been made to adopt these forms or not. As yet no monthly statements have appeared in the local Gazette, in conformity with the instructions which have been issued by the Government of India.

The details from Oudh are meagre.

13. In the Central Provinces the proportion of the population under systematic registration in 1869 was much the same as in the year previous; but when cholera became prevalent, it was extended to the whole of the people with the exception of those in the feudatoryships and zemindarees which are not under the direct administration of the Government. It thus happens that while the information regarding the other great causes of deaths refer to 4,862,516, the details regarding cholera include 6,879,738. With the commencement of 1870 the new forms have been brought into use, and the whole of the inhabitants, with the exception of those in the zemindarees and in some of the more distant villages of the wilder Districts have been embraced in the registration. Dr. Townsend's Mortuary Tables for the year, although still confessedly imperfect, afford very valuable information and evince the care and attention which in the Central

In the Central Provinces, as in the Punjab, registration has received much attention.

Provinces as in the Punjab have been bestowed on the subject of registration. The total death-rate for the Province on the deaths registered was 35·9, varying from a minimum of 13·6 in the District of Seroncha to 61·1 in the District of Jubbulpore. In many of the towns the loss of life was terrible. In twenty-three of the forty-five, regarding which particulars are given separately, the ratio was over 40 per 1,000. In fifteen of the twenty-three it was over 50, and these fifteen again contain instances of mortality rising to 60, 70, 80, 90, 100, and in the case of Jubbulpore to 123 per 1,000.

14. Berar was taken from the Central Provinces and placed under a separate Sanitary Commissioner only on the 2nd of April 1870. The population under registration in 1869 amounted to 2,074,614 or nearly 93 per cent. of the whole people of the Province. The registered deaths give a ratio of 22·8 per 1,000 of the population. In the District of Woon it was only 14·9, in Oomraotee 30·4, and between these extremes there were varying rates of mortality. The standard forms, it is noted, were to have been brought into use in 1870. It is very desirable that the monthly results should be published for general information. In the absence of any local Gazette the statement might conveniently appear in the Gazette of the Central Provinces.

Berar was not placed under a separate Sanitary Commissioner until April 1870.

15. In British Burmah the registration of vital statistics had been introduced into only seventeen towns; but from the 1st July 1870, a system based on that laid down by the Supreme Government for the whole of India was to come into force. The Chief Commissioner trusted that, with care and attention on the part of District Officers, statistics for the whole Province would thereafter be obtained.

In British Burmah only 17 towns had been embraced in the registration.

16. The statements from Mysore relate to the official year 1869-70, and cannot, therefore, be compared with those of the other Provinces which embrace the year 1869. Moreover, the death-rate of about 8 per 1,000 which these statements show, as the Chief Commissioner remarks, cannot but be regarded as much too favorable, and many deaths must have been left unreported. From the 1st July 1870, the new system of registration was to be introduced, and it was hoped that more accurate results would then be obtained. The total population of Mysore, it may be noted is stated to be 4,056,766, of which the details are as follows:

Europeans	4,151
Eurasians	2,855
Native Christians	8,186
Mahomedans	189,272
Hindoos	3,839,679
Buddhists and Jains	12,623
Total ...	4,056,766

The returns from Mysore being for the official year are not comparable with the others.

17. The total population of the Madras Presidency is estimated at 26,097,021, and of these 24,633,127 had been included in the registration, the difference representing zemindaree tracts and remote villages from which it had not been found practicable to obtain returns. The returns show a total mortality of 18·3 per 1,000; but as the Sanitary Commissioner remarks, the deaths are in all probability much under-stated. The ratios vary in different Districts from 9·8 to 24 per 1,000. From the 1st July 1870, the standard forms were to be employed.

Registration in Madras and Bombay Presidencies.

The population under the Government of Bombay in 1869 is estimated at 13,901,868. A general statement is given for the year, and details regarding the civil population of each Collectorate. The total death-rate is estimated at 20·4 per 1,000. It does not appear what orders have been issued regarding the adoption of the new forms, but the Sanitary Commissioner observes that the attempt to obtain information regarding the causes of death, in even the most simple form, had hitherto failed; and it was feared that a general classification such as that adopted in the new statements, which is somewhat more complicated than that hitherto in use, could not be followed with accuracy.

18. In the annexed statement, the general results of mortuary registration are shown throughout British India:

The general mortuary statistics of India, so far as obtainable, are shown in the annexed table.

Statement showing the number of deaths registered in the various Provinces of British India during the year 1869.

PROVINCE.	Estimated population.	Population under registration.	NUMBER OF DEATHS FROM						Total deaths.	Ratio of deaths per 1,000.
			Small-pox.	Fevers.	Bowel Complaints.	Injuries.	All other causes.	Cholera.		
			No statistics.							
Bengal.	29,588,653	All	90,770	246,838	31,452	Not stated.	91,151	69,542	529,753	17·9
North-Western Provinces	17,448,865	,,	53,195	272,946	30,953	4,832	82,637	9,258	453,821	26·
Punjab	11,198,095	,,	21,564	87,795	6,235	3,200	46,446	23,134	188,374	16·8
Oudh	9,000,000	,,	16,849	68,999	12,550	1,725	23,438	51,337	174,998	35·9
Central Provinces	2,231,565	4,862,516	6,365	12,917	6,154	818	10,137	10,947	47,338	22·8
Berar	2,395,985	2,074,614	1,067	2,415	630	122	4,140	1,035	9,369	29·
British Burmah	26,097,021	322,728	17,448	132,346	Not stated separately.	9,445	271,708	21,034	451,981	18·3
Madras	13,901,863	24,633,127	19,673	Not stated separately.	Not stated separately.	4,719	Not stated separately.	52,365	283,878	20·4
Bombay		All								

19. The returns are still too imperfect to admit of any satisfactory analysis of their contents beyond what is here exhibited. The relative mortality among the rural as compared with the town population, the comparative death-rates at different ages and among the two sexes, as well as the proportion due to particular months and seasons, are all questions of very great interest, but no correct data are yet available for their consideration. It will be observed that the highest mortality 35·9 per 1,000, occurred in the Central Provinces, where the great epidemics of the year sufficiently account for the results. Next follows British Burmah, with a death-rate of 29 per 1,000, but the returns are collected from a very limited portion of the population. In the Punjab the ratio was 26, and in the other Provinces it varied from 22·8 in Berar to 16·8 in Oudh. Judging from the very unhealthy character of the year, the deaths in the North-Western Provinces, in Oudh, and also in Madras and Bombay, would appear to be much under-stated. As most of the Sanitary Commissioners remark, the errors in the registers are errors of omission, and had all the deaths been entered, the ratio for all the Provinces would doubtless have been more or less in excess of those which are here represented.

The statistics are not yet sufficiently accurate for any satisfactory analysis.

20. No mention has yet been made of the registration of births. In several of the Provinces, and especially in the Punjab, the Central Provinces and Oudh, attempts have been made to collect data on this important point; but the difficulties which attend such an attempt are very much greater even than those connected with the registration of deaths, and the results as yet are very imperfect.

The registration of births, though attempted in several of the Provinces, is very imperfect.

21. On a review of all that has yet been done to introduce a general system of a registration among the people of India, it must be admitted that the results of 1869, imperfect as they are, contain most important information, and encourage the hope that they will year by year improve and increase in value. The difficulties which have to be contended with in carrying out any such system in India are but little understood and appreciated by those who have had no experience of the country and whose ideas of registration are derived from what has been done in Great Britain. The vast area embraced in each Province, the millions of people to be included in the registration, the fact that in many Districts, each of which is larger than a county of England, and many of them as large as several counties put together, there is generally but one educated medical officer who could accurately certify to the cause of death in any case, and the want of proper machinery for registration are all obstacles of no small magnitude; and, regarding what has been effected in relation to these difficulties, I am rather astonished at what has been done than disappointed at the errors and omissions. The system is yet in its infancy; it is new to the people, and, until they in some degree understand its aim and objects, they will not render that willing assistance which is indispensable to its success. The special attention of the Sanitary Commissioner in every Province should be devoted to registration,—it is, as I may say, the backbone of their work, and, where it is neglected, the sanitary condition of the people can never improve and flourish. When the results of registration for 1870 come to be reviewed it is, therefore, to be hoped that no Province will be found without its vital statistics collected and compiled with the greatest care, and that all the Sanitary Commissioners will evince the same appreciation of the value of mortuary registration as has been shown by Dr. DeRenzy in the Punjab and by Dr. Townsend in the Central Provinces.

Considering the great difficulties which have to be encountered, the results of registration in 1869 are encouraging.

22. I shall now pass to a consideration of the diseases which chiefly contributed to the mortality of the year, and of these the first on the list, though not the most destructive in all the Provinces, is cholera. In nearly all of them cholera was extremely and unusually prevalent, and it would be impossible within the limits of any general review to enter fully into the history of this vast epidemic. Its main features have been already discussed by Dr. Bryden in connection with the views which he has expressed in his work on cholera—its geographical distribution and relation to natural influences. I shall only attempt to state shortly the most important facts which have been recorded by the Sanitary Commissioners in their respective reports, and shall then consider the opinions which they have based upon them. My object is not to urge any particular views with regard to the disease, but merely to examine the evidence which has been adduced and to ascertain how far any of the theoretical opinions which have been advanced in explanation of the facts of the epidemic are supported by this evidence.

Section II.—History of the chief diseases during the year.

A cholera was very prevalent in 1869.

23. As deaths were not registered in Bengal during 1869, no precise information can be obtained regarding the disease. The Sanitary Commissioner has summarized all the data which he could procure, but from several Districts no reports were received, and in none of them have the facts been so fully and carefully recorded as to embody any connected and complete history of the disease throughout the year. Without registration no such data can be obtained. So far as can be judged from the statements of the Civil Surgeons, cholera was severe in the

Very little information is to be had regarding its appearance in Bengal.

Bhaugulpore, Monghyr, Gya, Patna, Sarun, Tirhoot, and Chumparun Districts of Behar, and also in Assam. Some few instances are given in which the disease appears to have been spread by human intercourse, but the Sanitary Commissioner does not incline to the opinion that this was the agency by means of which it was disseminated. "It may be asked," he observes (page 43), "could quarantine operations of the most complete and perfect description have put a stop to the spread of cholera during the past year? I believe it would have failed to do so, because there is much evidence to show that the disease appeared simultaneously and independently in many places; because, in a large number of such instances, although special enquiries were instituted to the subject, importation could not by any means be traced, because in certain localities free communication with infected places went on without any manifestation of the disease occuring; and *lastly*, because its often sudden and simultaneous disappearance over broad tracts of country tends to prove its dependence on influences far other than those of mere human agency." Within the endemic limits of cholera, any investigation into the share which human intercourse may have in spreading the disease is beset with peculiar difficulties, but such facts as Dr. Smith here records are of great importance in the enquiry, and are well worthy of being recorded in detail. Without specific evidence as to dates and places and the number of cases or deaths, it is impossible to form any correct opinion with regard to them. No map has been furnished with this report to illustrate the distribution and comparative incidence of cholera in different parts of Bengal, but, in the absence of any statistics for the Province, it could not well have been prepared in such a way as to be of any real value.

In the North-Western Provinces the mortality from cholera was very heavy.

24. In the North-Western Provinces the mortality from cholera was very heavy; no less than 69,542 deaths are recorded under this head, or 2·3 per 1,000 of the population. The disease was, however, by no means equally distributed. The Districts of Lullutpore, Ghazeepore, Jaloun, Azimgurh, Jhansie, Mirzapore, Benares, Goruckpore, Humeerpore, and Bustee suffered most, the ratio varying from 10·9 in the first of them to 3· in the last. From three Districts—Kemaon, Gurhwal, and Turaie—no deaths from cholera were reported. In fourteen of them the mortality from this cause was under 1 per 1,000, and in the remaining eight it was from 1·3 to 2·8 per 1,000. In eighteen out of the thirty-five Districts of the Province, deaths from cholera were recorded in every month of the year. The statistics regarding the police, the accuracy of which can be relied on, shew that the force suffered most in those Districts in which the mortality among the general population has been recorded at the highest,—evidence which, as the Sanitary Commissioner's remarks shew, that, although the records of the general registration are inaccurate as regards the actual number of deaths, they are not altogether valueless, and contain a fair estimate of the relative incidence of the disease in different parts of the country. No map accompanies Dr. Planck's report.

The severity of the disease in the Punjab was confined to a few places.

25. With the exception of Muzuffergurh, every one of the thirty-two Districts in the Punjab suffered from cholera, but the severity of the disease was confined to a few places. In twenty-one of the Districts the mortality from this cause did not exceed 0·10 per 1,000, in seven of them it was above 0·10, but under 1·0 per 1,000. In the Kohat District it was 3·62, in Umritsur 4·33, and in Peshawur 5·99 per 1,000. On these last three the chief violence of the epidemic fell, but even this does not shew the remarkable localization of the severity of the outbreak; for the mortality, although shewn for the Districts as a whole, really fell chiefly, and in the case of Umritsur almost entirely, on the capital city: the rural population suffered little. Thus, in the Peshawur District as a whole, there were 2,985 deaths from cholera reported, but of these 1,480 occurred in the city. In the Umritsur District, out of 3,608 deaths, 3,041 were in the city. In the Kohat District, out of 508 deaths, 328 took place in the city and cantonment. Of the total of 9,258 deaths from cholera, it thus appears that no less than 7,101 occurred among the people of these three Districts, and of these again 4,849, or nearly five-sevenths, occurred among the people of the three cities. Some particulars are given regarding the outbreaks at these places, and also regarding the disease as it appeared at Lahore, Goordaspore, Jullundur, Hissar, Sirsa, Subathoo, Rawul Pindee, and Bunnoo. To attempt to state even the main facts regarding its history in all these Districts would be to recapitulate much of what Dr. DeRenzy has already so well described. Some of them must, however, be considered when I come to discuss the opinions which he has expressed with regard to them. Two maps illustrate the report,—one shewing the relative prevalence of cholera for the whole Province, and the other the details regarding the epidemic in the Peshawur Valley.

Particulars regarding the cholera in Oudh are wanting.

26. It appears from the general table already given that in Oudh 23,134 persons died of cholera during the year 1869, or a ratio of 2·0 per 1,000. The disease was epidemic over nearly the whole Province, but no particulars are given beyond the data which appear in the general table. The deaths varied from 0·09 per 1·000 in the Kheeree District to 6·1 in Rae Bareilly. No map accompanies the report, nor is there any record of the number of deaths which occurred in each month; but this last information was subsequently supplied at my request, and a table embodying it appeared in my Annual Report for 1869. There was a marked persistence of the disease throughout the Province, especially in the Districts of Fyzabad, Sultanpore, Seetapore, and Pertabgurh.

A very full account of the history of cholera in the Central Provinces has been given by Dr. Townsend.

27. The epidemic in the Central Provinces was made the subject of a most painstaking and careful enquiry: great part of the country which chiefly suffered was visited by Dr. Townsend, and the facts investigated on the spot. Out of a population of 6,879,738 to which the registration of the mortality from cholera was espicialiy extended, 57,079 deaths from this disease were recorded (Table No. 20). As shown in Table No. 18, out of a more limited population of 4,862,516, the deaths were 51,387, or 10·5 per 1,000. The severity of the disease fell chiefly on the people in the Mundla, Saugor, Dumoh, Belaspore, Raepore, and Nursingpore Districts, in which the mortality it occasioned varied from 21·3 in the first to 10·4 in the last. In Seroncha no deaths were reported. In the remaining twelve Districts the ratio of loss from cholera was from 9·9 in Wurdah to 0·4 in Chindwarra. In the town of Mundla the cholera death-rate was no less than 53·2, in Raepore it was 34·2. Many other towns suffered severely. From these facts it will be seen that the disease was both wide-spread and very fatal, very much more so than in any of the other Provinces. In 1868 it had also been severe in the Central Provinces, but the area over which it then appeared was more confined and the deaths numbered only 10,400 as compared with 57,079 in 1869. The excessive mortality in these two years may again be contrasted with the singular immunity which the people have enjoyed in 1870, when, throughout the whole Province, only 120 deaths from cholera have been registered. The details of certain outbreaks which are given by Dr. Townsend are of much interest. A map accompanies the report, and is of great assistance in studying the incidence and progress of the epidemic.

In Berar the disease was very generally diffused.

28. In Berar 10,947 deaths were ascribed to cholera during 1869, or 23·1 per cent. of the total mortality. The ratio of loss varied in the Districts from 4·7 in Bassim to 8·76 per 1,000 in Oomraotee, in the cities from 2·1 in Bassim to 8·4 in Akola. The epidemic was very generally diffused throughout the whole Province, but no very excessive mortality appears to have occurred in any one place. The Sanitary Commissioner, as I have already stated, did not assume charge till April 1870, and has been unable fully to detail the history of the outbreak, or to supply any map in illustration of his report.

The information from Burmah relates only to 17 towns.

29. As the statistics in British Burmah were confined to seventeen towns, the information regarding the general history of the disease throughout the province is incomplete. In all but four of them deaths were attributed to cholera, and in Akyab there was a severe outbreak to which 700 deaths were supposed to be due. No map accompanies the report.

The annexed statement shews the monthly mortality from cholera in each of the Provinces.

30. In the annexed statement, the extent of the mortality from cholera in each Province for each month of 1869 has been entered, and, for the purpose of comparison, the returns from Madras and Bombay have also been included. In the report of the Sanitary Commissioner for Bombay I have been unable to find a full detail of the deaths by months, but at page 197 he writes—"The season of greatest prevalence of cholera in 1869 was, during the three months—May, June, and July—during which considerably more than half the total fatal cases of the whole year occurred. The greatest number of reported deaths is in July, but the difference is trifling, the figures for the three months being 9,679, 9,525, and 9,764, respectively. December shows the lowest figure—275." In Madras the first maximum was in July, the disease then declined till October. In November in again rose, and in December it was nearly as fatal as it had been in July. In the North-Western Provinces and also in the Punjab the highest point was reached in August; till then it had gradually ascended, and from then it gradually diminished. In Oudh there was a first decided rise in June, a lull in July, and then a higher rise than ever in August. In the Central Provinces the mortality from cholera gradually rose during the first five months of the year. In June the deaths were nearly twice as numerous as in any other month, and then they steadily declined.

Statement showing the deaths from Cholera registered in the different Provinces in each month of 1869.

Provinces.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.*
Bengal Proper.	151	216	1,284	3,148	4,937	11,394	14,339	21,092	6,909	4,318	823	180	68,691
North-Western Provinces ...	18	32	51	76	144	194	797	3,238	2,391	2,033	204	80	9,258
Punjab ...	327	177	689	2,614	3,394	4,149	3,548	4,239	1,725	1,521	491	260	23,134
Oudh ...	70	134	749	1,837	9,799	22,823	12,977	7,050	2,127	391	16	6	57,079
Central Provinces ...	10	70	139	1,759	1,385	270	3,047	2,618	848	164	18	119	10,947
Berar ...	No statistics for months.					No statistics for months.							
British Burmah.	175	203	475	446	477	2,875	5,025	3,100	2424	1,907	2,198	4,067	23,072
Madras ...	No statistics for months.			...	...	...	...	...	...	...	...	...	52,365
Bombay ...													

* These totals do not in all cases agree with those given in the previous statement; but as the object of this table is to illustrate the comparative monthly incidence of the disease, the discrepancies are of little consequence.

31. I shall now proceed to discuss the opinions which have been expressed by the different Sanitary Commissioners with regard to this great epidemic as it affected their respective Provinces. The data from Bengal are so imperfect that no satisfactory conclusions can be drawn from them. Dr. Smith's views have already been cited in connection with the few facts which have been recorded, and no further reference need, therefore, be made to the disease as it appeared in this portion of the country. Taking the statistics of the North-Western Provinces for 1869, and considering the persistence with which cholera showed itself, appearing in not a few of the Districts in every month, and in others in nearly every month of the year, Dr. Planck is inclined to believe "that cholera is always to be found in some part or other of almost every District from one year's end to the other" (page 8). In the eastern Districts especially the general opinion seems to be that the disease is endemic, and the Sanitary Commissioner thinks it "not unjust to suppose that the permanent home of cholera is extending from east to west, and that, consequently, the people of the North-Western Provinces are more and more likely to have the disease amongst them in an epidemic form in coming years." "That the rapid means of communication now in existence are likely to increase this tendency," he adds, "I think there can be no doubt." With regard to the first of these statements, it is difficult to form any correct opinion, because there is no doubt that very many of the deaths which are ascribed to cholera, especially in non-epidemic years, are really due to other diseases such as bilious fevers. The second remark would seem to imply that Dr. Planck believes in human intercourse as the chief means of spreading cholera; but the facts which he has recorded regarding the epidemic in the North-Western Provinces during 1869 do not tend to this conclusion. Seven instances only are cited in which it was attributed to importation (paragraph 35). "In all other Districts, either satisfactory evidence of its importation is said to be wanting, or its importation denied." "As regards the spread of the disease by personal intercourse," he continues, "and the danger to friends or other persons attending on cholera cases, the evidence is reassuring. With the exception of Meerut and Boolundshuhur, the evidence from all the Districts is, that no facts have come to notice showing that the disease has been so spread, or that any unusual danger attends the ministering to cholera patients." His general opinion regarding the epidemic is thus recorded: "Concerning the cause of cholera or the mode of its distribution, nothing definite, so far as I know, has been recorded in the past year; even the belief that cholera is distributed by means of the water-supply has been, I think, a little distributed by a record of the fact that, wherever cholera prevailed those attacked and those who escaped drank from the same wells. These conclusions are of only a negative character, but it is very much better to confess ignorance than to advance theoretical opinions which cannot be substantiated by facts. It appears to me that in any future epidemic very searching investigation should be made into its history. It would be quite impossible for the Sanitary Commissioner to visit more than a very small portion of the Province during any one season,—for the great mass of information regarding the disease, he must be dependent on his mortuary statistics and the reports of the Civil Surgeons; but if one District or even part of a District in which cholera had been most prevalent and fatal in 1869 had been selected for careful enquiry in the cold weather of 1869-70, much valuable information might have been obtained. Dr. Planck is of opinion that the great measure required for the prevention of cholera is "the improved sanitation of the Province generally, and especially of the principal centres of population," and of the soundness of this conclusion there can be little doubt.

The opinions of the Sanitary Commissioner of the North-Western Provinces with regard to the epidemic are chiefly negative.

32. Dr. DeRenzy's views as to the mode in which cholera is spread over any Province, and the medium through which it generally attacks a community with special violence, are very decided. At page 101 of his report he states, with reference to the first of these questions, "a humid atmosphere is as incapable of transporting the cholera virus from place to place as it was of transporting the potatoe from its original habitat to Ireland, the cinchona to Darjeeling, or the tea plant to our own Kangra Valley. In these cases human agency was indispensable to the transfer; it is equally so in the case of the cholera virus." On the second point he writes (page 104),—"when it was demonstrated in London that of all the conditions which favor the propagation of cholera, *viz.*, exposure to infection, bad drains, crowding and defective ventilation, poverty, and the unclean habits which too often attend it, low damp residence, imperfect medical relief, and water tainted with cholera discharges,—the most influential was cholera tainted water, it was practically established that the same relative importance would attach to this condition in all other parts of the world." Dr. DeRenzy, in fact, adopts Dr. Snow's water theory "that the cholera poison is swallowed and acts directly on the mucous membrane of the intestines; is at the same time re-produced in the intestinal canal and passes out much increased in the discharges; and that these discharges afterwards in various ways, but chiefly by becoming mixed with the drinking water in rivers or wells reach the alimentary canals of other persons and produce the like disease in them."

The opinions of the Sanitary Commissioner of the Punjab are very decided.

33. I cannot admit the accuracy of Dr. DeRenzy's statement when he asserts that, in London, the spread of cholera was demonstrated to have been dependent on *cholera tainted* water, but it is not my purpose to enter into any general discussion regarding this or any other point connected with the disease. I shall merely consider how far the two decided opinions which he has advanced are supported by the history of the epidemic as it appeared in the Punjab in 1869. And first as to human intercourse. Neither as regards the city or jail of Umritsur is there any evidence of importation. "The prisoners had been carefully guarded by quarantine, and their employment outside the wall discontinued." The fact that six of the men who were attacked had been employed in making hempen string, suggested to the Sanitary Commissioner the probability of the virus being imported in the hemp, but "there was no clear evidence to show that the hemp came from infected persons." It is stated generally that the villages in the neighbourhood of Umritsur seemed to be liable to attack in the ratio of their proximity to, and facilities to communication with, the city. At Lahore "the first case occurred at the Railway Station in a traveller just arrived from Umritsur, and the disease was for some time confined to the Sultan Serai or rest-house—a place where travellers from all parts put up, and in the Changer Mohulla." In none of the other Districts regarding which any particulars are given, Goordaspore, Jullundur, Goorgaon, Hissar, Sirsa, Rawul Pindee, and Peshawur, all of which suffered more or less from cholera, is there the smallest evidence to show that the disease had been imported, nor are even such general statements made as those above-quoted which would lead to the suspicion that such had been the case. As regards Peshawur, it is certainly noted that there had been a brisk grain trade, and that, therefore, more than the usual intercourse with Umritsur had taken place, but such vague evidence is of little value.

His opinion that cholera was imported into the different Districts of the Punjab is supported by few facts.

34. Dr. Ince, who, under Dr. DeRenzy's direction, made special enquiry into the circumstances connected with the spread of the disease throughout the Peshawur Valley, states that, "in 17 towns and villages ont of the 329 which he inspected, the first cholera case was said to have been imported from a previously infected locality." "There is strong reason to conclude," he states, "that, like the subtle poisons of small-pox and scarlet fever, cholera may be conveyed from place to place in the clothes or in the bodies of those who have been exposed to it;" but the general conclusions which he formed as the result of his enquiry do not seem to point to the belief that such human agency is the ordinary medium by which it is disseminated; for, immediately preceding the passage which I have just quoted, he writes—

Dr. Ince, who made a special enquiry into the epidemic in the Peshawur Valley, does not conclude that cholera was chiefly spread by human agency.

"As to the cause of cholera it is probably a specific poison allied in its nature and origin to that of malarious fever. It is not known how it is generated, but the influence of heat and light and moisture, the presence of organic matter in process of decacy, and specially the existence of some peculiar condition of the air, chemical, electrical or otherwise, are probably more or less essential to its production, and the nature of the soil, the proximity of sub-soil water, and the presence or absence of trees, may also have some influence on the process. When developed, it seems to pervade the air as an unseen smoke or vapour; but the usual results of moving troops and prisoners from their barracks would appear to indicate that its diffusion is limited, and it is also probable that it gravitates being most abundant in the lower strata of the atmosphere, or those nearest the surface of the ground. It also seems that it may be absorbed by water which, as is probably the case with marsh maism, may thus become the medium of its propagation."

And immediately afterwards he adds—

"Some believe that the poison has the power of multiplying itself in the human body like the other recognized zymotic poisons as those of measles and small-pox, and, therefore, that the disease may be communicated to others either by touching the patient, or by inhaling or imbibing the exhalations or excretions of his body. This opinion, however, is rendered doubtful by the rareness with which those attending cholera patients are affected; even in cases where they are attacked, it is equally probable that both patient and attendant were infected from a common source either by breathing the same vitiated air, or drinking the same contaminated water. * * * During the epidemic at Peshawur there was a more or less universal feeling of *malaise* amongst the residents. Although not exactly ill, most people felt that there was something wrong; this was probably due to the intensity of the cholera poison which was then pervading the air."

35. I have quoted these passages at length because the epidemic was very severe in the Peshawur Valley, and this was the only portion of the Punjab in which, so far as I am aware, any special investigation was instituted into the history of the disease. The facts which Dr. Ince has recorded, and the conclusions which he has drawn from them, do not favor the opinion that the cholera was spread by human agency. The first

The evidence throughout the Punjab generally does not favor the opinion that the disease was so spread.

statement appended to his special report shows that, out of 185 villages attacked, the date on which the first case appeared was in 126 of them between the 9th and 27th of September, the very time when the epidemic was most severe in the city and cantonment. The facts which have been recorded regarding the spread of cholera in the Punjab during 1869, certainly do not favor the idea that it was diffused by persons coming from infected localities. The disease was widely diffused throughout the Province, in all 9,258 deaths were registered as having been due to it. If 50 per cent. of recoveries be accepted as the ordinary result, it follows that nearly 20,000 persons must have been attacked. Many hundreds of villages must have suffered, and yet the evidence of importation may be said to be almost *nil*. The difficulties of obtaining accurate data regarding Native communities are doubtless very great, and, as Dr. DeRenzy remarks, "failure to establish an affirmative does not prove a negative." But any opinion which does not rest on a solid basis of well ascertained facts is no better than a theory, and it cannot certainly be affirmed with reference to the recorded histery of cholera throughout the Punjab in 1869, that human agency was indispensable for its diffusion.

36. I will not, I trust, be imagined that, in making these remarks, I am arguing against the views of those who believe that human agency is the only or the chief means of spreading cholera. My object, as I have already stated, is merely to sift the evidence, and see how far it bears out the opinions which have been advanced. I am quite prepared to accept any conclusions which may hereafter be satisfactorily proved, but this is one of those important questions which requires very careful investigation before any answer can yet be given to it. Is human agency the great medium by which cholera is diffused over India? This is the point which has to be determined, and it is to be settled not by any mere theoretical considerations or foregone conclusions, but by a patient and painstaking investigation into the facts of every epidemic as it comes under observation.

The influence of human intercourse in spreading cholera requires much further investigation.

37. The water theory, as originally propounded by Dr. Snow, has attracted much attention and found many supporters in England. In Dr. DeRenzy's opinion it explains all the phenomena of the epidemic of 1869 in the Punjab, and it is, therefore, of great importance to test how far this opinion is really borne out by the evidence. The only places in the Province which suffered with any great violence were, as has been already shown, Umritsur, Peshawur, and Kohat. Is there good reason to suppose that this violence was due to the fact that the water had been tainted with cholera discharges? The water at Umritsur is very impure, but there are no data regarding the great epidemic in that city which substantiate the opinion that impure water was *the* one of the many insanitary conditions under which the people live which governed the violence of the disease. We have the two facts,—an impure water-supply and a high death-rate from cholera; but there is no reason to suppose that the one was the only, or even the chief, cause of the other. There is no reason to believe that the water of Umritsur is more impure than that of Native cities generally. The wells at Lahore, for example, are by no means pure; on the contrary, the Sanitary Commissioner states that "they are, as a rule, much exposed to pollution," and yet in Lahore, although the disease appeared, the mortality which it is occasioned equalled only 2·48 per 1,000, whereas at Umritsur it was 22·71, or nearly ten times as great. If the inhabitants of one particular quarter of the town of Umritsur or those using any particular water-supply—and it is worthy of notice that there are no less than 1,025 wells within the city—had suffered first or most severely, there would be some ground for believing that the impurity of the one caused the epidemic violence of the other. But this is the very reverse of what occurred. The first authentic case was observed on the 27th May. "After the 27th May," writes the Sanitary Commissioner, "cases were of almost daily occurrence at Umritsur, but they were not numerous in any one place. * * *

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The disease was confined to no particular quarter, but isolated cases occurred in all directions. * * From the 1st August the disease was universally diffused." But even if it be admitted that the violence of the outbreak at Umritsur was due to the impurity of the wells, it by no means follows that the result was caused by the presence in this water of any special virus derived from cholera evacuations.

There is no evidence to show that the violence of the epidemic at Umritsur was due to the use of water tainted with cholera discharges.

38. Before consideging the water theory in its application to Peshawur, some notice may be taken out of the outbreak in the Lunatic Asylum at Lahore. Dr. DeRenzy explains it occurrence on the supposition that the sand which had been used for filtering the water drunk by the lunatics had been taken from a hole a few hundred yards from the Asylum in which he found human and other excrement. "According to the standing rules of the Asylum," he says, "the filtering sand is changed every Saturday. According to rule the sand would have been changed on Saturday, the 4th September. There is a strong probability that the sand taken from the hole already mentioned was that used on this occasion. The epidemic exploded next day at 4 P. M."

The accuracy of the facts connected with the outbreak of cholera among the lunatics in the Lahore Asylum, as recorded by the Sanitary Commissioner, has been called in question.

Now, even if this statement be admitted as absolutely correct, it still falls very far short of proving that the outbreak was due to the use of water containing cholera discharges; but as a matter of fact the whole circumstances were carefully investigated by the Civil Surgeon and the visitors of the institution, and the conclusion at which they arrived was to the effect that the sand used for filtering on the day in question had not been taken from this hole, that, on the contrary, it was part of the very same supply which had been used for some time previous without any ill effects and which continued to be used after the outbreak ceased. In their opinion there was no reason to suspect that the locality from which this sand had been taken had been defiled, nor was there any ground for concluding that the use of this sand has been in the smallest degree connected with the severe outbreak of cholera among the lunatics. I have no intention of judging which is the correct version of the story, but the objections which were made both by the Civil Surgeon and the visitors to Dr. DeRenzy's statement of the facts of the case ought to have been mentioned. It is of the utmost importance that every assertion on a matter of fact should be thoroughly tested before it is accepted as correct, and that any doubts which have been expressed, especially when they come from such competent authority as they did in this instance, should be recorded.

The facts of the Peshawur epidemic do not countenance the water theory.

30. The circumstances connected with the outbreak at Peshawur have been already fully discussed in my Annual Report for 1869, and no few facts have been recorded by Dr. DeRenzy which induced me in any degree to alter the opinions which are there expressed. The main water-supply of the city and cantonment, flowing as it does in an open channel, is peculiarly liable to pollution. Here, again, as in the case of Umritsur, we have an impure water associated with a severe outburst of cholera; but there is no evidence to shew that they stood in the relation of cause and effect. Indeed, there are certain facts which favor the opposite conclusion. The main water-supply, as I have just stated, is the small stream which runs through the cantonment, and which is very liable to defilement, but the water from Mackeson's well is of good quality, and from this was obtained what was required both for the Royal Artillery and the 104th Regiment. The 36th Regiment drank of the stream water, and yet they did not suffer more than the wing of the 104th which remained in the cantonment, after the other wing left, and drank of the well water. Dr. DeRenzy attempts to meet this difficulty by saying that the troops who were supposed to be supplied from the well may really have obtained their water from the stream, for the water-carriers must naturally prefer to fill their *mussucks* in the easiest manner possible. When at Peshawur I made special enquiries on this point, and was assured on the best authority that the supply both for the artillery and the 104th was very carefully taken from Mackeson's well. The water theory altogether fails to account for the facts—the escape of the left wing of the 104th Regiment which marched from the cantonment soon after the disease commenced, the continued suffering of the 36th Regiment long after it had ceased to draw its water from the cantonment, cutting the extreme violence of the disease among the different bodies of troops whether in the cantonment or in camps, among the Native population of the cantonment and the city, and also I believe throughout the Peshawur Valley generally on one and the same day—the 19th September. The immunity of the small garrison of the fort, Dr. DeRenzy attributes to the better quality of the water of the well from which their supply was drawn, and yet the water of this well is certainly no purer and no better defended than the water of the wells at many stations of which the troops drank, and yet suffered severely.

Nor do those at Kohat, but the details are imperfect.

40. The facts regarding the epidemic at Kohat are very much of the same character. Here the water-supply runs in an open stream, and is very liable to pollution, and here also the people, both of the city and cantonment, suffered much. The record of the outbreak is imperfect. In discussing the circumstances connected with it in my annual report, I was obliged to content myself with a short general statement which was supplied to me by Dr. Kelly, the Medical Officer of the 1st Cavalry. Without a full account of the several movements of the troops, and of the water-supply with which they were provided at their different encampments, it would be impossible to discuss the facts of this outbreak which bear on the water theory with any degree of satisfaction. But here, again, even if it be admitted that the use of impure water was the main agent in spreading the disease, it still remains to be proved that this water acted in virtue of any cholera discharges which it contained.

At Peshawur different communities drawing their water from different sources all suffered severely.

41. The experience of London in the matter of cholera epidemics which Dr. DeRenzy quotes as demonstrating the truth of the water theory is chiefly valuable, because it showed that, in certain communities living with one exception under the same conditions, the violence of the disease appeared to be regulated by the quality of the water-supply—the one condition which they differed. But no evidence of this nature has been adduced in India. There are innumerable instances of towns and cantonments suffering severely from cholera, of particular bodies of troops being attacked while all the others escaped, but no evidence has ever been adduced to connect the attack or the escape with the use of any particular water. Those who suffered, and those who escaped frequently drew their supply from one and the same source. And the facts at Peshawur do not tally with the experience of London. The London experiment has, indeed, been repeated at Peshawur with a very different result. Here, also, we have different sections of the community living under similar conditions in every respect, except the source from which they drew their water-supply, but there has been little difference in the extent to which they have suffered from cholera. It may be urged that, although the sources may have varied, they all agreed in being more or less impure; but even if this be admitted, it can hardly be conceived as possible that all of them should have been contaminated with cholera discharges, and that in such a way as to cause the greatest number of attacks in each of the communities who used them on or about one and the same day.

The geographical distribution of cholera cannot be explained on the water theory.

42. Nor can the geographical distribution of cholera in India be explained on the water theory. The water-supply of the people throughout the Punjab and the greater part of the North-Western Provinces is very much of the same character: it is drawn from wells which are all liable to pollution in very much the same way and to the same extent; and yet between Umritsur and Peshawur, a distance of several hundred miles, although cases were recorded from many of the Districts between the month of May, when the first case appeared in Umritsur, and the month of September, when the outbreak commenced at Peshawur, with the exception of the case of the Lunatic Asylum at Lahore, we have no history of any special violence in any particular locality. In the North-Western Provinces, on the other hand, we have large tracts of country where the people suffered most severely. Is it conceivable that in the one case it so happened that all the wells over a large area escaped the cholera pollution, while those in the other area were generally so contaminated? Again, is it reasonable to imagine that in one year the water over one area is polluted with cholera discharges, while in another year the pollution falls on a different portion of the country?

The general facts of the epidemic in the Punjab do not support the water theory.

43. On a careful examination of all the facts, I cannot, therefore, admit that there is any evidence to prove that cholera-tainted water was the most influential of all the conditions which favored the propagation of cholera in the Punjab in 1869. Much more precise and positive proof must be adduced before the doctrine can be accepted as a truth. That good, pure water is one of the next important requisites for health I fully admit, and, as I have frequently urged, there is no more pressing reform required in cantonments, cities and villages than the provision of a really good water in ample quantity of the best quality and defended in every way from impurities, but the value of this reform can be insisted on just as forcibly and, indeed, with even greater justice, without attaching to it a theory which, so far as the facts regarding cholera in India are concerned, as yet rests on no basis whatever. Facts may hereafter be adduced to show that this water theory is more or less true, but, until such evidence is produced, the assertion that cholera is propagated mainly by cholera-tainted water remains unproved. This is one of the great questions to be investigated by the Sanitary Commissioners with the utmost care and attention, but such an investigation can never be conducted with the hope of any satisfactory results, if it be assumed at the outset that certain theories regarding the disease have already been established as facts, that cholera cannot be diffused except by human agency; that cholera evacuations contain the special virus by which disease is spread, and that this virus acts on any community by gaining access to the water-supply. If the truth of these statements is believed by the enquirer to have been already demonstrated, very little remains for him to learn. But if, on the other hand, he enters on the study of an epidemic with his mind altogether unbiased, he will find, difficulties and anomalies innumerable, which require the most patient and painstaking investigation.

The reasons which Dr. DeRenzy assigns for devoting a large part of the cholera section of his report to reviewing Dr. Bryden's work are based on a misapprehension.

44. Before leaving this section of Dr. DeRenzy's report, I must shortly advert to that large portion of it which is devoted to a review of Dr. Bryden's work on cholera. I have no intention of entering into this discussion, but the reasons which Dr. DeRenzy assigns as rendering it necessary for him to examine Dr. Bryden's views are founded entirely on a misapprehension, and, therefore, require some notice. "It is necessary for me," he writes, "to examine the propositions which express Dr. Bryden's theory in some detail, because (1) this officer's forecasts of the probable distribution of cholera and his views of its mode of dissemination have become the recognized basis of the action of the Government of India against cholera; (2) because the principles he maintains are diametrically opposed to those on which in my report for 1868 I urged the Punjab Government to proceed; and (3) because I consider his theory erroneous and seriously calculated to retard sanitary progress." The first of these three statements is altogether incorrect and without the smallest foundation of fact. The action of the Government of India in regard to cholera has never, in the slightest degree, been influenced by any theoretical considerations whatever. In June 1869, the special occasion to which I presume Dr. DeRenzy refers when cholera threathened to be general over Upper India, I recommended that, if the

disease should appear at certain stations which had suffered severely in former years, the troops should be at once removed to places which had hitherto enjoyed a remarkable immunity from cholera, and arrangements were made to carry this suggestion into effect. Happily it was not required in the case of the stations selected, but the recommendation rested on no theory but simply on the experience of a series of years. The rules to be observed on the appearance of cholera among European troops have been framed so that no precaution may be omitted which there is the smallest reason to believe may be adopted with advantage. They enunciate no theories, and yet the procedure they prescribe might have been recommended by the most enthusiastic believer in human intercourse and the water theory.

So is his statement that Dr. Bryden's views are calculated to retard sanitary progress.

45. With Dr. DeRenzy's second reason I have no concern, nor with the first portion of his third reason; but when he states that Dr. Bryden's theory is "calculated seriously to retard sanitary progress," he falls into a grave error. The progress of cholera over a given area, according to Dr. Bryden, is to a certain extent inevitable; but the degree in which the inhabitants of that area are likely to escape will depend greatly in their sanitary condition, on the purity of the water-supply, the excellence of the drainage, and the completeness of all other such arrangements. Dr. Bryden's object was not to write a work on sanitation, but to explain what he believes to be the laws which govern the spread of epidemic cholera over the country. The benefits of sanitary improvements were not insisted on, simply because this was not the point under discussion. But if Dr. Bryden's views should be substantiated, they will enforce the necessity of great sanitary improvements as the main means of escape, perhaps more strongly than any others which could be advocated; and such reforms would embrace not only the one item of a good water-supply, but every other requisite for health.

Such criticisms are calculated to do much harm by converting the Sanitary Commissioners into partisans of some particular theory in place of being, as they should be, earnest and unbiased observers of facts.

46. Dr. DeRenzy does but scant justice to Dr. Bryden's remarkable work, and it appears to me that, if such a proceeding as he has adopted is to be generally followed, it will lead to very inconvenient results. In any department it would be highly undesirable that one officer should dilate on and endeavour to expose what in his opinion are the fallacious doctrines of another, but in the investigation of such a difficult question as the causation of disease, and especially the causation of cholera, where our knowledge is as yet so far from exact, this course is especially to be deprecated. If the Sanitary Commissioners are to be engaged in reviewing each others reports, much of the benefit expected from their appointment will certainly be lost, and there is every reason to fear that what ought to be an altogether impartial investigation into facts will rapidly degenerate into controversy. In order that a Sanitary Commissioner may properly discharge the important duties assigned to him, it is of the first importance that he should keep his mind perfectly unbiased by all theories. His great aim should be to collect facts, and *from these facts*, by a process of strictly logical induction, to draw what conclusions may be warranted by them, his judgment being altogether unfettered by the opinions which have been expressed even by the highest authorities. India presents a field for the study of cholera and other diseases such as can be found nowhere else, and the evidence which is year by year available in each Province, if carefully collected, affords ample field for study. If a Sanitary Commissioner is to become the advocate of any particular theories, and the opponent of every other Sanitary Commissioner who differs from him, it is quite impossible that he can preserve that thoroughly unbiased and unprejudiced frame of mind which is so essential for the successful discharge of his duties; he will see only the facts which suit his own peculiar views, and insensibly shut his eyes to those which tell against them. Full and free discussion on sanitary matters is of great value, but this can be perfectly secured without introducing any element of controversy; and I would, therefore, strongly recommend that the Sanitary Commissioners should refrain from criticising the views which may be held by other officers in the same department.

The conclusions of the Sanitary Commissioner of Oudh are chiefly negative.

47. The Sanitary Commissioner of Oudh is of opinion that the history of the epidemic in that Province has shed no light either on the nature, the origin, or the mode of the propagation of cholera. He is still inclined to the opinion that "there are two entirely distinct diseases known under the same name one of which is of a spreading nature, and the other is not," but this is one of those general statements which, in the absence of all proof, is of very little value. Dr. Sutherland states that "there has been no evidence of contaminated water being the means of conveyance of the disease, or of its germinating in the soil."

In the Central Provinces Dr. Townsend believes that cholera was spread solely by human agency.

48. The most important conclusions at which Dr. Townsend has arrived regarding the epidemic in the Central Provinces may be learned from the following passages of his report: "It is scarcely too much to say that the cholera which spread over the whole of the Central Provinces and the Bombay Presidency, and reached southward as far as Hyderabad in 1868-69, is traceable primarily to the cities of Mirzapore and Benares on the Ganges, and secondarily to the gangs of coolies on the road between Jubbulpore and Nagpore, and that human intercourse was the sole agent by which the spread of the disease was effected. The current in the main artery of communication between Eastern and Western India became polluted, and every region supplied by its ramifications became affected more or less according to its susceptibility. * * * * * * *
Every District in which enquiries were instituted furnishes evidence of importation by means of human intercourse, and in this as in my last report instances are everywhere given of the effect of fairs and other gatherings of people, and of the communication of the disease from village to village and from person to person." * * *
"Taking the facts that I have collected in this report and that of last year, I think it must be conceded that cholera spreads by the agency of human intercourse, and that it requires no other medium for its diffusion; that in other words it may fitly be placed in the category of contagious epidemic disease."

* * * * *

"In this report and in that for 1868 frequent instances have been given in which cholera was conveyed from one locality to another by persons not suffering from the disease, and there can be little doubt that during an epidemic this constantly happens."

Many instances have been given by him which appear to favor this view, but it is not supported by the general history of the epidemic.

49. These extracts show that Dr. Townsend is a firm believer in human agency as the great if not the only means concerned in the diffusion of cholera; and it must be admitted that, in his very careful enquiry, a very large number of instances are adduced in which the disease appears to have been communicated by persons eitheir suffering themselves or coming from an infected locality. The general history of the epidemic, as described by Dr. Townsend in the following passage, does not, however, favor the idea that human intercourse was even the main medium by which the disease was spread. "It may be said generally," he writes, "that the epidemic of 1869 had become diffused over the Province by the end of March and beginning of April; that its prevalence increased rapidly in May and reached its maximum early in June before the rains set in and then declined; from the beginning of July the decline was rapid, and continued with a slight interruption in the first part of August till October, when the epidemic finanally died out. This description of the rise and decline of the epidemic over the whole Province applies to the greater number of the different Districts. These were, however, exceptions." That there was some general influence at work which produced these results, and which governed the rise and fall of the epidemic over a large area, cannot be doubted; but whether it was a miasm in the air or some other cause, regarding the nature of which we are as yet profoundly ignorant, has still to be determined.

Dr. Townsend believes that the one general influence which governed this history was the condition of the water-supply.

50. Dr. Townsend is of opinion that this one general influence is the condition of the water-supply, not the water theory in the same sense in which it was advanced by Dr. Snow and advocated by Dr. DeRensy, but simply that the rise and fall of the disease are intimately associated with the impurity or purity of the water drank by the inhabitants. His remarks on this point are very interesting and well worthy of attention:

"671. In the report on cholera that I submitted last year I adduced a number of facts showing the intimate connection between impure water and the prevalence of cholera among the Native population, and the evidence of this report of which the above diagram may be considered an epitome, particularly if read in connection with Table 14, showing the rise and fall of the water in the wells in different parts of the Province, abundantly confirms the conclusion there drawn that drinking water fouled with organic impurities is the chief, if not the sole, condition under which cholera becomes epidemic in these Provinces.

"672. The descriptions that have been given in the foregoing pages of the water-supply of the different Districts confirmed as they are by the drainage statistics given in Tables 13* and 14† show that from the time that the rains cease in September till the rains of the next season commence, the water-supply of the country is continually diminishing and deteriorating; as the hot weather approaches, the current in the larger rivers slackens, and in the smaller streams ceases altogether, tanks more or less dry up, the water in the wells runs low in the second or third week of April, the hot and dry North-Westerly winds set in, evaporation becomes exceedingly rapid, the diminution of the water-supply is greatly accelerated, and the insects and animalculæ that swarm in all sources of water-supply die and putrify. The extent to which this death of animal life in water takes place will, of course, depend on the volume of water and the conditions of stagnation and exposure to the action of sun and evaporation; but I believe it may safely be said that annually, in the hot weather between March and

* Flow of water in Kanhan.

† Rise and fall of water in wells.

June, a very large proportion of the drinking water of the people of this Province passes through a state of putrefaction. It is at this time that cholera is most rife, and it creates the greatest havoc in those Districts in which water is most scanty and most exposed to the action of the sun and of evaporation, in Chattisgarh and Mundla, where the water-supply is derived from tanks or from stagnant nálás.

"673. Towards the end of May, the South-Westerly winds and gathering clouds, which indicate the approach of the monsoon season, check the deterioration of the water-supply; cholera begins to decline, and, with the first showers of the rainy season, there is a considerable fall in its provalence; but with the heavier rains, another cause, by which the water-supply is rendered impure with animal matter, comes into play, and the tanks and wells become fouled by surface drainage. The operation of this cause is first evident in the District of Biláspúr, where, as I have shown, the tanks are most liable to pollution by surface drainage from the villages; a little later, when the rains have continued for some weeks, the surface water reaches the wells, and we find the prevalence of cholera increasing in the Districts of Nágpúr plain, where the water-supply is largely derived from wells sunk in porous strata, and in which the rise of the water is most rapid; but even here the operation of this cause is most marked in the towns wihch have a wide area of polluted soil, and few villages are affected by it. The general decline of cholera throughout the country, though impeded by this cause, still continues, and eventually, when the sources of water-supply have been everywhere replenished and the rains cease, cholera dies out. * * *

"680. All these facts tend to show an intimate connection between cholera and water contaminated with animal organic matter. They do not, however, support the view that the water, under the use of which cholera is produced, is contaminated with the excreta of persons suffering from the disease; that it is simply the medium by which a specific poison contained in choleraic excreta is conveyed into the system. That choleraic dejections may contain specific poison, is quite possible; but that the diffusion of the disease over a wide area depends upon this poison being communicated through the medium of the drinking water, is most improbable. The evidence of the epidemic of 1869 in these Provinces is totally opposed to this view; for the diffusion of cholera by this means sufficient rain-fall to wash surface impurities into the water is presupposed; but in these Provinces, a full of rain in the hot weather that yields any surface drainage is a comparatively rare occurrence; and a reference to Table 12, which gives the rain-fall of the Province in 1869, will show that during April and May, when the epidemic spread with the greatest violence, the mean rain-fall over the whole Province did not exceed half an inch; and it is rather remarkable, too, that in the Districts of Nimar, Chindwará, Chándá, and Sironchá, where the rain-fall in May was rather above the average, cholera was least prevalent.

"681. While, therefore, I by no means deny the probability that the dejections of cholera patients contain the specific virus of cholera, I believe the instances in which the disease is communicated by water contaminated with this form of pollution to be comparatively rare. The connection between cholera and impure water is most commonly that of a predisposing cause, and there is reason to believe that any form of decomposing animal matter will create this predisposition; that water polluted by dead bodies thrown into it or buried near it, by the death of the animalculæ, or fish that swarm in nearly all sources of supply, or by the excrement of men or cattle conveyed into it by surface drainage, or percolation through a porous soil, will act as a virulent and fatal poison when the infection of cholera is present.

"682. I have given evidence, both in my last report and in this, that the inhabitants of a town or village may use water impregnated in an excessive degree with animal organic matter with apparent impunity as long as they are not exposed to the infection of cholera; but when this happens, when an infected individual arrives among them, the disease is manifested with violence in proportion to the degree of pollution of the water-supply."

51. Much, no doubt, depends on the water-supply; but if the circumstances described by Dr. Townsend are those which govern the rise and fall of cholera, or, if, to use his own words, "drinking water, fouled with organic impurities, is the chief, if not the sole, condition under which cholera becomes epidemic in these Provinces," it is difficult to understand why it is not epidemic in every year.

If this view be correct, then cholera should be epidemic every year.

52. In a succeeding paragraph Dr. Townsend, as if anticipating such an objection, propounds the theory that "the disappearance of cholera is due primarily not to the dying out of the choleraic influence or contagion, but to the absence of individuals susceptible to its effects," and that "a tract of country over which cholera has spread is for a time protected from a recurrence of the disease." But how is such a theory to be reconciled with the persistence of cholera within its endemic area, or how are the oftrecurring epidemics, which break out in Districts bordering on this endemic area, to be explained? The question, although of theoretical interest, is of no practical importance, except in so far as it is connected with Dr. Townsend's opinions in relation to the impurity of the water being "the

Dr. Townsend believes that this is prevented by all those who are susceptible having been already carried off.

chief, if not the sole, condition under which cholera becomes epidemic." Without much further evidence, the theory could not be accepted. It is difficult to believe that when more than 100,000 persons, double the number who died of cholera in the Central Provinces in 1869, were found susceptible to the disease, in one year, only 240, double the number who died in 1870, should be found susceptible in the year following, out of a population of over 6,000,000. Moreover, there is certainly no evidence to show that one attack of cholera confers any immunity from subsequent attacks; on the contrary, there is some reason to believe that those who once suffer are rather more liable to the disease than they were previously. But without insisting on this latter point, there remained 50,000 persons in the Central Provinces in 1870 who had recovered in 1869; there is no reason to doubt that they were susceptible to the disease, and yet in the whole Province only 120 persons died of cholera in 1870.

53. Dr. Townsend also has criticized Dr. Bryden's views in relation to the facts of the epidemic as it affected the Central Provinces. I have no intention of attempting to defend these views. At another time, with further experience, Dr. Bryden will, no doubt, be able to explain them still more fully, and to adduce fresh illustrations of the general truths which they contain; but I would observe that there are some points in Dr. Townsend's remarks which deserve notice. In the first place, it is to be noted that, according to Dr. Bryden, the cholera of the Central Provinces in 1869 was not a new invasion, but a reproduction of the cholera of the previous year, and that, therefore, the meteorology, so far as regards the prevailing winds, does not affect the question. If the meteorology of 1868, the year in which the invasion took place, be considered, it may be argued that here also the prevailing winds did not favor the entrance of any miasm from the endemic Province of the disease, but too much stress appears to have been laid on the question of the comparative prevalence of different winds. If cholera is an air-borne miasm, which is sown broadcast over a large area by means of wind, it is quite conceivable that it should be so sown with great rapidity.

In the history of the epidemic in the Central Provinces, there are several striking facts which support Dr. Bryden's views.

It is to be remarked, moreover, that the wind which Dr. Bryden believes to have been the vehicle by means of which the Central Provinces were invaded by cholera in the spring of 1868 was a North-East wind—a wind, in fact, which would follow very much the same track as the highway from Mirzapore and Benares, along which, according to Dr. Townsend's belief, the disease was imported by human beings. A reference to page 154 of Dr. Bryden's general report, and especially to the foot note on that page, shows that such North-Easterly influences prevailed to an unusual degree at the time in question, and this phenomenon is easily accounted for by the signal failure of the South-West monsoon which characterized the year. I am not arguing in favor of the air-borne theory, but it is certainly not disproved by the fact that the winds in 1869 were not *generally* such as would bear up a misam from the delta of the Ganges. Dr. Townsend's remarks on the extreme dryness of the atmosphere, which characterized the season when cholera prevailed in the Central Provinces, is a much more important point; but I must leave Dr. Bryden to consider the facts adduced by Dr. Townsend in connection with the views which he has advanced on the condition of the atmosphere most favorable to the spread of cholera. I would observe, however, that in Dr. Bryden's report on the cholera of 1869, he shows that the meteorology of the Central Provinces between the 9th and 15th May—the week in which the disease appears to have extended to the Districts which had escaped in 1868—was characterized by the general diffusion of moisture as indicated either by actual rain or the presence of clouds.

It is also very remarkable that, during the severe epidemic at Raipore—the only place in regard to which the daily register of the weather is given in full—clouds were frequent, and there were also occasional showers. In commenting on the Table which shows the "meteorological conditions at Raipore during the epidemic," Dr. Townsend remarks (paragraph 513)—"It will be observed that the period of the epidemic was characterized by great heat and dryness of atmosphere; that during the week in which it reached its maximum, storms of wind from the South with electric disturbances and a few drops of rain were frequent. With the exception of the slight shower registered on the 21st May, and the few drops of rain that accompanied the electric disturbances in the following week, there had been no fall of rain since the middle of March, and none occurred till the 22nd of June. By that time the epidemic had ceased in the town, and was on the decline in the District." I observe, however, that, from the 10th of May, the date on which the register commences, up to the end of the month, although the mean humidity denotes great dryness of atmosphere, clouds were very frequent. In 18 out of these 22 days their presence is noted in a greater or lesser degree, and the same remark applies to 14 out of the first 21 days of June.

54. The sanitary report of the Central Provinces for 1869 is of much value, and opens up an almost endless field for discussion and attentive consideration in regard to cholera. The great questions connected with the disease still remain to be solved, but no better means could be adopted for accomplishing this important end than the special personal

The mode of enquiry adopted by Dr. Townsend is the best adapted for the purpose.

enquiry which Dr. Townsend instituted, and the record of which is contained in his report. He has also suggested that a still more searching investigation should be undertaken in certain selected portions of the Central Provinces, where, with the aid of a medical officer and of Native Doctors, the whole facts within a limited area may be examined and accurately recorded. This investigation has been proposed as a contribution towards the special enquiry recommended by the Army Sanitary Commissioner in the 5th section of their instructions for conducting a cholera enquiry in India, and it will, I trust, soon be in operation.

The epidemic in Berar was supposed to be due to the use of pit-stored grain.

55. The epidemic of cholera in Berar is chiefly interesting from the fact that its violence was attributed to the use of old grain which, having been stored in pits for many years, was required under the pressure induced by the scanty crops of 1869. But a more careful investigation showed that this theory, which had been advanced by the Superintendent of the Revenue Survey, was incorrect. Although the pits in use in certain parts of the Province had been drawn on to a large extent, the grain was not required for local consumption, and had been exported to other Provinces where the demand was great. It moreover appeared that in those parts of Berar where such pits exist, cholera had not been so prevalent as in others where they are not used, and, as a matter of fact, the particular part of the country regarding which the theory had been advanced suffered less than any other portion of the Province. The pit-grain certainly could not be regarded as wholesome food, and was apparently well calculated to favor disease, especially of the digestive organs; but Dr. Lewis, to whom specimens were forwarded for examination, reported that, beyond having lost great part of its nutritive value, it did not present any peculiar features, nor did it develop any special organisms such as might be associated with the occurrence of an epidemic.

Notwithstanding different theories, there is a general consent as to the value of sanitary improvements as the best preservative against cholera.

56. The discussion of the cholera of 1869, and of the various opinions which have been advanced by the several Sanitary Commissioners with regard to it, has occupied much space; but the epidemic was a most important feature in the sanitary history of a very unhealthy year, and it is of the greatest importance that all the facts connected with it should be carefully examined. It will be observed that I do not consider any of the opinions adopted by the Sanitary Commissioners as proved; some of them are purely theoretical, others require patient investigation and further proof; but it is satisfactory to know that these theoretical considerations do not materially affect the practical measures which seem best adapted to arrest the violence of any future epidemic. The strongest supporters of the doctrine that cholera is spread by human agency, or by human agency alone, such as Dr. DeRenzy and Dr. Townsend, fully admit the impossibility of adopting quarantine. All are persuaded of the value of a pure water-supply, and the argument in favor of this essential requisite of health is in no degree strengthened, indeed it is rather weakened, by the theoretical assumption that cholera will attack any community with violence only when that water contains cholera discharges. The practical lesson of the epidemic is the same as that which has been taught by all former epidemics, general sanitary improvement or, as Dr. Planck has well stated it, "the improved sanitation of the Province generally, and especially of the principal centres of population."

57. Cholera was not the only disease which was more than usually prevalent in 1869. Small-pox and fever, to all appearance the ordinary malarious fever of India, attained a very remarkable ascendancy and caused great mortality. With regard to each of these very wide-spread epidemics, I shall endeavour to summarize all the information that can be collected from the reports of the different Provinces, but must premise that the history of both diseases is much less complete than it ought to be. Of the general distribution of small-pox over the Lower Provinces nothing is known. It does not appear whether the disease was more or less prevalent than usual. At Dacca there was an outbreak which began to prevail in September 1869 and lasted, it is reported, till the month of April 1870. The case is interesting chiefly on account of the special measures which were adopted to check the disease. Extra vaccinators were employed, a special small-pox hospital was established, and every precaution taken to arrest its spread. The great extension of the disease which was to be feared in the spring did not take place.

SECTION II.

B.—*Small-pox.*

Its distribution and relative prevalence in the Lower Provinces are not recorded.

Outbreak at Dacca checked by special measures.

58. How widely small-pox was spread in the North-Western Provinces during 1869, and what a fertile source of mortality it was, may be judged of by the fact that while 69,542 deaths were registered from the great cholera epidemic of that year, the deaths attributed to small-pox numbered no less than 90,770. These figures are doubtless far from accurate. Deaths arising from measles and any other diseases associated with an eruption on the skin, are apt to be included by the people under the one general head of small-pox; but against this source of error, which is calculated to increase the

In the North-Western Provinces small-pox was more prevalent and fatal than cholera.

number, it must be remembered, on the other hand, that very many deaths as yet escape registration altogether, and the probability is that the mortality from small-pox has been rather under-stated than placed at too high a figure.

The escape of Kumaon and Gurhwal, where vaccination had been general, bears striking testimony to the protective power of vaccination.

59. The information regarding this great epidemic is unfortunately very scanty. During the first five months of the year the disease was epidemic in many of the Districts and prevalent in almost all. The fact that Kumaon and Gurhwal, with a population of nearly 650,000, escaped with only nine deaths, while in other Districts the victims were numbered by thousands, is a striking testimony to the protective power of vaccination and to the able exertions of Dr. Pearson who laboured so many years and with so much success to protect the people in these hilly tracts of country.

The monthly rise and fall of small-pox are illustrated by the statistics in a few Districts.

60. The deaths from small-pox are not shown according to months except for four Districts, but these statistics well illustrate the seasonal prevalence of the disease—the gradual rise from January to April, and then the gradual decline:

1869. Month.	Deaths from Small-pox. Allygurh.	Agra.	Cawnpore.	Banda.
January	840	1,342	331	787
February	981	1,212	471	1,265
March	1,337	1,456	1,098	2,056
April	1,285	1,834	1,615	1,798
May	1,218	1,183	1,718	827
June	478	442	723	239
July	175	132	243	57
August	59	117	83	8
September	21	52	25	5
October	18	12	18	3
November	14	12	6	...
December	23	8	6	1
Total ...	6,449	7,802	6,327	7,046

Dr. Planck's idea that the annual increase of small-pox every cold weather is due to the general practice of inoculation at that season, is not consistent with the facts.

61. This rise and fall of small-pox, which is not confined to the North-Western Provinces, to any one section of the community, or to any particular year, is one of the most remarkable and unaccountable features of the disease which is of great interest, and the cause of which requires very careful investigation. Dr. Planck's theory on the subject is altogether unsupported by facts. "I am inclined to think," he writes, "the reason why deaths from small-pox always commence and increase in the cold weather months is that inoculation is practised then, and so the contagion of the disease is spread in every centre of population to end by becoming epidemic in some years in the months." It is a known fact that wherever inoculation is practised, there is a certain amount of risk of spreading the disease; but the opinion that the increase of small-pox over a whole Province at a particular season of the year is really due to inoculation, would require some proof before it could be accepted as correct. Different Districts must be compared,—those in which inoculation is the practice and those where it is not known, and the results examined. As a matter of fact I find from a summary of very interesting information on the subject of inoculation in different parts of India, which was issued by the Medical Department in its "general report No. 2 on the Lunatic Asylums, Vaccination and Dispensaries in the Bengal Presidency for 1869, compiled by Surgeon-Major Ross, Secretary to the Inspector General of Hospitals, Indian Medical Department," in 1870, that, in the North-Western Provinces, inoculation is the exception and not the rule. It would appear to be confined to the Benares Circle and the Jounpore District. Throughout

the Provinces generally it is unknown. In the four Districts, for example, which Dr. Planck has cited in illustration of the rise and fall of the disease, no inoculation would appear to have been carried on, and, as he remarks, "a like table of all the Districts would give the same general result," those few in which inoculation is resorted to obeying the same law as those in which it is not adopted.

62. Although Section 2 of Dr. DeRenzy's report is devoted to "the history of the epidemics of the year," the only two diseases of which it treats are cholera and fever. Small-pox is not alluded to and yet 53,195 deaths from small-pox were registered, or nearly six times the mortality from cholera. The Districts in which it chiefly prevailed, and the monthly prevalence of the disease are, however, clearly shown in Returns A. and B. of the Appendix attached to the Report. In the District of Montgomery the highest death-rate from small-pox, 11·79 per 1,000, occurred. In Gurgaon it was 10·34. In six other Districts the rates were over 5 per 1,000. In the Province generally it was 3·05. The comparative prevalence in different months is shown in the annexed statement.

The details of the small-pox epidemic in the Punjab are to be gathered from the tables appended to the report.

Monthly deaths from small-pox in the Punjab in 1869.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
6,307	6,382	7,169	6,946	10,609	6,768	3,217	1,835	978	582	836	1,566	53,195

63. In Oudh 21,564 deaths were ascribed to small-pox, or very nearly as many as were attributed to cholera. The death-rate under this head varied from the 8·9 in Oonao to 0·1 in Kheree. For the Province generally it was 1·9. No details are given showing the distribution by months.

The deaths from small-pox in Oudh are not shown by months.

64. The Central Provinces also suffered severely from small-pox, and the statistics for 1869 show a very remarkable increase in the mortality from this disease. In 1867, and again 1868, the deaths registered under this head were about 3,000. In 1869 they were nearly 17,000. The mortality by months was as follows, and it will be observed that, although the decline commenced a month earlier, the disease obeyed the same general law as that which was followed in the other Provinces:

In the great epidemic of the Central Provinces the decline commenced a month earlier than in the Punjab.

Monthly Deaths from Cholera in the Central Provinces in 1869.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
644	1,073	2,601	4,648	3,849	1,991	932	461	239	141	114	156	16,849

These statistics are valuable so far as they go, but, as Dr. Townsend remarks, the amount of mortality from small-pox does not afford a very accurate test of the relative prevalence of the disease in different Districts, for the fatality varies greatly. From certain selected returns it appears that the proportion of deaths to cases varied in five Districts from 4·8 to 20·8 per cent. Dr. Townsend is inclined to believe that, in the Central Provinces, the course of an epidemic of small-pox is, to a great extent, parallel with that of an epidemic of cholera, and that a water-supply impregnated with animal matter which, in his opinion, regulates the violence of cholera, aggravates the effects of the contagion of small-pox, and renders it more deadly in its operation. That the diseases may rage together I have no doubt, but the mere fact cannot be taken as proof that the cause of cholera is a specific poison which passes from man to man.

65. Berar also suffered much from small-pox: 6,365 deaths from it were registered, or 3·0 per 1,000 of the population. The number in each month is shown in the annexed statement.

The epidemic was also severe in Berar.

Statement showing the Monthly Deaths from Small-pox in Berar in 1869.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
2,769			1,434	1,012	497	269	195	69	28	37	55	6,365

66. In the Madras Presidency small-pox caused a heavy mortality, but the deaths, nearly 18,000, were not so numerous as in 1868, when they numbered 34,330. The monthly mortality from the disease is shown in the annexed statement.

In the Madras Presidency small-pox was not so fatal as in either of the previous years.

Statement shewing the Monthly Deaths from Small-pox in the Madras Presidency during 1869.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1,956	1,661	2,123	1,943	1,894	1,609	1,565	1,358	1,009	896	760	977	17,751

67. The deaths registered as having been due to small-pox in the Bombay Presidency during 1869 were 12,673. The details are not given by months, but it is noted that by far the greater number occurred during the first-half of the year, the proportion during the first six months having been nearly as 5 to 1 compared with those in the other six. The greatest number (2,239) were reported in April, but in March they fell only 200 short of this figure.

The deaths from small-pox in the Bombay Presidency are not detailed by months.

68. Fever is the only other disease of which special mention need be made in reviewing the vital statistics of the year, and, great as was the mortality from cholera and small-pox, the mortality from this cause was much greater still. The deaths recorded under this head are less accurate even than those under the other heads; for the uneducated are quite unable to distinguish with any accuracy the cases which should be recorded under it, but there can be no doubt that the year 1869 was characterized by one of the most wide-spread and fatal outbreaks of fever which can be remembered. The history of this great epidemic is unfortunately very incomplete, but some interesting details can be gleaned from the reports of the different Sanitary Commissioners.

SECTION II.—*Fevers were more wide-spread and fatal than even cholera or small-pox.*

69. In the report for Bengal allusion is made to severe fever epidemics which occurred at Burdwan and at Serampore, but the papers to which reference is made as containing the history of these outbreaks are not printed with the report. The measures of relief which were adopted only are described.

Fever was very prevalent at Burdwan and Serampore, in the Lower Provinces, but details are wanting.

70. In the North-Western Provinces during 1869, no less than 246,838 deaths were attributed to fevers, or nearly one-half of the total mortality of the year. The ratios for each District are not given, and it is thus impossible to compare the results in different parts of the country with any accuracy, but two facts are evident, *first*, that in nearly every District there was a marked increase of deaths from this cause as compared with the statistics of the year previous; and *secondly*, that many of them suffered from a wide-spread and fatal epidemic. The chief mortality appears to have taken place in the months which immediately succeeded the heavy rain-fall of September and the first days of October—a rain-fall which covered the country and filled every hole to overflowing. Dr. Planck is of opinion that the fever was due, in some part, to this excessive moisture, and that in the case of Saharanpore and Mozuffernugger this result was in no small degree dependent on irrigation from

The Sanitary Commissioner of North-Western Provinces is of opinion that, in those Districts which suffered most, the fever was due to over-irrigation from the canals.

the canals. The condition of these Districts was made the subject of special investigation; and, as the result of this enquiry and of his visits to the affected localities, he repeats the opinion that great part of the disastrous results of the year may be attributed to over-irrigation. The practical remedies which he recommends are contained in the following paragraph:

"344. I would, therefore, very earnestly counsel the gradual but certain establishment—

"(A.) Of such measures as may conduce to a lessened amount of canal irrigation,—

"1*st* by discouraging the cultivation of rice wherever it was not cultivated before canal irrigation was introduced, and, perhaps, the best way of doing this would he to increase the land tax of such land so long as rice is cultivated on it;

"2*nd* to introduce some method of distribution which shall require an increase to the manual labor now required to place the water so that it may spread itself over the fields;

"3*rd* to encourage a return to the ancient form of irrigation from wells in all places where the water in the wells now stands at less than 10 feet from the surface at any time of the year.

"(B.)—Of such measures as may improve the town and village sites—

"1*st* by raising them to the utmost possible extent, levelling and consolidating the surface;

"2*nd* by requiring a return to irrigation from wells of the land for a certain distance around every town and village;

"3*rd* by draining permanent water-holes to the nearest *nuddee*, the earth removed from the necessary cutting being utilized for the improvement of the town or village site;

"4*th* by planting trees between any noted source of malaria and the town or village site: by removing trees where they stand too thickly and serve no good purpose."

But Districts of the Central Provinces and Punjab, where there is no canal, suffered more.

71. The question of irrigation as a cause of malarious disease is one of great importance, not only as regards those parts of the country where canals are already in operation, but also in connection with the great works of a similar nature which have lately been projected, and some of which have been already commenced. I do not mean to throw any doubt whatever on Dr. Planck's statement that over-irrigation will make tracts of country previously healthy more subject to fever than they used to be; but such questions cannot be regarded from a merely local point of view. The prevalence of fever in 1869 was not confined to the North-Western Provinces. The Central Provinces and the Punjab, as we shall presently see, had a very heavy mortality from the same cause, and not a few of their districts where no canal runs, and which are in ordinary years remarkable for the health of the inhabitants, suffered as much as either Mozuffernugger or Saharanpore. This will appear more clear from the following comparison: The District of Goordaspore, in the Punjab, it is to be noted, has a canal running through, and it has been purposely introduced into the list so that comparison may be made between the mortality from fever in it as contrasted with the proportion of deaths from the same cause in other Districts of the Province which are not so situated.

North-Western Provinces.			Central Provinces.			Punjab.		
Districts.	Population.	Deaths from fever.	Districts.	Population.	Deaths from fever.	Districts.	Population.	Deaths from fever.
Saharanpore ...	866,483	11,189	Saugor ...	490,240	8,605	Goordaspore...	906,126	21,824
Mozuffurnugger...	682,189	10,541	Belaspore ...	530,541	10,060	Rawul Pindee.	699,647	16,532
Banda ...	724,872	12,960	Raepore ...	586,118	9,894	Hoshyarpore...	938,890	21,844
Bareilly ...	1,494,199	17,416	Jubbulpore..	428,669	6,791	Umballa ...	1,006,952	13,875

The comparison is not altogether fair, because registration is, I believe, much less imperfect in the Central Provinces and Punjab than it is in the North-Western Provinces, and the

proportion of deaths, which are not recorded at all in the North-Western Provinces, must be much greater than it is in these other portions of the country. But, allowing for this source of error, it is evident that the violence of the fever epidemic was not confined to tracts which are traversed by canals. Hoshyarpore and Saugor suffered very much more than Saharanpore; Rawul Pindee and Belaspore very much more than Mozuffurnugger; and the comparison in other cases shows little results. The epidemic was remarkable, not only because it was so wide-spread, but also because it attacked some places with greatest violence which are usually the most healthy.

The epidemic in the Punjab is not to be accounted for by the late and heavy rains.

72. In the Punjab fever contributed 272,946 deaths, or more than half the total mortality of the year. The death-rate from this one cause alone equalled 15·64 per 1,000. The proportion in different Districts varied from a minimum of 6·17 to a maximum of 24·08. In the early part of August, in may of the Districts, the epidemic commenced, it others in appeared in September, while others again did not suffer till October or comparatively escaped. The loss of life in certain parts of the country, as in Rawul Pindee, Hoshyarpore, and Goordaspore, was terrible, and the extreme prevalence of the disease prostrated the greater number of the inhabitants. The Civil Surgeons, who were consulted on the subject, were unanimously of opinion that it was due to "the late and heavy rains," assisted in some places by the weakly condition of the people caused by the high prices of food; but in my annual report for 1869, I pointed out that such an explanation does not meet the facts, and similar opinion is, I find, expressed by Dr. DeRenzy. There can be no question that up to the month of August, when the epidemic was so severe in many places, the rain-full had actually been less than in previous years when no fever prevailed.

There is no evidence to lead to the suspicion that the disease was other than malarious.

73. But while I coincide in the conclusion that the fever is not to be accounted for by the late and heavy rain, I cannot share Dr. DeRenzy's suspicion that it was not of a purely miasmatic origin, and that it may have been of the character either of that fever which, during that last ten or twelve years, has been recognized now and again in certain Jails of the Upper Provinces and the name of relapsing fever, or jail fever, or contagious fever, or of the same character as the fever, whatever may have been its nature, and I do not offer any opinion on this point, which proved so fatal to the prisoners of the Rawul Pindee Jail in 1869. Of this there is no evidenee. On the contrary, the statistics of European troops, of Native soldiers, and of prisoners within the area attacked, and the description of the disease as it came under observation in regimental and jail hospitals, show that it was of the same type as that ordinarily known as malarious fever. Dr. DeRenzy twice quotes Dr. Aitken's opinion that "agues have always been observed to be diseases of moist and marshy Districts," and argues that because Rawul Pindee, which suffered so severely stands on high ground and has excellent drainage, there is, therefore, good reason to believe that the disease was not malarious. But such an argument implies that our knowledge on the subject of malaria is already perfect, and yet any one who studies the statistics of communities occupying the same locality and living to all appearence under similar conditions from year to year, must be struck with the fact that fevers which are very rare during one season, without any accountable cause become very prevalent in another. And it must, I think, be admitted that we are still very ignorant of the conditions under which the epidemic prevalence occurs, whether they be of atmosphere or soil, or be dependent on other circumstances. The epidemic prevalence of fever is just as inexplicable as the epidemic prevalence of cholera. It is quite impossible to believe that the fever epidemic of 1869, which was so destructive over so large a portion of the North-Western Provinces, the Central Provinces, and the Punjab, and which was at its height in all of them about the same time, could have been spread by human intercourse, especially when we have the positive evidence that the cases of the disease, which came under intelligent observation, could not be distinguished from the ordinary fevers which occur every season, and are known under the common name of malarious.

The immense number of cases of fever represented by the mortality is no argument against its having been malarious fever.

74. Dr. DeRenzy argues that if the great mortality which was occasioned by fever in certain Districts of the Punjab had been due to the prevalence of the ordinary malarious disease, the number of cases must have been greater than can be readily believed. "Supposing the mortality from the disease," he says, "to be at the rate mentioned by Dr. Morehead (1·33 per cent. of attacks), it would have required upwards of 460,000 cases of fever to give the number of deaths that actually occurred in October alone in the Hoshyarpore District, the populaton being 938,890. In Rawul Pindee in would have required upwards of 330,000 cases, the population of the whole District being 699,647. Good medical treatment, no doubt, largely reduces the mortality from disease; but, on the assumption that the death-rate was even double that given by Dr. Morehead, the proportion of the population prostrated by fever must have been so large as to bring the business of the country to a stand-still." But, as a matter of fact, the business of the country was for a time seriously interrupted. The almost universal prevalence of

fever among the Native population of the Peshawur Valley was assigned as one of the chief causes which prevented the earlier removal of the European troops from the cantonment when attacked by cholera. When I visited Rawul Pindee in November 1869 I found that I could not carry out my intention of going the Murree, because the Post Office cart had ceased running for the season, and the bearers were prostrated by fever. There had been difficulty in obtaining forage for the horses cantonments, and agricultural operations, I was informed, had been seriously interfered with. It was said that at one time 80 per cent. of the whole population of the District were suffering from the epidemic. But more precise facts can be gathered from the statistics of European and Native troops at the same time. Dr. DeRenzy argues that if the deaths attributed to fever in the Hoshyarpore and Rawul Pindee Districts had been due to malarious fever, one-half of the population in round numbers must have suffered from the disease in the month of October alone. At Mean Meer, in the month of October, among the Native soldiers, as a matter of fact, there were 869 admissions into hospital from fever out of a strength of 1,386, much more than one-half. Among the European troops the admissions were 486 out of 922. At Rawul Pindee, in the same month, 700 Native soldiers gave 350 cases of fever, or just one-half. In the European corps the proportion was greater; at Peshawur, in the same month, out of 2,985 sepoys there were 1,611 admissions into hospital from fever. One of the most striking features of the epidemic was its extreme prevalence over certain areas. These figures certainly do not refer to different individuals. The same persons might be attacked with fever more than once even in one month, but it may be taken for granted that Dr. Morehead's statistics were framed on the same principle, and that his ratio of mortality was deduced from cases, not from separate persons.

The deaths in certain parts of Oudh from fever were very numerous.

75. In Oudh the deaths from fevers recorded were 87,795, or 7·8 per 1,000 of the population. From the general table in which these statistics are given, it seems that the disease was very prevalent in the Districts of Oonao and Roy Bareilly, where the mortality under this head equalled 14· per 1,000; in others, such as Pertabghur and Seetapore, the loss was enly 2 or 3 per 1,000. The distribution of the deaths by months is nor given, not is there any history of the disease.

In the Central Provinces there was a great epidemic of fever.

76. The Central Provinces show a mortality of 68,999 persons from fevers, or 39· per cent. of the whole mortality of the year. In his remarks on the epidemic, Dr. Townsend refers to the large element of error which is likely to arise under this head to which I have already alluded, and doubts whether it is advisable to attempt to register the deaths from fever separately, but with all its imperfections the information is still of great value. Dr. Townsend is of opinion that the fever of the hot season may, in great measure, be due to impurity of water while the extent to which the fever of the autumn months shall prevail depends on the rain.

"If the rain-fall has been abundant, and, more especially, if it has been continued late in September and October, the development of malaria will be great, and *vice versâ*. The seasons of 1868 and 1869 afford marked evidence on this point. In 1868 the average rain-fall of the monsoon over the whole Province was 15 inches below the average, and the deficiency was greatest in the months of September and October. The morning dews that usually prevail in the autumn months were light and soon ceased, the water in the wells was very little increased, and the sub-soil water remained at a considerable depth from the surface. Under these circumstances the development of malaria was unusually slight, and had comparatively little effect on the returns of mortality from fever. On the other hand, in 1869, the rain-fall of the monsoon was abundant, and, more particularly, the fall in September and October was more than double the average, and three times what it was in 1868, and the returns of the autumn months show a marked increase in the *mortality* from fever over the corresponding period of the previous year. This increased mortality, however, was not altogether due to the greater prevalence of malaria, for the malaria of these Provinces is not, under ordinary circumstances, directly fatal to life; but in 1869, in many Districts, a large portion of the population had been suffering from insufficiency of food from the commencement of the year, and many who had been able to drag through the hot weather succumbed under the climatic changes produced by the monsoon, and were carried off by attacks of fever which, under better circumstances, they would have been able to withstand."

The increased rain-fall, especially in the later months of the year as we have already seen does not solve the unusual occurrence of fever in the Punjab, and without a more detailed statement it is difficult to judge how far the two were connected in the Central Provinces. A comparison of the monthly rain-fall in each District in 1869 with that of 1868 is required, as well as a statement of the monthly deaths from fever in similar detail. As Dr. Townsend observes, the conditions which favor the development of malaria form a very difficult subject of study, and the special attention which he proposes to devote to it will, I doubt not, elicit some interesting particulars.

In the Madras Presidency fever was severe, and it prevailed most in the non-irrigated Districts.

77. In the Madras Presidency 132,346 deaths were attributed to fever, or a ratio of 5·3 per 1,000, a proportion very nearly equal to one-third of the whole mortality. The remarks of Dr. Cornish, the Sanitary Commissioner, on the epidemic are of much interest, especially in connection with the question of the influence of canal irrigation in favouring the prevalence of the disease, to which allusion has been already made.

"The year 1869," he observes, "has been remarkable for a considerable increase in the fever mortality of the population of the Madras Presidency.

"Fever has been specially fatal in the Districts of Godavery, of Kurnool, Vizagapatam, Cuddapah, Gangam, Malabar, and South Canara. The small population on the Neilgherry Hills, too, has suffered unduly.

"The highest mortality of all has occurred in the Godavery District (12·0 per mile), where a large tract of country is under canal irrigation. If a similar mortality had occurred in the adjoining irrigation District (Kistna), or in the delta of the Cauvery (Trichinopoly and Tanjore), where irrigation has been practised for many years, it would have become a question whether some connection might not have been traced between the accession of fever and the influence of canal irrigation; but, as a matter of fact, fever has been more prevalent and fatal in the Districts of Bellary, Kurnool, and Cuddapah for the past four years where there are no irrigation works to speak of, than in the Godavery District for the same time; while the irrigated Districts of Kistna, Tanjore, and Trichinopoly have had a fever mortality of *fifty per cent.* below that of the dry Districts just mentioned.

"The fluctuations in fever mortality in the several Districts deserve to be carefully studied from year to year. So far as the figures of the four years enable one to come to any conclusion, the causes producing fever would appear to be operative over widely-extended tracts of country at the same time, and to be in action for long periods together. It is noticeable that a high fever rate in Ganjam and Godavery has been co-existent with a similar high fever range in Lower Bengal, in Kurnool, and South Canara, places which are very wide apart."

No statistics are given to show the deaths from fevers in the Bombay Presidency.

78. The statistics of the Bombay Presidency do not afford any information on the subject of fevers. The deaths due to this disease are not separately entered, nor are any remarks made on this cause of mortality by the Sanitary Commissioner.

SECTION II.—D.

Bowel complaints and injuries are not generally commented on by the Sanitary Commissioners.

79. Bowel complaints and the various kinds of injuries as causes of mortality do not require special notice; for, although they are separately entered in some of the annual statements furnished by the Sanitary Commissioners, they do not find place in all of them, and, as a rule, no comments are made with regard to them. With the general introduction of the new forms, this want of information will be supplied, and the interesting facts, which may be elicited under these several heads, will, no doubt, invite attention.

SECTION III.

The *meteorology of the year* was remarkable.

80. This sketch of the history of the diseases, which chiefly contributed to the mortality of the different Provinces, rapid and imperfect as it has been, has occupied so much space that I must content myself with a very brief notice of the matters which remain to be discussed. The main facts regarding the meteorology of the year have been already recorded in my annual report for 1869, but they may be very briefly recapitulated here for the purpose of ready reference in connection with the general history of disease. In the Lower Provinces, Mr. Blanford shows that—"the most striking feature of the temperature of 1869, as compared with that of 1868, is the high range in the first five months of the year" ..... "the fall of rain was less than the average in Orissa, the Gangetic Delta, and Arracan, also in Eastern Bengal except Sylhet, and *probably* Cherra Poonjee, in Lower Assam, Sikkim, and parts of Behar, It was above the average at Sooree and Berhampore and over a tract of country stretching between the Rajmehal Hills and the Bhutan Dooars, including Dinagepore, Rungpore, and probably Julpigoree and Buxa. The rain-fall in Upper Assam seems also to have been in excess of the average, and it certainly was so in Sylhet." The meteorology of the North-Western Provinces is not discussed separately, nor are any statements of temperature, rain-fall, &c., given for the Province; but allusion is made here and there to the peculiar characters of the year. "The remarkable features as regards climate were a lengthened hot season, a dry ardent season, commencing early and extending far into what is usually counted as the rainy reason,—a delayed rainy season characterized by a rain-fall of more than average quantity, and ending in quite a flood of rain as late as the first ten days of October." No separate section of the Punjab report is devoted to meteorology; but a summary of observations in the Punjab by Dr. Neil, the Meteorological Reporter of the Province, is given as an appendix. There was the same general history here as in the North-Western Provinces,—a high and protracted temperature during the first five months of the year and a heavy rain-fall distributed over a comparatively

short period. In the report for Oudh, no mention is made of meteorology; but the subject has received much attention in the Central Provinces where observations are recorded in a certain number of stations under the superintendence of the Sanitary Commissioner. The general results for 1869, as compared with those for 1868, are thus stated by Dr. Townsend:

"The mean barometric pressure was greater in January, February, April, August, and November, less in the other months.

"The mean temperature was considerably higher in the first-half of the year, *i. e.*, in the spring and hot weather, lower in the rainy season and autumn.

"The mean humidity was less in the first-half of the year, considerably in excess during and after the rains. There was less cloud in May, the hottest month of the year. In the autumn the amount of cloud was greatly in excess over the season of 1868. This is a rather important point with reference to the relative prevalence of blight in the corresponding seasons of the two years.

"The rain-fall was less in the spring and hot weather, greater during the monsoon, and this was more especially the case in the months of September and October.

"In the general direction of the wind, there was no great difference in the two years. South and South-Westerly winds were to a slight extent more prevalent in 1869 in March and in September. The velocity of the wind was much the same during the hot weather in both years, it was considerably less in the rainy season, greater in October.

"The amount of ozone, as estimated by Schonbein's test, was generally less than in the preceding year, but greater in June, October, and November."

SECTION IV.

The food supply of the people.—This important subject has been discussed in a separate section only by the Sanitary Commissioner of the Central Provinces.

81. Dr. Townsend is the only one of the Sanitary Commissioners who has devoted a special section to the consideration of the food supply of the people, and the information which it contains is not only full of interest, but has a very important bearing on the sanitary history of the year. In the other annual reports, the subject does not receive the attention which it deserves; in some it is passed by altogether, in others only incidental mention is made of it, and yet there can be very little doubt that the famine in 1869, the effects of which were felt far beyond the area in which the crops had failed, had no small influence in favouring the spread of the great sickness of the year and in determining the excessive mortality which it occasioned.

SECTION V.

The record of *personal proceedings of the Sanitary Commissioners* is generally defective.

82. On hundred and one different places in the Lower Provinces were visited by the Sanitary Commissioner during the year. Dr. Smith mentions that he travelled 2,500 miles in the course of these inspections, and was absent from the Presidency on tour for nearly nine months out of the year. Great part of Dr. Planck's report is occupied with a description of 35 towns and cities which he inspected. The Sanitary Commissioners for the Punjab and Oudh append to their reports remarks made on the sanitary condition of certain towns which they visited, but there is no general record of any inspection tour. In the Central Provinces, although the movements of the Sanitary Commissioner are not detailed, Dr. Townsend visited a large portion of the country and minutely examined the circumstances attendant on the unusual prevalence of disease.

SECTION VI.

Sanitary Progress.—This subject has not been generally discussed in the reports.

83. Excepting in the Punjab Report in which Dr. DeRenzy has devoted a special section to "the Progress of Sanitary Improvement," the important question of what sanitary measures were either suggested or effected during the year has not received from the Sanitary Commissioners generally that prominent notice which it merits. The orders of the Government directing special attention to this subject had not reached them when their reports for 1869 were prepared. In future years full details will doubtless be given.

Dr. DeRenzy's remarks on venereal disease among European troops greatly under-estimate its importance as a cause of inefficiency among them.

84. Before concluding my review, I must refer to certain remarks on the subject of venereal disease and the measures which have been undertaken with a view to its prevention which have been made by the Sanitary Commissioner of the Punjab in a letter, copy of which forms one of the appendices of his report. Referring to the opinion of the Sanitary Commission of Bengal, as expressed in their annual report for 1864, an opinion on which all the rules and regulations for the prevention of venereal disease have been based, Dr. DeRenzy states that, in his belief, the evils attributed to this cause have been greatly exaggerated; that the means adopted to check them have failed, and that all measures intended to accomplish this object will meet with a like result. The point referred to the Sanitary Commissioner by the Government of the Punjab appears to have been not the advisability of attempting to protect European soldiers from this disease, for that question has already been fully discussed, and the necessity

for such preventive measures had forced itself on the attention of the Government, but simply how the measures which had been already in operation within the cantonments could best be extended to such of the neighbouring civil population, from among whom the soldiers were believed to contract the disease; how, in fact, the Sanitary Commissioner could best discharge one of the important duties which were originally assigned to him. Dr. DeRenzy has, however, discussed the question of the advisability of attempting any such protection at all, and his statements, which very imperfectly represent the facts, have, I understand, been claimed by the opponents of the Contagious Diseases Act in England as arguments why this Act should be abolished. In their report for 1864, which has been already referred to the Sanitary Commission for Bengal quoted the opinion of Dr. Duncan Macpherson, to the effect that "fully two-thirds of those who imbibe the disease are invalided within five years, and are sent out of the service with a loathsome poison circulating in their veins which passes down to their posterity." Taking the figures from Dr. Bryden's table, Dr. DeRenzy states that in the five years, 1864—1868, there were 36,879 admissions from venereal disease, and that the total number of men invalided on account of syphilis in the same period was 509. "According to Dr. Macpherson's estimate," adds Dr. DeRenzy, "the number would have been 24,586, supposing that each admission represented a distinct individual point on which I shall remark on hereafter." But, in using this argument, Dr. DeRenzy must have been aware, and, indeed, the sequel shows that he was perfectly aware, of the fact that the admissions do not and were never intended to represent distinct individuals. The proportion of admissions into hospital from any disease among every 1,000 men is a recognized and well understood standard of health statistics. It means simply that so many cases of illness occurred, it never professed to mean separate individuals, nor could such a meaning ever be properly attached to it. In one place Dr. DeRenzy quotes these admissions as if they represented separate individuals; in another place he insists on the well-known fact that the same man may be the subject of several attacks during the year, and so swell the number of cases. So far as I know venereal disease was never pointed to as one of the great causes of mortality in the European army in India, so Dr. DeRenzy's arguments in controversion of an assertion which appears never to have been made do not require notice. It is impossible to adduce any statistics to show how much of the annual invaliding is due to venereal affections, or how far the constitution of soldiers' offspring is impaired by the syphilitic taint of the parent. No statistics could supply this information, but any one acquainted with the British soldiers knows how frequently that deterioration of health which leads to death or discharge from the service, is traceable to the syphilitic poison. There is, however, one point in regard to which we have statistics, and that is the degree of inefficiency among European troops, which is directly due to venereal disease. In my annual report for 1868 I gave a table prepared by Dr. Bryden to show the amount of inefficiency caused by the chief diseases in each month of that year, and any one who doubts the prominent place which venereal affections hold in the returns of British Military Hospitals can refer to that table and judge of the results. It is shewn there that the average number daily inefficient from this class of diseases was greater than that from any other cause whatever. The general totals for the year are as follow:

DISEASES.	Average daily number inefficient from each disease.	Average daily inefficiency per cent. of strength.
Fevers	311	·99
Dysentery and Diarrhœa	98	·31
Hepatitis	98	·28
Respiratory Diseases	92	·29
Venereal Affections	365	1·16
All other causes	635	2·01
Total ...	1,590	5·04

And this return takes no account of the many cases of illness which were due indirectly to venereal disease. In 1869, out of a total average daily sick list of 1,985 during the year, 436 of the cases were due directly to venereal. In 1870, out of a daily average total of 2,017 men in hospital, the inefficiency was due in 430 of them to venereal. I do not under-

estimate the value and importance of sanitary measures for checking cholera, fever, and other diseases, but such measures will have no effect in diminishing the prevalence of that special class of diseases to which reference is now made. There may be differences of opinion on moral grounds as to the desirability of having any measures for checking venereal disease; there may reasonably be differences of opinion as to the best measures to be adopted for its prevention; but it seems hardly credible that any one acquainted with the facts should argue that this class of diseases is comparatively of so small importance that no means need be taken for its prevention at all. The returns for 1870 are not yet complete, nor have all the reports of the Look Hospitals for that year been received. Judging from the statistics of previous years during which the regulations for the prevention of venereal disease in military cantonments have been in force, I fully admit that the results have been most unsatisfactory, and that the amount of good which has been done was by no means so great as was to be expected; but these unsatisfactory results are due not to any defects in the system, but to the very imperfect manner in which the system has been worked. Wherever the civil and military authorities have energetically combined to give it a fair trial, the results have been very different.

The work which has been already done by the Sanitary Commissioners is of the greatest value.

85. The work of the Sanitary Commissioners, as a whole, so far as it is evidenced in their reports, gives much ground for satisfaction. Their duties may be stated broadly to consist of two great divisions,—1*st*, to obtain information regarding the sanitary condition of the people, the geographical distribution of disease, the nature and history of epidemics, the circumstances favorable to their spread, and the many other matters connected with the health of the population; and 2*nd*, to point out and urge the importance of the various sanitary measures which are needed. Under the first of these heads much has been done; the history of epidemic disease throughout India in 1869, imperfect as it is, presents a striking contrast to the absence of all information which attaches to former years. The data, the collection of which has been so well begun, will gradually improve and soon form the basis for most valuable generalizations. Knowledge of disease and of the circumstances under which it breaks out in violence must form the foundation of all progress, and in this view of the case what has been effected represents progress itself. Under the second head not much has been shown, but that arises in some measure from the fact that the Sanitary Commissioners have not specially discussed the question. No great sanitary engineering works, so far as I am aware, have been inaugurated during the year; but it would be wrong to estimate progress merely by such great improvements which can be executed only at the cost of much money and by special engineering skill. It will be some time before such works can really be done on any large scale, but mean time there is ample field for sanitary improvements in the towns and villages where much that is required can be done at little expense. The first step in sanitary reform is to teach the people its value, for without their assistance it is useless to expect any satisfactory results. If the suggestions which I have lately made for placing the health department on a wider and more efficient basis be approved, I believe that an important step will be taken towards this important end.

The several recommendations which have been made in this review are here recapitulated.

86. In concluding this review, the great length of which has in great measure been due to the very unhealthy character of the year to which it refers, I shall, for the sake of convenience, briefly recapitulate the various recommendations and suggestions which have been made in the course of it; and, as these may be conveniently considered in relation to one or other of the sections which I have adopted, I shall take the opportunity of showing clearly what these sections are, in the hope that the Sanitary Commissioners will follow the same arrangement. In preparing this review I have been more than ever struck with the importance of having these reports prepared on one uniform plan, not only because it will prove a great convenience to myself, but also because it will be a great convenience to the various Sanitary Commissioners in studying each other's works and to the public generally who may be interested in sanitary matters, and who may be anxious to compare the data contained in one with those which are to be found on the same subject in the others.

Suggestions for the preparation of sanitary reports on a uniform plan are here detailed.

87. Each sanitary report should, therefore, consist of six distinct sections, and under each of them the various points now to be detailed should receive prominent notice.

I.—The vital statistics of the Province.

The annual statements should be according to the standard, from which no deviation whatever should be made. If the population to whom registration has been extended does not embrace the whole population of the Province, the fact should be mentioned in a foot-note, and any discrepancy in the numbers of the whole Province, or of any District, as compared with those of the year previous, should be explained.

The figures should be punctuated by millions and not by lakhs.

Any statistics regarding births and marriages should be shown in separate statements from the mortuary tables.

Any measures for improving the registration which have been adopted during the year should be noted, and how far any improvement has been effected.

II.—History of the chief diseases during the year—

(*a*.)—Cholera.
(*b*.)—Small-pox.
(*c*.)—Fevers.
(*d*.)—Bowel complaints.
(*e*.)—Injuries.

With regard to each of them the facts should first be recorded, and then the opinions, if any, which have been based on them.

III.—The meteorology of the year.

The main features of the year should be shortly noted, and any connection which they appear to have had with its sanitary history discussed. The monthly rain-fall and temperature in particular should be compared with the monthly statistics of disease in each District, from which such data can be procured. The daily rain-fall and daily register of other meteorological phenomena in connection with the prevalence of epidemics are of much importance.

IV.—The food-supply of the people, as effected by the outturn of the crops, the rate of wages, and the prices of grain, and such information should, as far as possible, be given for separate Districts, in relation to the comparative mortality in each.

V.—A record of personal proceedings.

This should include a note of the various places visited during the year, although the special reports on each need not always be printed. The dates of such inspections should always be given for future reference. In connection with this point, I would observe that those tracts of country should generally be selected for inspection which have suffered from any unusual sickness in the preceding season, and an attempt should be made to investigate its causes on the spot.

It may be urged that the Sanitary Commissioners are too much occupied with the supervision of registration to be able to leave their head quarters for any length of time, but they can do much more to secure efficient registration by moving about the country than by any other means. They can interest District Officers and others concerned in the work, and can satisfy themselves as to the manner in wich the registers are kept. The mere prospect of their visit will stir up the Registrars to greater attention. And with all this advantage gained they can also do much to become acquainted with the country and with the people, and to enlighten them in the benefits of sanitary reforms. The details of compilation must be done by the Office Establishment, and the results checked here and there.

Under this head also mention may be made of any special reports which have been submitted during the year.

VI.—Sanitary progress.

This should be a record of any progress that has been made in the year not only as regards the projection or execution of any great engineering works, but also, as it concerns reforms of a minor nature, any means taken to instruct the people in their value and any sign that advance has been made in this direction.

And, in offering their remarks and opinions on these different heads, and on any other matters which deserve notice, the Sanitary Commissioners should abstain from criticizing the views of other officers in the same department. The fullest and freest discussion may be carried on with regard to any theoritical opinions, and the facts of the year may be considered in the light of these opinions without imparting to the discussion anything of a controversial nature, and without endeavouring to show that the views advanced by any other Sanitary Commissioner are erroneous or calculated to do mischief.

The reports should be submitted at a much earlier date than heretofore.

Each report should be provided with a complete table of contents, and with a clear map of the Province, in which the geographical distribution of cholera and its relative fatality in different places should be distinctly shewn.

Dr. Goodeve's plan of a map for showing the distribution and prevalence of cholera requires modification.

88. I believe, however, that the idea of furnishing such a map after the manner suggested by Dr. Goodeve and ordered by the Secretary of State, must be abandoned as impracticable. The Provinces are too large to be dealt with in this way, and every map which has been attempted on this system has been more or less a failure. The main object is to show at a glance the chief facts of the epidemic, but the innumerable circles and figures which are required to illustrate the history of an epidemic among the general population would lead to the greatest confusion. It is very desirable that the same method of indicating the results should be adopted in all parts of India, and that this method should be as complete as can be desired. I propose, therefore, to consult all the Sanitary Commissioners on the subject, and then to submit an improved design of map for the consideration and orders of the Government.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

IRRIGATION OPERATIONS OF LOWER BENGAL UP TO 31st OF MARCH 1871.

Circle.	Canal.	Water supplied during 1870-71: Full supply depth.	Estimated full discharge in cubic feet per second.	Average depth throughout the month.	Average discharge in cubic feet per second throughout the month.	Approximate area irrigated during 1870-71: District.	Area actually receiving water during the month, in acres.	Of column 8 area receiving water for the first time during current year.	Total of column 9A for all previous months of current year.	Total of columns 8A. and 9.	Rain-fall: Inches during month.	Inches up to date during the year 1870-71.	Average of ten previous years for the same period.	Navigation Return: Name of Traffic.	Number of Boats.	Tonnage.	Ton-mileage.	Approximate value of goods.	Chief Irrigation. Per column 8.	Per column 8A.	Remarks.
1	2	3	4	5	6	7	8	8A	9	10	11	12	13	14	15	16	16A	17	18	19	20
Orissa ..	High Level ..	..	..	..	..	Cuttack ..	..	..	22,035	22,035	·38	48·92	..	.....	..	..	..	..	....	....	Canal closed for repairs.
	Kendrapara ..	7	1,262	5·	741·	Ditto ..	2,686	308	69,362	69,670	·38	48·92	..	Local, inclusive of 5 passengers.	77	361	5,628	3,940	Cotton 1,905 Ploughing .. 100	Cotton 304 Mis. 4	Escape 72 cubic feet per second; canal closed from 13th.
														Through, inclusive of 21 passengers.	507	3,720	148,800	118,410	Mis. 681		
	Taldunda ..	8	1,300	7·25	125·	Ditto ..	..	..	22,150	22,150	·38	48·92	..	Local ..	62	872	1,860	3,880			
														Government ..	52	2,970	41,720	82,898			*On Midnapoor side, a considerable area called for water for the cultivation of teel; but Government was unable to supply them with water owing to repairs of canal going on, and so the cultivation was not attempted. † The cultivation of cold weather crops in 1870 proved an almost total failure on Panchkoorah side owing to salt water having entered the canal. The people were so discouraged that they did not attempt the cultivation this year. Range No. 1 closed on account of repairs to Oolabarriah Lock.
														Timber ..	..	..	..	33			
South-Western.	High Level, Midnapoor* ..	8	875	..	..	Midnapoor ..	..	..	29,114	29,114	6·5	56·45									
	Panchkoorah †	6	240	1·42	112·9	Howrah ..	..	..	878	878	5·05	..	..	Local, inclusive of 303 passengers ..	326	3,667	42,825	62,619			
	March 1870.					Total ..	2,686	308	143,539	143,847				Government ..	90	448	3,760	1,020			
Orissa ..	High Level ..	..	..	..	..	Cuttack ..	12	2	2,905	2,907											
	Kendrapara ..	..	..	..	..	Ditto ..	1,509	11	6,824	6,835											
	Taldunda ..	..	..	..	..	Ditto ..	..	..	..	..											
South-Western ..	Midnapoor ..	..	..	..	..	Midnapoor ..	20	5	12,961	12,986											
	Panchkoorah ..	..	..	..	..	Howrah ..	..	..	1,320	1,320											
							1,541	18	24,030	24,048											

The 8th June 1871.

T. M. KIRKWOOD, C. S.,
Canal Revenue Superintendent.

IRRIGATION OPERATIONS OF LOWER BENGAL UP TO 30th OF APRIL 1871.

Circle.	Canal.	Water supplied during 1871-72: Full supply depth.	Estimated full discharge in cubic feet per second.	Average depth throughout the month.	Average discharge in cubic feet per second throughout the month.	Approximate area irrigated during 1871-72: District.	Area actually receiving water during month, in acre.	Of column 8 area receiving water for the first time during current year.	Total of column 8A. for all previous months of current year.	Total of columns 8A. and 9.	Rain-fall: Inches during month.	Inches up to date during the year 1871-72.	Average of ten previous years and for the same period.	Navigation Return: Nature of Traffic.	Number of Boats.	Tonnage.	Ton mileage.	Approximate value of goods.	Chief Irrigation. Per column 8.	Per column 8A.	Remarks.
1	2	3	4	5	6	7	8	8A	9	10	11	12	13	14	15	16	16A	17	18	19	20
Orissa ..	High Level ..	..	..	..	..	Cuttack ..	..	..	..	..	5·77	5·77	1·64	....	..	..	..	..	..	..	Canals closed for repairs.
	Kendrapara ..	..	..	..	..	Ditto ..	..	..	..	..	5·77	5·77	1·64	....	..	..	..	..	..	..	
	Taldunda ..	..	..	..	..	Ditto ..	..	..	..	..	5·77	5·77	1·64	....	..	..	..	..	..	..	
South-Western ..	High Level, Midnapoor ..	8	875	..	..	Midnapoor ..	..	..	..	..	4·0	4·0	3·42								*Vide* remarks in March Statement. Canal closed for completion of earth-work.
	Panchcoora ..	6	240	3·65	15·28	Ditto and Howrah ..	..	..	..	..	5·05	5·05	Not known.	Local, inclusive of 168 passengers.	179	1,219	13,382	54,189	..	.	Ditto ditto ditto.
														Government ..	26	338	1,689	497	..	..	Ooloobariah range closed for repairs.
						Total ..	..	..	..	..											
	April 1870.																				
Orissa ..	High Level ..	..	..	..	..	Cuttack ..	15	15	..	15											
	Kendrapara ..	..	..	..	..	Ditto ..	931	931	..	931											
	Taldunda ..	..	..	..	..	Ditto ..	..	..	..	..											
South-Western ..	Midnapoor ..	..	..	..	..	Midnapoor ..	35	35	..	35											
	Panchcoora ..	..	..	..	..	Howrah ..	..	..	..	..											
						Total ..	981	981	..	981											

The 8th June 1871.

T. M. KIRKWOOD, C. S.,
Canal Revenue Supdt., Bengal.

Progress made in the construction of the Rohilkhund lines of the Oudh and Rohilkhund Railway, during the first quarter of 1871.

From CAPTAIN R. DEBOURBEL, R. E., Joint Secretary to the Chief Commissioner of Oudh, Public Works Department, Railway Branch, to the Secretary to the Government of India, Public Works Department, —No. 1034R., dated Lucknow, the 27th May 1871.

I AM directed to transmit the accompanying progress report for the quarter ending 31st March 1871 of the Rohilkhund Railways.

* * * * *

3. The Consulting Engineer inspected these sections with the Deputy Chief Engineer in February and March 1871, and reports steady progress, on the whole, in well-sinking, brick-making, and bridge-building. The earthwork is approaching completion, the collection of ballast is proceeding slowly, and plate-laying has commenced from the Allyghur end, the rails being linked in as far as Rajghât, but no sand-ballast having yet been laid.

4. Upwards of 500 wells from 8 to 16 feet diameter are in process of sinking, the greater portion with the ordinary Native jham, the more modern appliances are used at the large bridges only. In some instances the supply has been very deficient through the non-receipt of the plant indented for from England. Large local purchases have had to be made in consequence at high prices, and after serious delay. One item, diving-dresses and air-pumps, must come out from England; and, from every large bridge, there was the same complaint that work in some wells was stopped for want of diving dresses. The matter has been repeatedly pressed upon the Company, but without much effect. The result is, that the Engineers, finding great difficulties in sinking the wells down a sufficient depth into clay, kunkur beds, &c., are anxious to stop short upon the latter, which is a dangerous thing to do, as a loose sandy bed is almost sure to be in motion, or to be affected by the scour down to any hard stratum beneath.

5. This question of the depth of bridge foundations is engaging much attention on the part of all concerned. Speaking generally, the depth proposed is sufficient; but in the low valleys of the Ramgunga and Ganges, where the sub-soil is all sand, the depth proposed by the Deputy Chief Engineer of 30 feet below low water for the well foundations of the Undparee, Huringphundee, Pereia, and other similar flood-channels, is considered insufficient by the Consulting Engineer, who has directed them to be sunk 40 feet below water, if in sand, throughout for abutments and piers alike. He maintains that in these bridges the single well foundations must be founded to a greater depth than the cluster of wells in an ordinary bridge.

6. The expenditure is as yet well within the sanctioned estimates, the rates of cost are moderate, in some instances remarkably so, and generally a good spirit of economy prevails.

OUDH AND ROHILKHUND RAILWAY—ROHILKHUND LINE, AND ALLYGURH BRANCH.

Deputy Chief Engineer's Quarterly Progress Report,—No. 19, *dated Barielly, the* 31*st March* 1871.

ALLYGURH BRANCH—60·6 MILES.

MY inspection of this section, comprising works from Allyguih junction with the East Indian Railway to Chundowsie was made during the month.

The time it has now been under construction is for—

			Total.	Rains.	Full work.
Earth-work	...	... months	18	5	13
Brick-work	...	... „	12	4	8

On Division 4A—B, which extended to the Ganges the question of crossings of Futtehgurh Branch of the Ganges Canal remains still undecided, keeping 4½ miles of line work more or less in abeyance.

Earth-work is completed, with the exception of that to meet canal requirements above referred to.

Special Bridges.—Sinking has made slow progress, mainly due to the character of soil passed through; the Wells in South pier have at last reached their full depth, those in North pier have five feet further to be sunk, girders should be fixed by the end of July.

Ganges Canal.
2 No. 60 feet skew with.
2 „ 30 „ side openings.

Satisfactory progress was making at this bridge in well-sinking. Brick-making and all other arrangements were good, showing a marked improvement; and the girders should be in place by the end of September.

Kallee Nuddee.
5 No. 56 feet skew openings.

Choyea Nuddee.
4 No. 30 feet.

On wells, all of which are in position and sinking, fair progress making, and this should be completed by the 15th of October.

Futtehgurh Branch of Ganges Canal.

Work at this cannot be commenced, its position not having yet been decided: pure sand is met with a few feet below surface of ground, and the foundations will have to be on wells.

Small Bridges and Culverts, but few remain to be completed; all should be so by the end of season.

Plate-laying.—Twenty-five miles of permanent way are laid and linked in on formation level, leaving five miles to complete to the Ganges River, with short breaks at the Ganges Canal, Kallee and Choyea Nuddees.

Sand-ballast will have to be led by engine and ballast-train, and this is daily expected from Calcutta.

Telegraph has been completed through this Division.

Ganges Bridge.—Rajghât.—Number 33, 80 feet openings.

This work is making satisfactory progress. The bed of clay and kunkur met with in North abutment at a depth of 28 feet below low water, is also struck in every well yet sunk at the same level, extending completely across and forming this river's bed, it has been sunk into 10 feet, and for that depth is similar in character, although working through it is slow and expesive; it is favourable and advatageous in many other respects.

The completion of bridge is dependent upon progress made with sinking: this may be finished by June 1872; but it is doubtful if the piers could be built up to girder level by that date, and therefore the completion of this structure cannot safely be calculated upon earlier than January 1873.

Sanction for commencement of well-sinking was received in December 1869, and would thus be allowing three years under construction: the length of bridge is 3,052' 6".

On the section of this branch, which extends 30 miles beyond the Ganges to Chundowsie, and comprises our heaviest works, crossing the Ganges Valley with its flood inundations.

Earthwork.—Banks and cuttings completed, with the exception of backing-up to bridges in progress.

Small Bridges and Culverts.—Completed ready for girders.

Burdmar.
3 No. 56 feet with.
2 „ 30 „ side openings.

Special Bridges.—The pier wells are all sunk 30 feet below low water, and are in clay, through which progress is slow. The abutment blocks are also to this depth and into clay, all wing blocks down 20 feet.

Mahawa.
8 No. 56 feet openings.

The whole of the pier wells are sunk an average of 38 feet below low water. The North and South abutment wells to 30 feet below low water. All the South defence wells 12 feet, the North 20 feet.

Flood Chanels Jheel No. 1.
4 No. 56 feet openings.

Pier wells sunk to 37 feet below low water. North and South abutment wells also to 37 feet. The defence wells being down 12 feet.

Jheel No. 2.
5 No. 56 feet openings.

The South abutment wells sunk 37 feet below low water. At the North sinking commenced, the defence wells being down 8 feet. The particular attention of the Engineer has been called to these abutments, works and orders given to arrange to press on with them day and night, the pier wells cut off to 2 feet above low water being secure.

Cherere Jheel.
2 No. 30 feet openings.

Pier blocks sunk 15 feet, abutment blocks 25 feet, wing blocks 5 feet.

Chooca Nuddee.
4 No. 56 feet openings.

Pier wells sunk 35 feet, abutment wells 35 feet, the defence wall is to be on open foundations and will be built as soon as abutment well sinking is complete.

Sote Nuddee.
8 No. 56 feet.

Pier wells sunk to their full depth 45 feet, and concreting South abutment main well concreted, North abutment sunk 35 feet, wing well sunk 15 feet.

The abutments at all special bridges will, on the statements lately received from the Engineers in charge, be completed to above highest flood level on or before the 30th June.

Ballast.—The greater portion of the kunkur has been delivered, sand will be led by ballast-engine.

Plate-laying.—The permanent way between Ganges and Chundowsie will not be led up until after the rains, that is, the end of October, by that time it can be carried from Allygurh to Ganges by material-train.

With the exception of the Ganges bridge the rails should be laid and ballast-train working into Chundowsie by March 1872, thus giving 30 months under construction, of which 8 during rains and floods work is to a great extent suspended.

Shahjehanpore to Moradabad—116 miles.

This section was inspected towards the latter end of February.

Earthwork is, with the exception of backing to bridges, now completed.

Small bridges and culverts.—The greater number of these are ready for girders, and all will be finished before the rains.

Special bridges.—Very satisfactory progress has been made; the length of these girders

Gurra River.
18 No. 60 feet openings.
72' 6" girders.

was altered from 66' to 72' 6" in January of the present year, the curbs placed for the former had to be removed and some brickwork pulled down, 16 piers of the total number 17 have been sunk to an average of 18 feet below low water, and the sinking will be continued and all cut off before floods to low water level.

Orders have been given to press on the East abutment to check any tendency of the river cutting into that bank.

All piers are closely approaching the final depth to which they are to be sunk, and

Byghool.
6 No. 56 feet with 2-30 sides openings.

progress is therefore slow. One has been completed and concreted, the abutment blocks are down to 35 feet below low water.

Kibpea Nullah.
3 No. 30 feet openings.

Well-sinking in piers and abutments completed, well and piers, abutments and wings built up to 4 feet.

Nukhutea.
4 No. 60 feet skew.

Founded on blocks, all sunk to their full depth and in process of concreting.

Dejoura.
3 No. 56 feet openings.

Simple abutment, all wells sunk 33 feet below low water.

Underhea.
3 No. 30 feet.

On well sunk 27 feet, depth proposed 30 feet with drop walls.

Hurrunphunda.
4 No. 30 feet.

On wells sunk to 27 feet, depth proposed 30 feet with drop walls.

Kallassie.
6 No. 30 feet.

On wells sinking commenced.

Uril River (1st).
6 No. 30 feet openings.

Progress slow, partly due to short supply of bricks, all wells down 26 feet below low water.

Nawab Nullah.
8 No. 30 feet.

Pier wells sunk 28 feet below low water, abutment block in progress.

Uril River (2nd).
3 No. 56 feet openings.

Block abutment on wells, pier sunk 30 feet below low water, block abutment wells wing walls commenced.

Gunghun River.
10 No. 56 feet openings.

On wells all sunk to 30 feet below low water, wing wells commenced.

Ballast.—The greater portion of kunkur has been collected, sand has to be led by ballast-engine.

Plate-laying.—The cost of carting permanent way by road being a serious item of expenditure; this work is in abeyance pending delivery by rail. To expedite this it is intended

to construct a temporary bridge at low water level and lay down rails across the Ganges Rivet at Rajghât, and at other special bridges which may not have been completed, and this work will be taken in hand early in November.

Brick-making has, on the whole section, made satisfactory progress, the exception being between Ramgunga River and Aounlah, where the supply has not equalled the demand, owing partly to the large increase of water-way on this section.

With the exception of the Ramgunga Bridge, the rails should be laid over this section by December 1872.

Work makes good progress, better would have been attained with steam hoist for lifting

Ramgunga Bridge.
No. 36, 56 feet openings.

the large sand pump; none have been delivered to date. The Resident Engineer speaks very highly of Mr. Bull's hand-dredger as a valuable and useful implement for well-sinking through sand.

On the estimate forwarded by the Resident Engineer, this should be finished by February 1872, and there is every reason to hope this will be the case, if so the piers should be ready for girders by June 1872; these being available, the work should be completed by December 1872.

Sanction for well-sinking was received on 6th April 1870, the first well commenced on the 22nd, the time under construction has therefore been twelve months, during four of which work was suspended by rain and floods.

The portion of protection pitching East bank injured by last floods is being re-placed, and arrangement will be made to divert or ease the main current of river from this wall during next flood.

A project for the construction of a bund on West bank similar to that already constructed on East side, is in preparation and will be shortly submitted.

A survey of a river extending some distance above and below bridge site has been completed for record.

Lucknow to Shahjehanpoor,—101 miles.

This section was inspected during the month of February.

Work on banks and cuttings, minor bridges and culverts with preparation of material, was sanctioned on 17th March 1870, but Engineers were not available for 3rd and 4th Sub-Divisions until May. A portion only of the first working season may be considered as past.

Sanction for special bridges was received on the 1st February of the present year, one month from date of this report.

Earthwork.—Banks and cuttings finished. Some consideruble portion has not as yet had a season's rain since completion.

Brick-making has been carried out by the Company's Engineers, and with good results both in quality and quantity.

Small bridges and culverts.—For the first 30 miles out of Lucknow, the greater portion of these are either completed or in progress; from that point in to Shahjehanpoor, work is not so well advanced, but good progress may be calculated on before the commencement of the rains.

Canal Bridge.
1 No. 60 feet skew.

Special bridges.—Open foundation, built to 10 feet under formation.

Bettah River.
4 No 56 feet openings.

(1.) Well foundations 30 per cent. of sinking executed, and the work is estimated to be completed to flood level by the end of June.

(2.) Open foundations concreted and brick-work in piers, abutments and wing walls

Bettah River.
2 No. 30 feet openings.

built 8 feet above that level, with every prospect of completion to formation level before the rains.

Saie River.
3 No. 56 feet openings.

Well foundations, work commencing.

Sookheeta River.
4 No. 30 feet openings.

Well foundations, curbs placed, bricks and other material on ground.

Kuhnout River.
10 No. 56 feet openings.

All pier wells started and sinking, a good stock of material on ground.

Ballast.—A considerable percentage of kunkur and broken bricks has been collected and stacked. Sand will have to be led by engine and wagons from pits.

Plate-laying.—A commencement and junction into the Lucknow and Cawnpoor Line has been made: work will be carried on telescopically from that point.

This section of line should be completed to the Kuhnout Bridge, near Shahjehanpoor, by June 1872.

Ramnuggur Branch.—Plans and estimates are before Government.

General.—My inspection tour extended from latter part of January to the end of March, the whole of the line and every bridge and culvert under construction visited. Close attention has been given to the quality of the mortar, samples of which are taken weekly from that in use on each sub-divisional section and preserved as official records at each Engineer's Office.

The general health of the staff has been good, and no changes made during the month.

Returns shewing details and percentage of work executed are forwarded herewith.

From the Government of India, Public Works Department, to the Chief Commissioner of Oudh,—No. 1179R, dated Simla, the 7th July 1871.

I AM directed to acknowledge the receipt of your Joint Secretary's letter No. 1034R of the 27th May last, submitting the progress report of the Rohilkhund Railways for the first quarter of 1871.

2. The information furnished by the Deputy Chief Engineer is very complete and of great interest, and I am directed to express the satisfaction of the Governor General in Council at the vigorous manner in which the works have been prosecuted by Mr. Lovell and his staff.

GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Tuesday, the 11th July 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding.*
His Honour the Lieutenant-Governor of the Panjáb.
His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.
The Hon'ble John Strachey.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major-General the Hon'ble H. W. Norman, C. B.
The Hon'ble F. R. Cockerell.
The Hon'ble R. E. Egerton.

The Hon'ble MR. EGERTON took the oath of allegiance, and the oath that he would faithfully discharge the duties of his office.

OATHS AND DECLARATIONS AMENDMENT BILL.

The Hon'ble MR. STEPHEN, in moving for leave to introduce a Bill to amend Act No. V of 1840 (concerning the oaths and declarations of Hindoos and Mahometans), said that the measure had been necessitated by the discovery of

one of those small inaccuracies which it was so difficult to escape in legislation, but which were calculated to produce inconvenience. Act V of 1840, by which at present the subject was regulated, was so worded as to be applicable only to the case of witnesses in Court. It was desirable, however, that the substitution of a solemn affirmation for an oath should be lawful in other cases, besides that of witnesses, as, for example, jurors in criminal cases tried by juries, and under the Coroners' Act, 1871. The object of the proposed measure was to extend Act V of 1840 so as to embrace such cases.

The Motion was put and agreed to.

BRÁHMA MARRIAGE BILL.

The Hon'ble MR. STEPHEN, in moving to add the Hon'ble Mr. Strachey to the Select Committee on the Bill to legalize marriages between members of the Bráhma Samája, wished to take the opportunity of making a few observations as to the present position of the Bill. The matter was one of great delicacy and importance, and some explanation appeared desirable as to the course which had been pursued with respect to it. The Bill, which was originally brought forward by his predecessor (Mr. Maine), would have had the effect of establishing a system of civil marriage for all classes in India. This step was justly considered one of extreme importance, and the opinions of all the Local Governments were requested with reference to it. Their opinions were, in many instances, unfavourable to the proposed measure; but it appeared to be generally thought that there would be no objection to a measure which would meet the wants of any individual sect, such as the Bráhma Samáj. A Bill, thus restricted in its scope, was framed accordingly, and published in the Gazette. Thereupon, a deputation had represented that there were great objections to it on the part of many members of the sect. This was entirely new to him (MR. STEPHEN), as he had supposed that the whole of the Bráhma body wished for a Bráhma Bill, if the general Bill could not be had. He had accordingly promised to wait for three months before proceeding with the Bill. Just before the end of the three months there had come another deputation with memorials, the signatures to which were alleged to amount to 2,000, objecting strongly, for reasons set forth in their petition, to the passing of any Bill at all on the subject. Under these circumstances, there seemed but one course open to him, namely, to promise to postpone any further dealings with the Bill till the Government returned to Calcutta, when the representatives of the two opposite factions of the Bráhma sect might be confronted, and the real wishes and objects of each be ascertained. There had been warm discussion in the papers, and the advocates of the measure—progressive Bráhmas as they were called—had complained vehemently at the delay of three years which had occurred in dealing with the measure; their complaints were certainly not altogether unnatural. Many personal imputations had been made, which MR. STEPHEN had been sorry to see, but of the justice of which he individually knew nothing. MR. STEPHEN himself had been blamed for delaying to pass the Bill now in deference to objections which the Committee was supposed to have considered before it submitted its report, which objections were contained in a memorial submitted to them in 1868 by the Adi Bráhma Samáj. The fact was, that the memorial in which those grounds were urged, though mentioned in the list of papers referred to in the margin of the report, had never come before him, though it had apparently been considered by the Committee as originally constituted and probably formed one at least of the reasons why the Bill had been thrown originally into a general form. The Bill, as brought to his notice, was a general Civil Marriage Bill, and all the papers before him discussed the propriety of a measure of that nature. There was nothing in any of them to show the existence of any difference of opinion between different sections of the Bráhmas as to a Bráhma Marriage Bill. It was quite true that he had signed the report which stated that the Committee had examined a

number of papers mentioned in the margin, of which the memorial of the Adi Bráhma Samáj was one; but he individually had never seen that paper. The papers which he did see referred to the general measure exclusively. The difficulty was really a very considerable one, owing to the divided condition of the sect, and their opposed wishes on the matter. Any class of persons practically debarred from marriage by their religious belief, certainly seemed to be entitled to legislative relief; but it was one thing to meet the wishes of a small body of persons, and another to make a change which might be regarded in the light of a direct attack on the institutions of the country. When the wishes of the two contending parties among the Bráhmas had been ascertained, an opportunity would be taken of announcing the course which Government intended to pursue with reference to the subject, and of stating the form in which whatever relief it might be considered necessary to give, would be given. Apart, however, from this, the character of the new memorials submitted to him was such that he considered himself bound to get, if possible, to the bottom of the matter, even at the expense of a delay which he regretted, and the case was emphatically one in which it was a less evil to go too slow than to go too fast.

The Motion was put and agreed to.

GENERAL REGULATIONS AND ACTS (DEHRÁ DÚN) BILL.

The Hon'ble MR. COCKERELL moved that the Report of the Select Committee on the Bill to bring the Dehrá Dún within the operation of the General Regulations and Acts be taken into consideration. He said that the Bill, as introduced, was framed on the assumption that, although the result of previous legislation in regard to the Dehrá Dún had been to leave it not subject to the General Regulations and Acts, the District had, in fact, since the passing of Regulation V of 1829, been administered as though such enactments were legally in force there. It had since been ascertained that, even if such was the case as regards a large majority of the enactments in force in the Regulation Districts, it was not so in regard to all.

For example, up to the occurrence of the case of Dick *v.* Heseltine, during the year 1868, it would appear that Act X of 1859 was held not to be in force in the Dún, and that it was the practice in all matters relating to rent to follow the old 'Summary Suit' Regulations, as they were called, which were superseded, and, in fact, expressly repealed by the said Act.

Why that Act, which was obviously designed to take the place of the 'Summary Suit' Regulations and to be the rent law wherever the latter were in force at the time of its enactment—for it contained no other indication of its intended local extent—was supposed not to be applicable to the Dún, previously to the occurrence of the case to which he had referred; and why it was then suddenly treated as though it were in operation in that tract, he was unable to discover.

In this curiously confused state of things provision had to be made for curing the possible invalidity of two classes of past proceedings on the part of the Courts heretofore exercising jurisdiction in the Dehrá Dún District,—(1*st*), decisions and orders passed on the supposition that the General Regulations and Acts constituted the law of the Dún, and, (2*nd*), decisions and orders governed by the 'Summary Suit' laws which were repealed by Act X of 1859.

We had at the same time to maintain the legality of proceedings which might have been held on the authority of the High Court's ruling in the case of Dick *v.* Heseltine, to the effect that the General Regulations and Acts were not legally in force in the Dehrá Dún.

The first section of the Bill had been re-cast so as to secure those objects. It purported to set up whatever had been done in accordance with any Regulation or Act, repealed or unrepealed, without, at the same time, invalidating what had been done at any time not in conformity to any such enactment.

The only other alterations contained in the amended Bill related to the jurisdiction of the Courts and Chief Revenue Authorities. It had been found necessary to confer jurisdiction within the Dún upon the High Court and Board of Revenue in express terms. The mere extension of the Regulations and Acts would have been insufficient to give that jurisdiction.

The local limits of the High Court's ordinary jurisdiction were identical with those of the former Sadr Adálat. The local jurisdiction of the latter was derived from Regulation VI of 1831; that of the Board of Revenue from Regulation X of 1831. In both those Regulations the local jurisdiction was defined by reference to another Regulation (I of 1829), and the latter contained no mention of the Dehrá Dún District.

So also as regards the District Court of Saharunpúr. That Court had for many years past exercised, and still continued to exercise, jurisdiction within the Dún without any legal authority. The third section had been added to give retrospective validity to its proceedings, and to reserve a right of appeal within the period allowed by the law of limitation in cases in which the decision or order of the Court of first instance might have been passed before this Act came into operation.

In the settlement of these details, the Select Committee had had the advantage of personal consultation with Mr. Jardine, the Government Advocate of the North-Western Provinces, who, having been professionally engaged in the case out of which this legislation had arisen, was thoroughly conversant with the several points of difficulty presented by the High Court's judgment in that case; and he (MR. COCKERELL) might say that Mr. Jardine fully concurred in the opinion of the Committee that the amended Bill effectually provided for the rectification of all past irregularities.

The Motion was put and agreed to.

The Hon'ble MR. COCKERELL also moved that the words "in the said district" be inserted after the words "proceeding had" in the sixth line of section one.

The Motion was put and agreed to.

The Hon'ble MR. COCKERELL then moved that the Bill as amended be passed.

The Motion was put and agreed to.

The Council adjourned to Tuesday, the 18th July 1871.

H. S. CUNNINGHAM,

SIMLA;
The 11th July 1871.

Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

No. 27 of 1871.

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, JULY 22, 1871.

OFFICIAL PAPERS.

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GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Tuesday, the 18th July 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding.*
His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.
The Hon'ble John Strachey.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major-General the Hon'ble H. W. Norman, C. B.
The Hon'ble F. R. Cockerell.
The Hon'ble R. E. Egerton.

EUROPEAN VAGRANCY ACT AMENDMENT BILL.

The Hon'ble MR. STEPHEN introduced the Bill to amend the European Vagrancy Act, 1869, and moved that it be referred to a Select Committee with instructions to report in three weeks. He said that he had, on moving

for leave to introduce the Bill, explained the causes which necessitated the changes now proposed. It was unnecessary for him, on the present occasion, to trouble the Council with any further remarks.

The Hon'ble MR. ELLIS said that the records of some recent proceedings of the Madras Government confirmed the view that some such measure as the one now introduced was urgently wanted. It appeared from those proceedings that the Madras Government had had to deal with some twenty loafers, the majority of whom were of the very class in question, and the Government had been obliged to pay for the carriage of those men back to Australia. The fact that the Bill was as much needed in Madras as at Calcutta might, he thought, be new to the Council.

The Hon'ble MR. COCKERELL said that he trusted that it was not intended that the proposed amendments of the law relating to European vagrancy should come into operation until a sufficient period had elapsed to admit of the consignors of horses, in charge of which the persons to whom this Vagrancy Bill related were sent to Indian ports, becoming aware of the responsibility which they, through their agents or consignees, would thenceforth incur in sending such persons to India, and regulating their conduct in this matter accordingly.

It might be that his hon'ble and learned friend in charge of the Bill contemplated some provision to that effect; but, as he had not announced it, he (MR. COCKERELL) thought it necessary to draw attention to the point, as any doubt as to the intention of the framer of the Bill in that matter might subject the measure to the imputation of undue harshness.

MR. COCKERELL also wished to enquire whether the Government was in possession of any information as to the antecedents of the persons whose vagrancy had suggested the need for the present Bill. It would be remembered that, by the twenty-fifth section of the Vagrancy Act, provision was made for the imposition on the Master or Captain of any vessel conveying a discharged convict to India, of a sufficiently heavy fine to cover the cost of such person's deportation in the event of his becoming a vagrant.

He believed, he might say, that that provision was introduced into the Act in special reference to the class of persons sent from the Colonies to India in charge of horses. The majority of that class notoriously represented the refuse of the colonial population, men who would not come to India, where there was little or no prospect of their obtaining permanent employment, without any provision for their return journey, if they could obtain an honest livelihood at the Colonies.

It was with the well-ascertained fact before the Council that that class had largely supplied the ranks of vagrancy for which they were legislating, that that provision had been enacted; and what he now desired to learn was whether due care had been taken to give effect to its object, for it seemed to him that, if this Bill was to be passed without further enquiry and another means thereby secured of meeting the difficulty which that provision was chiefly designed to obviate, there was great risk of the penal enactment being wholly overlooked and becoming a dead letter.

The Hon'ble MR. STEPHEN said, in reference to the remarks of his hon'ble friend (Mr. Cockerell), that the Bill had been brought forward at the earnest recommendation of the Bengal Government, with a view to checking the arrangements by which the Australian exporters and the firms employed by them as agents for the sale of their horses, at present contrived to evade the law. Those persons knew perfectly well what they were about, and there was no particular reason for showing them much indulgence. They had shown some ingenuity in rendering the law inoperative, and the object in view now was to provide that the intention of the Legislature should be carried out. There could

be no doubt, that when horses were imported into this country in charge of grooms, and those grooms immediately became vagrants and were thrown on the public for support, the importer of the horse was the proper person to pay. The only way to get at the importer was to make the various persons, whom the owner employed in this country in connection with the sale of the horses, responsible.

With regard to the second point referred to by his hon'ble friend, MR. STEPHEN said that the Bengal Government were fully alive to the evils entailed by the present system, and would be very unlikely not to put section twenty-five of the Act into force whenever opportunity afforded. It might often, however, happen that cases might require to be dealt with, to which the provisions of that section would not apply, and the present Bill was intended to meet those cases.

His Excellency THE PRESIDENT suggested that the Committee should have instructions to report in four weeks.

The Motion was put and agreed to.

CRIMINAL TRIBES BILL.

The Hon'ble MR. STEPHEN also moved that the Hon'ble Mr. Egerton be added to the Select Committee on the Bill for the registration of Criminal Tribes and Eunuchs.

The Motion was put and agreed to.

LOCAL EXTENT ACTS BILL.

The Hon'ble MR. COCKERELL asked leave to postpone his Motion for leave to introduce a Bill for declaring the local extent of the Acts of the Legislative Council of the Governor General.

Leave was granted.

PENSIONS' BILL.

The Hon'ble MR. COCKERELL then moved that the Hon'ble Mr. Egerton be added to the Select Committee on the Bill to consolidate and amend the law relating to Pensions.

The Motion was put and agreed to.

NORTHERN INDIA CANAL AND DRAINAGE BILL.

The Hon'ble MR. STRACHEY moved that His Honour the Lieutenant-Governor of the Panjáb be added to the Select Committee on the Bill to regulate the construction and maintenance of public works for Irrigation, Navigation and Drainage. He said that he was anxious, with His Excellency's permission, to say a few words in explanation of the course which had been pursued with reference to the Bill. Considerable progress had been made by the Select Committee in the consideration of various details of the Bill before the Government left Calcutta. Much, however, still remained for disposal, and it appeared that there were such serious differences of opinion in the Committee as to several points, that Colonel Strachey, who had charge of the Bill, recorded his opinion in a paper which was before the Council, that, so far as the North-Western Provinces were concerned, it was expedient to abandon the proposed legislation altogether and to confine the operation of the present Bill to the Panjáb, where the Irrigation Department was anxiously asking for the measure, and where the Lieutenant-Governor was understood to approve of it and to consider its immediate introduction a matter of importance. It was thought, too, that, if the Bill was restricted to the Panjáb, there would be

especial propriety in proceeding with it at Simla, where they had the advantage of the presence of His Honour the Lieutenant-Governor and of a large number of experienced officers. This view was much strengthened when his hon'ble friend, Mr. Egerton, became a member of the Council. Although he (MR. STRACHEY) had at one time been disposed to think the conclusion inevitable, that the only practicable course was to confine the measure to the Panjáb, circumstances now seemed to be different. A letter had been addressed to the Government of India by that of the North-Western Provinces, in which it was stated that His Honour the Lieutenant-Governor "observed, with much regret, that the Bill for regulating Irrigation in Upper India had not yet passed into law;" that serious loss and inconvenience arose from the delay; and that the passing of the Bill with all possible expedition was earnestly recommended. The letter went on to say that till the Bill was passed, the Government had no legal control over beds of rivers, and could not interfere with private dams, however desirable on public grounds such interference might be; and, moreover, that considerable loss of income had resulted from the present defective condition of the law. From this letter MR. STRACHEY inferred that the objections which were supposed to exist to the extension of the Bill to the North-Western Provinces, had no valid grounds. The Bill would, therefore, be now proceeded with in Committee, and as it had at any rate, in regard to most of its principal provisions, the approval of the Lieutenant-Governors of both Provinces, he trusted that no difficulty in dealing with it need be apprehended. Mr. Egerton had consented to take up the Bill, and his experience and knowledge of the subject would give the Council and the public full assurance that it would be dealt with in a wise and careful manner.

The Motion was put and agreed to.

SUNDRY BILLS.

The Hon'ble MR. STRACHEY also moved that the Hon'ble Mr. Egerton be added to the Select Committee on the following Bills:—

To regulate the construction and maintenance of public works for Irrigation, Navigation, and Drainage.

To consolidate and amend the law relating to advances of money by the Government for the improvement of land.

To facilitate the construction of works of public utility from Local and Municipal Funds.

The Motion was put and agreed to.

LOCAL PUBLIC WORKS BILL.

The Hon'ble MR. STRACHEY also, with His Excellency's permission, moved that the Hon'ble Mr. Ellis be added to the Select Committee on the Bill to facilitate the construction of works of public utility from Local and Municipal Funds.

The Motion was put and agreed to.

The following Select Committee was named:—

On the Bill to amend the European Vagrancy Act, 1869:—The Hon'ble Messrs. Ellis, Cockerell and Egerton and the Mover.

The Council adjourned to Tuesday, the 25th July 1871.

H. S. CUNNINGHAM,
Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

SIMLA;
The 18th July 1871.

GOVERNMENT OF INDIA.
PUBLIC WORKS DEPARTMENT.

IRRIGATION OPERATIONS OF FUSL KHURREEF IN THE NORTH-WESTERN PROVINCES UP TO 31st MAY 1871.

CANAL DIVISIONS.	Water distributed during the month.	Depth in Canal at Regulating Gauge.	Gross Consumption, cubic feet per second.	Nature of Traffic.	Navigation Returns, Ganges Canal. Up.	Down.	Total Up and Down.	Land irrigated (approximate). Zillah.	Acres.	Rain-fall. Total from the 1st April to 31st May.	Average of ten previous years for the same period.	REMARKS.
	Full supply, feet.	Actual throughout, feet.	Estimated full supply.	Actual average throughout.	Mds.	Mds.	No.					
Ganges Canal: Northern	10·00	9·17	710	668				Saharunpoor	10,236	1·27		Ganges Canal. The mean volume passing Roorkee gauge during the month was 5,546 cubic feet per second. Volumes discharged— Etawah Branch Tail 24 c. ft. per second. Escapes 281 ,, ,, Cawnpoor ,, Tail 222 ,, ,, ,, ,, Escapes 190 ,, ,, Total 717 ,, ,, There was little demand for water in the terminal divisions, owing to frequent and occasionally heavy showers of rain which fell at intervals throughout the month. In the upper divisions there was a considerable demand during the first ten days: it subsequently decreased slightly, but remained fair until the close of the month. Water was chiefly required for the irrigation of indigo, sugar-cane, and cotton pulse. Occasional showers during the month, and heavy rain on the 28th and 29th.
Meerut	8·10	7·40	1,087	840				Moorad	22,507	1·1	1·00	
Puttehgurh	6·00	5·29	667	425				Bolundshuhur	45,602	3·1	3·56	
Boolundshuhur	6·35	6·20	983	913				Allygurh	22,027	1·4	1·06	
Allygurh	5·00	5·40	1,053	617				Mutra	35,459	0·6	0·96	
Etawah†	4·00	3·28	771	679				Agra	5,196	3·1	0·64	
Cawnpoor†	6·20	3·90	958	647				Etah	433	4·7	0·35	
Total	..	..	6,129	4,809				Mynpoorie	9,732	2·0	0·63	Eastern Jumna Canal. During the early part of the month there was great demand (almost exclusively for sugar-cane), but it was temporarily diminished by a fall of rain on the 9th, after which there was a steady demand till the 28th, when there was a heavy fall of rain in the lower half of the canal. Three breaches occurred in the canal during the month, and it had in consequence to be closed on two occasions, *viz.*, for a few hours on the 12th, and for two days on the 24th and 25th. Occasional showers throughout the month. Wind variable.
Eastern Jumna Canal	..	..	..	852				Futtehgurh	7,758	0·5	0·57	
Doon Canals	..	..	..	44				Etawah	5,710	3·2	0·86	
Bundelkhund Irrigation Works	..	..	..	..				Cawnpoor	12,506	2·6	0·48	
Rohilkhund Canals	..	..	..	196				Debra Doon	16,177	1·4	0·64	Doon Canals. Good demand on the Beejapoor, Rajpoor and Kullinga watercourses. Little demand on the others, owing to frequent showers which fell during the month.
								Bijnour	2,425	2·2	2·69	
								Total	348	1·8	1·32	
									302	0·6	0·74	
								Torai	4,102	3·9	1·40	
								Bareilly	81	0·7	0·34	
								Jhansie	287	0·8	0·45	
								Humeerpoor				Rohilkhund Canals. Slight demand for irrigation during the month.
								Total	201,577	..	..	Bundelkhund Irrigation Works. Demand merely nominal.
								Fusl Khurreef, 1869-70, to 31st May 1870	221,943	..	..	Traffic Returns. Slight increase in the carriage of food-grains. Large increase in the building materials, which, however, consisted almost entirely on account of accidents to the Jhelum and Bolra Locks, both of which are closed for repairs.
								Decrease, 1871	30,366	..	..	

	Navigation Returns, Ganges Canal. Up. Mds.	Up. No.	Down. Mds.	Down. No.	Total Up and Down: Mds.	Total Up and Down: No.
Grains—						
Barley	..	..	500	..	500	..
Gram	..	..	711	..	711	..
Wheat	..	..	1,100	..	1,100	..
Moong	..	..	50	..	50	..
Urhur	1,282	..	..	..	1,282	..
Dhan or paddy	..	..	25	..	25	..
Rice	1,329	..	..	..	1,329	..
Gram	727	..	..	..	727	..
Total	3,318	..	2,386	..	5,704	..
Cotton	..	19	3,048	..	3,048	..
Oil-seeds	..	363	12,846	..	12,865	..
Salt	..	7,182	7,105	..	7,523	..
Metals	..	277	873	..	8,055	..
Building materials	..	2,669	3,907	..	4,084	..
Miscellaneous goods	..	770	8,378	..	11,047	..
Firewood	..	..	27,424	..	28,194	..
Bamboos	..	..	..	1,479,768	..	1,479,768
Tons or Bullocks, unsquared timber	..	..	..	11,541	..	11,541
Kurrees, squared timber	..	..	253	17,388	..	17,588
Logs	..	..	12	1,410	..	1,422
Miscellaneous timber	..	..	2	879	..	881
Live-stock	..	..	25	93	..	118
Total	14,598	290	65,927	1,510,979	80,525	1,511,269
Fusl Khurreef 1869-70, to 31st May	9,556	12,947	80,847	724,875	90,408	737,822
					+9,578	−773,447
						9,878
Net Decrease	..	..	..	..	..	763,569

* Gauge readings are now taken on the Solani Aqueduct. † The Etawah and Cawnpoor Branches have alternate weeks of high and low supply.

P. S. MARINDIN, *Capt., R. E.,*
Asst. Secy. to Govt., N.-W. P., Irrigation Branch.

ALLAHABAD;
The 20th June 1871.

No. 28 of 1871.

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, JULY 29, 1871.

OFFICIAL PAPERS.

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GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

FISHERIES OF PORT BLAIR.

Resolution by the Government of India in the Department of Agriculture, Revenue, and Commerce,—No. 6, dated Simla, the 27th July 1871.

READ again—

Dr. Day's Report on the Fisheries of Port Blair, published in the Supplement to the *Gazette of India* of the 11th June 1870.

Read also—

Paragraphs 11 to 13 of the Resolution of the Government of India in the Home Department, Nos. 11-17, dated the 4th January 1871.

Letter from the Home Department, to Colonel H. Man, Superintendent of Port Blair and the Nicobars, No. 442, dated the 21st January 1871.

RESOLUTION.—**Dr. Day's report having been published, the Governor General in Council considers that the orders thereon cited above should also now be published in the Supplement to the *Gazette of India*.**

Extract paragraphs 11 *to* 13 *of the Resolution of the Government of India in the Home Department,—Nos.* 11-17, *dated the* 4*th January* 1871.

11. THE Governor General in Council has carefully perused Dr. Day's report regarding the fisheries of Port Blair, and the explanations furnished by Colonel Man. His Excellency in Council has also had under his consideration the remarks made by Dr. Rean, on the subject in his annual report. Admitting all the facts stated by Colonel Man, there is still sufficient

ground for Dr. Day's general view that the resources of the Settlement, as regards fish, are not properly utilized. It has never been laid down that the convicts shall always have *fresh* fish supplied to them. There is no doubt that fresh fish will not always be available, and that fresh fish are apt to spoil in hot weather, yet this is exactly the condition of things in British Burmah, where the bulk of the daily food of the people consists of fish.

12. The Governor General in Council considers that some system might be established to preserve the surplus fish, and to prevent it from being wasted. What is wanted is, that there should be an effort to catch fish on a larger scale, and means provided for regularly preserving all that is not sold when fresh. The Governor General in Council does not apprehend that there should be any difficulty in the matter. The resources of the Settlement for the supply of fish seem to be unlimited; all that is required is to *catch* more; and to do this it is only necessary to employ a larger establishment of convict fishermen. Salt is available apparently at a cost of about a half penny a pound, and possibly, if more extensively made, might be cheaper still. Wood is available in abundance for smoking. If, therefore, a regular establishment were kept up at which all surplus fish could be smoked or salted, or both, as soon as caught, there ought to be no difficulty in having a ration of fish, *either fresh* or *preserved*, every day for the entire convict population.

13. On one point, in regard to this subject, Colonel Man no doubt is right. The contract made by Captain Laughton does not seem to be so improvident as Dr. Day's report made it appear, and the system enforced by him is not, in the opinion of the Governor General in Council, deserving of the condemnation pronounced upon it in Dr. Day's report, which appears to have been written under a misapprehension of the real character of the contract. It is true that this system is incompatible with the proper *curing* of fresh; but no blame can properly be imputed to Captain Laughton on this account. The Governor General in Council is, therefore, glad to relieve that officer from any censure which may be supposed to attach to him with reference to the fishing contract.

From A. O. HUME, ESQ., C. B., Officiating Secretary to the Government of India, Home Department, to the Superintendent of Port Blair and the Nicobars,—No. 422, dated Fort William, the 21st January 1871.

I AM directed to acknowledge the receipt of your letter No. 1100, dated the 6th ultimo, on the subject of the publication of Dr. Day's criticisms on the management of the fisheries of Port Blair.

2. In reply, I am desired to state that the Governor General in Council regrets that by an oversight Dr. Day's report was published *in extenso*, before your replies to certain strictures therein contained had been received. On perusal of the explanations furnished by you, and other documents bearing on the question, His Excellency in Council, although unable to allow that the administration of Port Blair had utilized to the fullest extent the resources of the Settlement as regards fish, has come to the conclusion that the contract made by Captain Laughton was not so improvident as Dr. Day's report made it appear, and that the condemnation pronounced upon it in that report was based upon a misapprehension of the real character of the contract. His Excellency in Council therefore has, as you will have seen from paragraphs 11 to 13 of the Resolution of the 4th instant, relieved Captain Laughton and your administration from any censure that might be supposed to attach with reference to the fishing contract.

No. 29 of 1871.

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, AUGUST 5, 1871.

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GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

RAIN-FALL IN THE DISTRICTS OF THE NORTH-WESTERN PROVINCES.

From C. A. ELLIOTT, ESQ., Officiating Secretary to the Government, North-Western Provinces, to the Secretary to the Government of India in the Department of Agriculture, Revenue, and Commerce,—No. 1156A, dated Nynee Tal, the 20th July 1871.

IN reply to your letter No. 4, dated 27th June, I am directed to forward, for the information of His Excellency the Governor General in Council, an Abstract Statement of the average rain-fall in the Districts of the North-Western Provinces during the week ending 30th June 1871, and of the total fall from the 1st June 1871.

2. I am to add that so far the argricultural accounts from all parts of the Province are favorable.

Abstract Statement of average rain-fall in the Districts of the North-Western Provinces during the week ending the 30th June and total fall from 1st June 1871.

DISTRICTS.	Week ending 30th June 1871.	Total from 1st June 1871.	REMARKS.
Kumaon	5·0	14·0	
Gurhwal	3·3	11·4	
Dehra Doon	6·2	22·1	
Seharunpore	4·3	10·2	
Bijnour	3·5	11·3	
Moradabad	2·7	10·5	
Terai	5·5	14·7	
Bareilly	1·7	8·8	
Budaon	1·3	5·7	
Shahjehanpore	1·1	7·3	
Moozuffernuggur	2·5	4·8	
Meerut	1·9	6 2	
Boolundshuhur	1·5	4·1	
Allygurh	1·5	5·2	
Etah	1·5	7·0	
Furruckabad	1·9	5·1	
Muttra	2·6	6·2	
Agra	1·9	5·9	
Mynpoory	3·7	9·5	
Etawah	2·7	7·4	
Cawnpore	3·3	5·8	
Jaloun	1·9	7·6	
Jhansie	1·1	7·8	
Lullutpore	1·7	12·3	
Humeerpore	2·5	6·5	
Futtehpore	5·4	10·7	
Banda	3·5	9·9	
Allahabad	3·7	11·6	
Mirzapore	1·3	12·0	
Benares	2·4	10·4	
Jounpore	3·5	6·0	
Ghazeepore	2·6	7·0	
Azimgurh	3·4	5·4	
Goruckpore	6·9	9·6	
Bustee	2·0	5·2	

From C. A. ELLIOTT, ESQ., Officiating Secretary to the Government, North-Western Provinces, to the Secretary to the Government of India in the Department of Agriculture, Revenue, and Commerce,—No. 1178A., dated Nynee Tal, the 26th July 1871.

IN continuation of my letter No. 1156A., dated 20th July, I am directed to forward, for the information of His Excellency the Governor General in Council, an Abstract Statement of the average rain-fall in the Districts of the North-Western Provinces during the week ending 7th July 1871, and of the total fall from the 1st June 1871.

2. I am to add that so far the agricultural accounts from all parts of the Province are favorable.

Abstract Statement of average rain-fall in the Districts of the North-Western Provinces during the week ending the 7th July 1871, and total fall from 1st June 1871.

DISTRICTS.	Week ending 7th July.	Total from 1st June 1871.	REMARKS.
Kumaon	4·3	18·3	
Gurhwal	·5	11·5	
Dehra Doon	4·3	26·4	
Seharunpore	1·0	11·2	
Bijnour	2·4	13·7	
Moradabad	1·0	11·2	
Terai	5·5	20·2	
Bareilly	3·9	22·8	
Budaon	1·0	6·7	
Shahjehanpore	5·5	12·8	
Moozuffernuggur	·4	5·1	
Meerut	·4	6·6	
Boolundshuhur	1·4	4·8	
Allygurh	·4	5·4	
Etah	1·6	8·6	
Furruckabad	·4	5·2	
Muttra	·9	6·5	
Agra	·2	6·0	
Mynpoory	·9	9·7	
Etawah	·4	7·7	
Cawnpore	·6	6·1	
Jaloun	·7	7·8	
Jhansie	·2	7·9	
Lullutpore	·7	12·7	
Humeerpore	1·2	7·7	
Futtehpore	1·8	12·5	
Banda	1·7	11·7	
Allahabad	2·5	14·1	
Mirzapore	1·2	13·2	
Benares	·8	3·1	
Jounpore	2·1	7·3	
Ghazeepore	2·3	9·4	
Azimgurh	1·6	6·9	
Goruckpore	4·3	13·9	
Bustee	2·9	8·1	

PROSPECTS OF THE COTTON CROP IN THE CENTRAL PROVINCES AND THE BERARS.

From HARRY RIVETT-CARNAC, ESQ., C. S., Cotton Commissioner, to the Secretary to the Chamber of Commerce, Bombay,—No. 3448, dated Allahabad, the 19th July 1871.

As the season for selling and exporting cotton in the Central Provinces and the Berars has come to a close, and the season for cultivating the crop, with all its anxieties, is now upon us, I follow the usual practice, and forward, for the information of your Chamber, a report on the state of the weather during the last six weeks, together with the opinions of the officers in the Cotton Districts of Central India on the prospects of the growing crop.

Report on the trading season to follow.

2. The usual report on the leading points of the past trading season in the Central Provinces and the Berars will reach your Chamber in the course of the next fortnight. It has been delayed in order that full statistics of the cotton trade at the chief ports of British India during the first six months of the current year may be included in the report, which it is hoped may, by the system that it is now proposed to adopt, be more complete than usual, and thus prove of more than ordinary interest.

3. It will not, however, have escaped the notice of your Chamber, from the reports duly submitted by this Department, that at the end of the month of May last, when the season may be said to have closed, the total quantity of cotton exported from the railway stations of the Central Provinces and the Berars to Bombay amounted to about 235,000 bales of 400 lbs. each, and that thus the estimates framed by the officers of this Department and submitted to your Chamber have not turned out to be very incorrect.

Crop estimates borne out by the exports.

4. Before quoting from the reports of the Assistants on the state of the weather and the prospects of the crop, it will, I think, be convenient to try and indicate as clearly as possible the tracts to which these reports refer. The subject has, it is true, been fully explained from time to time in my several annual reports; but as copies of these reports may not always be at hand, an approximate statement of the area sown with cotton in each division, and the quantity usually available for export, will, it is hoped, help to convey a sufficiently correct idea of the probable effect of a favourable or unfavourable season in the circles treated of in the reports of the Assistants which will be hereafter quoted.

Tracts which chiefly contribute to the exports.

5. The following table gives the area sown with cotton in the Districts of the Central Provinces and the Berars during the past season, and as during the last few years, although a slight increase has generally been noticed, no very great variation has occurred in this acreage, these figures may be taken to represent with sufficient accuracy the area sown during the present year. The figures of the current season will not be received from the District authorities until later in the year. They will, however, be forwarded without delay to your Chamber as soon as received.

Statement of the area sown with cotton in the Central Provinces and the Berars.

Statement showing approximately the area under Cotton cultivation in the Central Provinces and the Berars, and the quantity of Cotton annually exported.

Divisions.	Districts.	Acres.	Quantity of Cotton annually exported (in bales of 400 lbs.)
CENTRAL PROVINCES.			
NAGPORE ...	Nagpore	96,287	These Districts send about 30,000 bales to Bombay from the markets of Hingunghât, Arvee, Wurdah, and Deolee. Much cotton is consumed locally.
	Bhundara	.....	
	Chandah	57,527	
	Wurdah	181,119	
	Balaghât	.....	
JUBBULPORE ...	Jubbulpore ...	33,994	Export about 15,000 bales. The trade used to be with Mirzapore, but is turning towards Bombay since the opening of the main line of the Great Indian Peninsula Railway. A considerable local consumption affects the exports.
	Saugor	28,730	
	Dumoh	18,900	
	Seonee	6,431	
	Mundlah	1,517	
NERBUDDA ...	Baitool	1,950	
	Chindwara	23,343	
	Hoshungabad ...	21,198	
	Nursingpore ...	53,378	
	Nimar	24,869	
CHUTTEESGURH ...	Raipore	77,250	These Districts send some 7,000 bales to the Orissa country.
	Sumbulpore ...	75,750	
	Belaspore	65,974	
	Upper Godavery ...	719	
Total, Central Provinces, Acres ...		768,936	
THE BERARS.			
EAST BERAR ...	Oomraotee	361,210	These Districts export all their cotton to Bombay. In round numbers the annual export amounts to about 80,000 bales, Oomraotee being the chief mart.
	Ellichpore	191,257	
	Woon	134,543	
WEST BERAR ...	Akola	446,498	Annual exports to Bombay about 140,000 bales. Khangaon and Akote being the chief markets.
	Booldana	291,762	
	Bassim	64,157	
Total, Central Provinces, Acres ...		768,781	
The Berars, Acres		1,489,427	
Total, Central Provinces and the Berars, Acres.		2,258,208	Total annual exports to Bombay from 250,000 to 275,000 bales; to other parts of India 10,000 bales.

ALLAHABAD;
Dated 19th July 1871.

HARRY RIVETT-CARNAC,
Cotton Commissioner.

6. The cotton-sowing season in the Districts of Central India, to which this report chiefly relates, commences, as your Chamber knows full well, immediately after the setting-in of the monsoon, or rainy season. According to Native calculation, the rainy season commences on the 1st day of the month of Mroog, which falls on the 5th of our month of June, and my reports submitted during former years will have shown you the correctness of this calculation, and that heavy rain generally sets in in the Wurdah and Poornah Valleys between the 5th and 15th of the month.

Sowing season in Central India.

THE WURDAH VALLEY.

7. The following extracts from the weekly reports of Mr. Noble, the Assistant to the Cotton Commissioner in the Wurdah Valley Circle, including the Districts of Nagpore, Wurdah (Hingunghât), and Chandah, *which as the statement will show contribute annually to the Bombay market about* 30,000 bales of the finest cotton grown in India, describe the state of the weather in that tract from the commencement of the monsoon up to date.

The Wurdah Valley.

Writing on the 13th June, Mr. Noble says: "The weather during the past week has been rainy; regular monsoon weather, but unaccompanied by any heavy bursts of rain and wind which generally usher in the monsoon, except on the last day of the week (10th), when above one inch of rain fell. The total rain-fall from the 6th to the 10th was 1·72 inches." He also adds: "The weather is still rainy and cloudy: on the 11th, 1·20 and on the 12th, 0·23 inches of rain fell. The rain has for the present stopped all work on the Nagpore Farm."

Mr. Noble's reports.

Again, in his report of the 21st June, he adds: "During the past week 5·41 inches of rain fell: this makes a total of 6·27 inches from the 5th instant. Field-work is suspended, and the seed will be sown at the first favourable opportunity.

"Sowing operations have not yet commenced in any part of the District, and there is not much chance of the sowings being commenced for some days."

8. I have mentioned in a former paragraph that the sowing of the cotton-seed commences as soon as possible after the first downpour of rain. But to admit of sowing operations being conducted, a break of fine weather is necessary. The continuous rain in the Nagpore country stopped progress at first, as the following extract from Mr. Noble's report of the 28th June will show:

Fine weather necessary for sowing operations.

"During the past week the ground has been too wet to allow sowing operations to commence. The last few days were comparatively fine, and sowing was commenced on the farm yesterday. The sowings have now, I think, been generally commenced through the District."

9. The latest reports from Mr. Noble are as folllows: Under date the 6th instant he says—"The cotton sowings are, I think, almost completed throughout the District, or at least will be so by the end of this week, and jowarree *(Holcus sorghum)* sowings have commenced in some parts in the lighter soils. The weather continued fine until last night (5th), when heavy rain again commenced, and the rain promises to continue, which, of course, will cause the sowings to be suspended until the weather has again cleared up."

And again, on the 12th instant, he writes: "On the 6th and 7th July nearly seven inches of rain fell. This heavy rain has again stopped the sowings, and although we have had no heavy fall of rain since, still the ground is almost too wet for carrying on the sowing operations, but an attempt will be made to sow again this afternoon.

"Most of the cotton sowings are, I think, undoubtedly over, and the young plants are looking well; the larger plants had four to five leaves, while in some fields the plants had barely made an appearance above ground. The different people questioned by me gave favourable replies when asked about the state of the cotton."

10. The remarks in these extracts, although referring directly to the state of the crop in the Nagpore District, describes with sufficient accuracy the state of the weather in the other Districts of the Division. The District reports show that much rain fell, the figures from 1st of April up to the end of June being as follow:

Weather in the Nagpore Division similar to that at Nagpore.

	Inches.
Nagpore	12·5
Bhundara	15·43
Chandah	8·51
Hingunghât	7·56

11. Of the Wurdah Valley crop the prospects cannot then be said to be at present very favourable. There has undoubtedly been quite enough rain for the present; but fine weather will do much to freshen up the crop, and, as a rule, as a choice of evils, it is perhaps better to have too much than too little rain. The report from Mr. Noble, which should reach me before this letter has passed through the Press, and which will be added as a postscript, will enable me to give further, and, I hope, more favourable, information on this subject.

Prospects not very favourable.

Other Divisions of the Central Provinces.

12. If the area statement of the area under cotton cultivation in the Central Provinces and the Berars attached to this report has answered the purpose for which it was intended, then it will be seen that, with the exception of Nagpore, none of the Divisions in the Central Provinces furnish any large supplies of cotton to the export market, and that, therefore, the state of the weather in the Divisions, other than that already noticed, will not have so very much interest for the cotton-merchant.

Not so important to the cotton-merchant as Nagpore.

Still, it may be convenient to notice that in the Districts of the Jubbulpore and Nerbudda Divisions, the rain-fall has been heavy. Up to the end of June the rain-fall at Jubbulpore had amounted to 12·68 inches.

From the Districts lower down the Nerbudda Valley, the reports indicate that the rain-fall has been unusually severe, and that fine weather was wanted. The figures of these Districts are given below;

	Inches.
Nursingpore	20·7
Hoshungabad	15·3

The latest reports show that the weather cleared up at the end of the month, the Deputy Commissioner of Nursingpore reporting—"The break has allowed the preparation of the land for sowing."

13. Nimar, adjacent to Berar, has been an exception, the rain-fall there amounting to but 3·05 inches, and the state of the weather there assimilating to that experienced in West Berar to be noticed later. The Deputy Commissioner reports—"Rain is wanted to complete sowings." These District reports only bring us down to the end of June, and more rain has since fallen.

The Chutteesgurh Country.

14. The rain-fall for these Districts up to the end of June last is shown as follows:

	Inches.
Raipore	12·77
Sumbulpore	7·79
Belaspore	10·31

In Raipore, the great grain-supplying country, the sowings are said to be completed; so also in Sumbulpore and Belaspore: the prospects of the crop being good. But very little cotton comes from here however.

Prospects favourable.

15. At Sironcha, on the Godavery, but 5·34 inches of rain had fallen up to the end of June, "the rain holding off in a very provoking manner," as the Deputy Commissioner reports.

16. In the following statement the rain-fall during the month of June of the present year and that during the preceding year for the same period is shown for some of the most important Districts:

Rain-fall during the month of June.

	1870. Inches.	1871. Inches.
Nagpore	9·49	12·5
Jubbulpore	14·16	12·68
Hoshungabad	7·10	15·02
Raipore	11·41	12·41

The Berars.

17. Turning to our most important cotton-field, the Districts of the Berars, lying in the fertile valley of the Poornah, it will be found that in the portions adjoining the Wurdah Valley (East Berar) the weather at first somewhat resembled that in the Nagpore Division of the Central Provinces, described in the extracts already quoted from the report of Mr. Noble.

18. Under date the 10th of June last, in the first weather report submitted for the season, Mr. Nago Rao Jeyakrishna, Assistant to the Cotton Commissioner in East Berar, thus reported:

East Berar.

"The weather has been cloudy and oppressive for the last few days, and some heavy showers of rain have fallen in some parts of the country, especially towards the Ellichpore Hills. The rain also fell very heavily here about an hour ago, and the fall amounted to 1·10 inches. The total rain-fall here since the setting-in of the monsoon amounts to 1·30 inches."

In a subsequent report under date 17th June, he adds: "The weather has been cool and damp, and slight rain has also fallen here and everywhere since the setting-in of the monsoon, but the total rain-fall, which amounts to only 1·84 inches here, is not sufficient to render the cotton land fit for sowing, as it has not saturated the soil deeper than about 3 or 4 inches." In his report of the 23rd June, Mr. Nago Rao continues: "Since the setting-in of the monsoon, the weather has been such as could be desired. The rain has been falling more or less every day, and in every part of the country. The fall at Oomraotee up to the 21st amounted to 3·42 inches."

Mr. Nago Rao's report.

19. Towards the commencement of the present month, however, some anxiety began to be felt on account of the rain holding off. Under date the 3rd July, Mr. Nago Rao wrote:

"The reports which I have just received from different parts of the country show that the cultivators have now been busily engaged in sowing cotton and toor, that some of the cotton and toor land has already been sown, and that the young plants of cotton are looking yellowish for want of rain, which is now required everywhere. The reports also mention that the rain which fell hitherto in this part of the country was not general. On the 8th instant, he reports; "I am extremely glad to report, however, that luckily the long-looked-for rain returned yesterday evening, and saved the threatened crop for the time being. It has not been heavy, but such as could be desired. The last report is dated the 14th, and runs as follows:

"Since the last six days the weather has been such as could be desired. We are at present getting sunshine during the day, and the rain falls generally towards the evening or at night. This is generally considered to be very good, as it enables the cultivators to carry on the various farming operations during the daytime. The total rain-fall here to date amounted to 3·38 inches since the 6th instant, and to 9·86 inches since the setting-in of the monsoon.

"The reports which I have now received from the various parts of the country show distinctly that the rain-fall till the 8th instant was not well and equally distributed throughout the country; that consequently, the young cotton-plants in some parts looked somewhat withered; that since the 9th instant the fall has been general; and that the prospects of the growing crop are now favourable."

20. The above extracts will show that the weather in East Berar has not been unfavourable for the young crops, for though the break of open weather which usually follows the first

burst of rain seems to have somewhat affected the young plants, there is no evidence of any serious injury having as yet been caused.

West Berar.

21. In West Berar (the Khangaon and Akote country), the rain-fall had been much more scanty, and I am sorry to have to state that the crops have undoubtedly suffered in some degree from want of moisture.

22. Mr. Dunlop, in his report of 7th June, says: "The monsoon broke last evening at about 9 o'clock. There have only been a few cents of rain, and at this time the weather is fine, but there can be no doubt that the monsoon has reached us, and we may expect heavy rain shortly."

Writing on the 21st idem, he says: "The weather during the week has been exceedingly mild, and only light showers of rain have fallen, making altogether a fall of 40 cents. In some instances the cultivators have commenced sowing, but they require more rain, and I doubt if many fields will be sown before we have heavier rain. The weather is unsettled-looking, but, to the surprise of many, the rain holds off, and the season will probably be a late one.

"Since the submission of my last report, I have visited the Cotton Farm. I am quite satisfied so far with the results of early sowing, and what is still more satisfactory, the cultivators in Allusna acknowledge the advantage we have gained, and there is more sowing going on in that village than in any other that I passed during the two days I spent in the District."

23. In his report of the 29th June, Mr. Dunlop remarks regarding the want of rain: "The weather," he says, "during the week has been dry, and we have had nothing more than a few light showers of rain, the quantity registered being only 0·44 inches, making the total for the season 3·0 inches."

24. Mr. Pillans, the Superintendent of the Sheagaon Farm, in his report of the 26th idem, says: "The weather of the past week has not been altogether favourable for cotton, being rather too dry: we had four very drying days, and if the dry weather had continued until to-day, I should have had to have irrigated the young cotton-plants. However, on Saturday morning, we had a very nice shower, and yesterday a nice gentle rain fell, which has set up the cotton-plants."

25. On the 5th instant, Mr. Dunlop further states: "I regret to say that the weather has been unfavourable for the agricultural interests. There has been an entire absence of rain, and the cotton which was sown is now being burnt up by the heat. I should think that in this part of the District about 40 per cent. of the crop has been sown and will suffer. The remainder has been held over until more rain falls.

"On the whole, prospects are not good, and the longer the rain holds off, the worse they will become. We have only had 3 inches of rain up to date."

26. Mr. Dunlop's last report, dated the 12th instant, is hardly more favourable. He says: "In my last report I informed you that we were suffering from a protracted drought, which was very hurtful to the young crops, and I now regret to say that during the past week the same state of affairs has continued, and further serious damage has occurred to the cultivators.

"In the early part of the week I visited Julgaum, and had an opportunity of seeing much of the country in that direction. I found the cultivators there sowing their cotton, with the intention that it should germinate after the next rain. The sowing of the Jurree crop which is cultivated in the Julgaum Talook, is generally ten or fifteen days later than the sowing in this part of the District, so that the cultivators entirely lost the benefit of the early rain, and have now reluctantly to wait for a change in the weather. The delay is universally lamented, and in some villages the people said that if the rain held off longer, they would give up the attempt to sow cotton his season. The rain-fall registered at Julgaum amounted to only 2·80 inches.

"During the week I have also visited Balapore. In that talook the bulk of the cotton-crop has been sown. The earliest sown is almost totally destroyed by the drought, but what was put in the ground later has not yet germinated, and may still make its appearance after the first rain. The cultivators look on the prospects as very gloomy, and I admit that I have never seen them less favourable.

"With regard to the probable area set aside for cotton cultivation, my impression, after having traversed a considerable portion of the District, is, that had the weather been favourable, there would have been no decrease; but that now a considerable number of the people think it useless to sow cotton at so late a period, and that consequently on this account the area may be somewhat diminished. The longer the rain holds off, the more will this feeling be established, and it seems almost premature to give even this approximate opinion on the subject.

"While such is the general state of the District, you will be prepared to hear that the Government Farm has suffered severely, and I regret to say that the last week of drought has done distressing havoc with our young cotton-crop, which in my last report I informed you was then giving way. Every day of this weather tells upon the farm, and as it is desirable to give you the latest information, I made a careful inspection of all the fields this morning in company with Mr. Pillans. Two fields of Bunnee and Jurree have been saved by irrigation. The plants in them are backward, but healthy enough and out of danger. In other fields there are places more moist than others where the plants are still surviving, and will, I hope, pull through; and taking all these into the calculation, I have estimated that on the whole we may at present have 10 acres of a standing crop, but of this about 3 acres will probably succumb unless the rain comes at once. The remainder, about 63 acres, has been almost totally destroyed. Some five or six per cent. of the plants may be seen in the fields, but these are poor and sickly-looking, and there are so few of them that we have resolved to plough up the field and entirely re-sow them. They are now being prepared as rapidly as possible, but it is useless to attempt re-sowing before there is a change in the weather."

27. The statements of the Officers of the Cotton Department are borne out by the reports received from the Deputy Commissioners of the several Districts in Berar. These reports which are brought down to the 30th of June are abstracted below:

EAST BERAR.—*Reports for fortnight ending 30th June.*

	Fall of Rain from 1st April.	During the fortnight.	Total from 1st April.	REMARKS.
Oomraotee ...	2·64	3·43	6·7	Sowing of the khurreef-crops has been nearly completed, and so also cotton.
Ellichpore ...	...	...	4·22	Cotton and toor are being sown; ground is being prepared for rubbee crops.
Woon (rainfall not given)	...	...	...	Throughout the Districts, cultivators are busily engaged in preparing ground and sowing khurreef-crops *viz.*, there being a deficiency of rain during the latter half of the fortnight, very little jowarree sowing has been progressed with.

WEST BERAR.

	Fall of rain during the fortnight.	Total from 1st April 1871.	REMARKS.
Akola	1·9	3·93	The cultivators have commenced sowing. Cotton-seed has not germinated: more rain necessary, only 3 inches having fallen during the month.
Basim	1·48	3·5	As rain is holding off, sowing operations have not yet been generally undertaken. Where commenced, they have been put a stop to. If rain in sufficiency does not fall within the next ten days, it will be a very serious matter.
Booldana	0·87	3·03	Sowing operations have commenced only in places where there has been sufficient rain; in others they have been retarded: rain is much wanted.

28. The reports for the fortnight ending the 14th instant are expected immediately, and if received before this letter passes the Press, will be added as a postscript.

29. The following statement shows the rain-fall in the chief cotton-growing tracts of the Berars up to the end of June 1871, as compared with the same period last season, and will show how scanty the fall has been this year:

Rail-fall this season as compared with last.

	1870, to 30th June.	1871, to 30th June.
Oomraotee	14·35	9·86
Bassim	5·54	3·35
Booldana	11·09	4·54
Akola, including—	6·5	3·93
Balapore	7·2	4·0
Akote	4·98	4·30
Julgaum	6·63 to 15th July.	3·59 to 15th July.
Sheagaum	8·62	3·00

THE NORTH-WEST PROVINCES.

30. Turning from Central India to the North-West Provinces, we find that the weather has, in some cases, been more favourable to the crops. Some damage, however, has been experienced at Allahabad from unusually heavy rains.

31. Mr. Simpson, Superintendent of Experiments at Boolundshuhur, says in his report of the 10th June: "The weather in the beginning of the week was dull, and several heavy showers of rain fell on the 5th and 6th. Since then the sky has been alternately clear and cloudy, with the wind blowing mostly from the east.

Boolundshuhur Farm.

"The rain-fall of the past week is 0·63 inches, making up to date a total of 2·28 inches since the 1st April."

He further reports on the 26th idem: "The weather in the beginning of the week was very cloudy, with westerly wind, but on the evening of the 21st it changed suddenly to the east, and almost immediately after it commenced to rain.

"The total area sown with cotton up to date is 81 acres 3 roods 35 poles. The young seedlings are now progressing very well: in some of the first-sown fields of Hingunghât and Bunnee, the plants are fully one foot high."

32. On the 8th July he again writes: "The weather in the beginning of the week was clear and hot, and a strong breeze from the west, which dried things up greatly, but on the evening of the 3rd the wind changed from west to east. Since then the sky has been much clouded, and the atmosphere heavily charged with moisture, which is very favourable for the young plants and crops in general." And again, on the 15th idem, he adds: "The weather in the beginning of the week was very dull, and several heavy showers of rain fell on the 9th and three following days: the wind was mostly from the east. In the end of the week the sky was clear with passing clouds, which was very favourable for the crops in general.

"The rain-fall of the past week was 3·85 inches, making from 1st April up to date a total of 8·9 inches."

33. In addition to the farm at Boolundshuhur, another for experiments with all classes of produce has recently been established at Allahabad, from whence weather and crop accounts are regularly received. The following extracts from the weekly reports of Mr. Phillips, the Superintendent, show the kind of weather that has been experienced.

34. In his report of the 10th instant, he says: "The weather during the week has been extremely favorable for the dovelopment of the young plants, which have made considerable progress since the heavy rain we had the week before."

The weather at Allahabad.

On the 17th instant, however, he writes: "The weather has been generally very wet, with but little sunshine to counteract the effects of the rain. Owing to the excessive wet, the young cotton-plants are suffering severely: the leaves of many are rotting off. The varieties that have withstood the rains best are the country kind and the Berar Jurree."

35. These are certainly not encouraging prospects, and the ill-effects of the excessive rain at Allahabad are but too apparent. During my visits to the farm I have examined the condition of the young cotton-plants, and find that in loose soils, or in spots where from the lie of the land the drainage is bad, a large percentage of the plants have died off—in the former case from being buried by the earth which readily washes with the rain, and in the second case from the excessive moisture. The tap-roots are first affected, the injury rapidly spreads, and the whole plant soon decays.

36. The rain here (at Allahabad) has been particularly heavy. We have been having much more rain than was wanted, and could well have spared a portion to the Berar country. The rain-fall at Allahabad is given below:

	Inches.
From 1st to 30th June	15·48
From 1st to 19th July*	16·77
Total ...	32·25

37. It must, then, I fear be admitted that the prospects in the most important cotton-growing tracts in the Central Provinces are not at present very favourable. But all former experience shows us that the cotton-plant in that part of India is particularly hardy, and often, after alarming accounts of the damage done by rain or drought, we have learnt that the reports have been somewhat exaggerated, and that the crop has pulled through without much distress. The cultivator, who is naturally anxious about his crop, is never a particularly sanguine creature, and often sketches the season's prospects in the gloomy colours of his own spirits. But the effect of the weather at the model farms may be taken as representing very fairly the effect of the monsoon throughout the circle in the centre of which the farm is situated. From the reports of the officers who superintend these farms, quoted above, it will be seen that, in the Wurdah Valley and round Oomraotee, there is at present no serious cause for anxiety. In the Akola District (the Khamgaon and Akote country) the crop has certainly suffered from the want of rain. I hope that some portion of the damage may yet be repaired if seasonable weather returns. Before this letter leaves the Press, I hope to obtain the latest advices by telegraph, and to include them in this report. At Allahabad, it will be seen, we have suffered from exactly the opposite cause that injuriously affected the Sheogaon Farm.

General conclusions.

38. You have doubtless received accounts from Khandesh. I was sorry to hear recently in a private letter that the weather there had resembled that experienced in the West Berar country.

39. The Assistants have now been instructed to proceed on tour through their Divisions to ascertain the effect that the weather has had on the crop, and the result of their inquiries will be duly communicated to your Chamber. I am on the eve of starting on a tour through the Central India Cotton Districts, and my next report to your Chamber will, I trust, contain a less unfavourable account of the prospects of the crop, founded on personal observation and inspection, and on inquiries made during my tour.

Further report to be submitted after the personal inspection.

POSTSCRIPT.—*Dated Allahabad, 21st July* 1871.—Since my letter has been in the Press, the following further information has been received from the Cotton-growing Districts:

Latest information received.

WEST BERAR.

2. Mr. Dunlop writes under date the 19th instant as follows:

"During the past week considerable improvement has taken place in the weather generally, and heavy rain must have fallen in some parts of the country. Every evening massive clouds rolled up from the south-west, and the days were dull, as if rain must fall. But this part of Berar is peculiarly unfortunate, and during the week Sheagaum has been favoured with only 64 cents of rain, which has had little effect on the soil in its present state.

"Khamgaon and the country in that neighbourhood has fared no better. From the 9th to the 13th of the present month 77 cents were registered, making the total this season 2·83 inches—one inch less than we have had here.

"From Ballapore, also, the accounts areunfavourable: the total rain-fall up to the 17th instant being only 4 inches; but since then some showers have fallen, of which I have not yet received an account.

"The Tehseeldar (Native Magistrate) of Akote writes that there is great need of more rain in his circle, but he does not state how much has fallen up to date.

* On the 15th July 7·85 inches of rain fell at Allahabad.

"The prospects of this season's cotton-crop are every day becoming worse. We have clearly had monsoonish weather during the week, and yet little or no rain, and now it is feared that another break of fine weather may set in before this District receives a sufficient supply. In such a case the effect would be disastrous in the extreme both to the cotton and jowarree crops. The cultivators are now hesitating what to do with their fields, and a little more unfavourable weather will give the turn to the scale, and a large number in this locality will abandon the attempt to cultivate cotton this season.

"On the night of the 13th instant about half an inch of rain fell at Allusna, and on the morning of the 14th, I had the re-sowing commenced. Unfortunately, we have had no rain since then, and the fresh seed will be imperilled if the rain holds off much longer, but it is clearly proper to go on sowing, for if delayed, it will become too late in the season. Up to last evening 26 acres of Jurree and 10 acres of Bunnee had been completely re-sown, and some land, where the plants have only partly died, re-sown by the hand. The hybrid seeds have also been put into the ground. The remaining land is now being sown as speedily as possible. Mr. Pillans is of opinion that about 16 acres of the first-sown cotton will be saved.

"It is impossible to foretell what the farm will turn out this season, but at present the prospects are very bad, and the current week will show whether the cotton-crop is to get a start or not."

3. Mr. Pillans, the Superintendent of Experiments at Sheogaon, writing on the 17th to Mr. Dunlop, reports as follows:

Report of the Superintendent of Experiments, Sheogaon.

"I have the honor to report on the state of the farm at this place for the past week.

"It was not until the night of the 13th that we had any rain, the weather in the forepart of the week being dry and killing the cotton-plants very fast. On the night of the 13th we had a nice shower of 54 cents, which put life into many of the cotton-plants that looked nearly dead. I think now, by the look of the early-sown Bunnee fields, that there may be about 16 acres of plants left altogether: all the rest will have to be re-sown. Two acres that I irrigated,—one of Bunnee and one of Jurree,—are looking very well now.

"Owing to the fall of rain on the night of the 13th I commenced with the second sowing. On the 14th I sowed 8 acres of Jurree and 3 of Toor, and on the 15th about 18 acres of Jurree was sown: in all about 26 or 27 acres of Jurree was sown for the second time. One acre of indigo and half an acre of maize was also sown on the 15th. The *bukhurs* (Native ploughs) were hard at work getting the fields ready all day on Saturday.

"Since Friday last we have had little or no rain; the weather has been very cloudy, and rain has threatened every day. To-day the sky is very cloudy, and there seems to be rain in the clouds, but cannot get down: the wind still prevails, and no doubt the rain is carried away by that.

"The Koonbees' (Native cultivators) cotton has suffered like our own. I went through some of their fields, and there I saw that lots of the plants were dead. Many of them say that they will sow their fields with jowarree, as it is too late for cotton now.

"Now that the rain has fallen, I shall be busy sowing up the cotton, jowarree, tobacco, &c. I hope that the rain will fall to help me—a thing it seems very doubtful about doing.

"Our total rain-fall up to date is 3·8."

The following information has been received by telegraph:

WURDAH VALLEY.

Mr. Noble telegraphs from Nagpore as follows:

News by telegraph of the crops.

"21st July, 7-15 A. M.—Heavy, continued rains at present. Cotton on farm sickly. From District, accounts as yet good."

EAST BERAR.

Mr. Nago Rao telegraphs, under date 20th July, noon:

"Rain has been falling heavily since last night, here and everywhere."

WEST BERAR.

Mr. Dunlop's telegram of the 20th July, 9-15 A. M., is as follows:

"A favourable change in the weather took place yesterday; one and-a-half inches of rain-fall. More rain expected, and prospects better than before."

N. W. PROVINCES.—BOOLUNDSHUHUR.

The Collector of Boolundshuhur telegraphed to me yesterday (20th July) as follows:

"Weather favourable; crops in excellent condition."

HARRY RIVETT-CARNAC,
Cotton Commissioner.

GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Tuesday, the 25th July 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding.*
His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.
The Hon'ble John Strachey.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major-General the Hon'ble H. W. Norman, C. B.
The Hon'ble F. R. Cockerell.
The Hon'ble R. E. Egerton.

DUTIABLE GOODS TRANSPORT BILL.

The Hon'ble SIR RICHARD TEMPLE moved for leave to introduce a Bill to regulate the transport by Railways of dutiable goods to places beyond the customs line. He said that one result of the rapid extension of Railways in India had been that large quantities of goods were carried across our frontiers and serious frauds practised in the evasion of the customs duties, not through any fault of the customs officials, but through the fault of consignors or consignees. When goods had to cross a customs line, they could be dealt with in two ways—there must either be a vexatious system of examination at the line itself, or there must be a system by which all despatchers of dutiable goods might be obliged to take out passes on despatching the goods, and by which despatchers of non-dutiable goods might be compelled to declare that they were so. There were of course cases, notably that of salt, in which the carriages conveying it might be easily examined on crossing the customs line; but it appeared, on the whole, that the best plan was to strike at the root of the evil, and provide that all goods should be protected with a pass. In order to give the Council an idea of the intention of the Act, he would ask leave to read the third and fourth sections.

"3. Any person wishing to forward dutiable goods or any package containing a dutiable article by any public conveyance to any place situate across a customs line, may apply to the Head of such customs line or to some officer duly authorized by him in that behalf for a pass.

"The said pass shall be in duplicate, in such form as the Local Government shall, from time to time, direct, and shall be granted by the Head of the said customs line or the officer so authorized as aforesaid, on payment of the duty which according to law would be payable at the customs line in respect of the goods or article for or in respect of which the pass is granted.

"4. Whenever any person not having the customs pass mentioned in section two tenders a package for transport by a public conveyance to a place across a customs line, the booking-officer shall, before booking such package for transport, require such person to sign a declaration that the package contains no dutiable article."

These two sections were the leading provisions of the Bill; all the rest had to deal with penalties and other subsidiary details. He hoped that, after hearing this explanation as to the scope of the Bill, the Council would grant him leave to introduce it.

The Motion was put and agreed to.

OATHS AND DECLARATIONS AMENDMENT BILL.

The Hon'ble MR. STEPHEN introduced the Bill to amend Act No. V of 1840 (concerning the Oaths and Declarations of Hindoos and Mahometans), and moved that it be referred to a Select Committee with instructions to report in six weeks. He said that the necessity for this Bill arose from the fact that the provisions which at present allowed of the substitution of declarations for oaths, extended only to witnesses, and did not embrace the case of jurors in criminal trials or Coroner's inquests, for whom it was desirable to provide. MR. STEPHEN had originally proposed to deal generally with this subject in the Evidence Bill, and several sections had been inserted in that Bill for this purpose. One of those provisions was that if the Court considered that a witness felt any particular form of oath especially binding, that particular form might be employed. The one object of oaths was to increase the likelihood of people telling the truth, and if one form of ceremony was more likely than another to secure this end, it was, MR. STEPHEN thought, only reasonable that this form should be adopted. The essential part of the present Bill was, however, the provision that, in all cases, a solemn declaration might be substituted for an oath. Moreover, the Act which it was proposed to amend, extended only to Hindús and Muhammadans. There was no possible reason for this restriction. Not to speak of Christians, there were so large a number of strange religions with which the Government and Courts of this country came in contact, that it was desirable to make the provision in the widest possible terms.

The Motion was put and agreed to.

CHAUKÍDÁRÍ ACT EXTENSION BILL.

The Hon'ble MR. STRACHEY presented the Report of the Select Committee on the Bill to authorise the extension of the Chaukídárí Act to places where there is no jamadár of Police.

LOCAL EXTENT ACTS BILL.

The Hon'ble MR. COCKERELL moved for leave to introduce a Bill for declaring the local extent of certain Acts of the Imperial Legislative Council. He said that the Bill related to (1*st*) Acts of a general character passed by the chief legislature since 1834, which were capable of being applied to the whole of British India, but contained in themselves no express definition of their local extent; and, (2*nd*), Acts which, though for the most part in general operation in the Non-Regulation, in common with the Regulation, Provinces, had never been legally extended to the former.

As the sole object of the Bill was to remove any doubt as to the intended local extent of Acts applicable to all the British territories in India, it would not include any Acts of more limited application, or whose local extent was already otherwise sufficiently defined.

The Bill was designed on the same principle as a Bill for declaring and consolidating the law relating to the local extent of certain Regulations and Acts, which had for some time past been before the Council, and was intended to form a connecting link between that measure and the Bills for declaring the law in force in the Panjáb and elsewhere, for the introduction of which leave was recently obtained.

The general nett result of these and other projected measures of a similar kind for declaring the law in force in the different Non-Regulation Provinces would be to simplify and render easy of accomplishment what had hitherto been an intricate, he might say almost impracticable, task, namely, the ascertainment of the entire operative law on any given subject within any particular portion of this vast empire.

As no alteration of the substance of the existing law was contemplated by this Bill, it would not be open to the objection that it was in any way calculated to limit the power now vested in the Local Councils of affecting, by their legislation, Acts passed by the chief legislature previous to the coming into operation of the Indian Councils' Act of 1861.

The Hon'ble MR. STEPHEN observed that the intention of the Bill was merely to supply an omission which occurred in many of the older Acts, namely, a distinct declaration of their local extent. The result of this omission was, that there was some doubt in the case of such Acts as to whether they were intended to apply to the whole of British India or not. This doubt it was now proposed to clear up, and the Bill was calculated to facilitate the administration of the law.

The Motion was put and agreed to.

PENSIONS' BILL.

The Hon'ble MR. COCKERELL also presented the Report of the Select Committee on the Bill to consolidate and amend the law relating to Pensions.

The following Select Committee was named:—

On the Bill to amend Act No. V of 1840 (concerning the Oaths and Declarations of Hindoos and Mahometans):—His Honour the Lieutenant-Governor of the Panjáb, the Hon'ble Messrs. Strachey, Cockerell and Egerton and the Mover.

The Council adjourned to Tuesday, the 1st August 1871.

H. S. CUNNINGHAM,
Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

SIMLA;
The 25th July 1871.

No. 30 of 1871.

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, AUGUST 12, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

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GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Tuesday, the 1st August 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding*.
His Honour the Lieutenant-Governor of the Panjáb.
His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.
The Hon'ble John Strachey.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major-General the Hon'ble H. W. Norman, C. B.
His Highness Sarámade Rájáháe Hindústán Ráj Rájendra Srí Mahárájádhiráj Sivái Rám Sing Bahádur, of Jaypúr, G. C. S. I.
The Hon'ble F. R. Cockerell.
The Hon'ble R. E. Egerton.

CHAUKÍDÁRÍ ACT EXTENSION BILL.

THE Hon'ble MR. STRACHEY moved that the Report of the Select Committee on the Bill to authorise the extension of the Chaukídárí Act to places where there is no Jamadár of Police be taken into consideration. He said

that when the Bill was first introduced the only object had been to remove certain restrictions with reference to the places where the Chaukídárí Act might be put in force, which had been found inconvenient in practice. The other Local Governments concurred with that of the North-Western Provinces in the desirability of removing these restrictions. When the Bill was ready to be passed, the Government of the North-Western Provinces had represented that there were other points as to which the Bill was susceptible of improvement, and that these might advantageously be dealt with in the present measure. Some correspondence with the North-Western Provinces Government on the subject had ensued, and the Government of India had expressed the opinion that, so far as the further amendments of the law suggested by the North-Western Provinces Government involved no question of principle, and even of a kind that no other Government could object to, there would probably be no reluctance on the part of this Council to enact them in the Bill; but that, as regarded matters of more importance, it would be necessary to consult the Governments concerned before legislation could proceed farther, and that to do this would necessarily cause considerable delay. The Government of the North-Western Provinces had replied that the necessity for the measure was urgent, and agreed that it would be desirable to leave the larger topics untouched for the present, in order that the Bill might be passed forthwith. Accordingly, the amendments now introduced were so simple that it was unnecessary to detain the Council by any further remarks with reference to them.

The Motion was put and agreed to.

The Hon'ble MR. COCKERELL moved that after section 4 the following section be added:—

"5. In Appendix A, at the end of the first paragraph, the words 'and the aggregate amount assessed shall not exceed the average rate of two annas per mensem for each house, shop or building in the District,' shall be omitted.

"In Appendix C, the words 'the first payment on the tenth day of the month next succeeding the date of this notification, and every subsequent payment on or before the tenth day of each succeeding month,' shall be omitted."

He said that the appendices contained the forms of process to be issued under the Act (XX of 1856), and the proposed omissions were necessary to bring about a correspondence between the forms and the alterations, to be effected by this Bill, in the provisions of that Act to which they had reference.

The Motion was put and agreed to.

The Hon'ble MR. COCKERELL also moved that the following words be added to section 5:—

"but shall not take effect within the territories subject to the Lieutenant-Governor of Bengal."

He remarked that as all the changes of the law contemplated by this Bill in effect merely gave greater latitude to the Executive and were simply of a permissive character, they would not, in fact, necessitate any variation of the existing procedure where such alteration was deemed inexpedient, and could hardly therefore, on general grounds, be open to objection on the part of the local authorities in any of the territories in which Act XX of 1856 was in operation. But as the last section of the proposed enactment provided for its incorporation with Act XX, the effect of applying this enactment to Bengal would, he (MR. COCKERELL) believed, be to restrict the power of the local Council to repeal or amend Act XX by its future legislation.

Now he (MR. COCKERELL) believed that, as a matter of fact, through the operation of two local Acts (III of 1864 and VI of 1868, B. C.), Act XX of 1856 had at the present time a very limited application in Bengal, and he

thought that it might very possibly be in contemplation in a future re-arrangement or consolidation of the Police law by the local Council, to repeal that Act entirely.

But even if no such consideration stood in the way of the extension of this Bill to Bengal, he would still hold that such extension was undesirable, inasmuch as the Bill related merely to matters of local detail, such as under a proper distribution of the legislative business of the country should be left to be dealt with exclusively by the local Legislature, wherever such a Legislature existed.

And that the present section 5 be read as section 6.

The Motion was put and agreed to.

The Hon'ble MR. COCKERELL then moved that the present section 5 be read as section 6.

The Motion was put and agreed to.

The Hon'ble MR. STRACHEY then moved that the Bill as amended be passed.

The Motion was put and agreed to.

LAND-REVENUE PROCEDURE (PANJÁB) BILL.

THE Hon'ble MR. STEPHEN moved for leave to introduce a Bill for consolidating and amending the law as to Land-Revenue Procedure in the Panjáb. He said that the present Bill formed a part of the scheme, which he had recently the honour of laying before the Council, for defining and consolidating the law of the Panjáb. He had had the advantage of consulting His Honour the Lieutenant-Governor and his hon'ble friend Mr. Egerton on the subject, and the opinion arrived at was that it would be more convenient to have two Bills: one to deal with the general law of the Province, and one to deal with land-revenue. The law as to this all-important subject had, from various causes, become extremely obscure and uncertain; and the wonder was, this obscurity and uncertainty had not entailed still more serious inconveniences than had been experienced. MR. STEPHEN might, however, refer to the discussions that took place in the Council some years ago, on the Panjáb Tenancy question, as an instance of the serious evils to which an indistinct, ambiguous and obscure law was calculated to give rise. A large portion of the difficulties in that long and troublesome controversy had arisen from the Settlement officials not clearly understanding the nature of the duties imposed on them by Regulation VII of 1822, and the other enactments which governed land-revenue procedure. There was hardly any subject of graver importance to the State, and there could be no doubt that it was desirable to free it, as far as possible, from all obscurity and confusion, and to give settlement officers the clearest and most unmistakable guide for their proceedings. There was no wish in any way to alter the law; all that was contemplated was to clear away doubts as to what was the law, and to put the existing law into a distinct and convenient form.

The Motion was put and agreed to.

CIVIL COURTS (OUDH) BILL.

THE Hon'ble MR. COCKERELL introduced the Bill to consolidate and amend the law relating to the Civil Courts in Oudh, and moved that it be referred to a Select Committee with instructions to report in six weeks. He said that this Bill was in the main a mere consolidation of the existing law with such alterations, either verbal or of arrangement, as were calculated to express the substance of that law in a more concise and intelligible form.

As regards the constitution of the Civil Courts and their original jurisdiction no change was proposed in the Bill as it now stood, but it might well be the case that, in the opinion of the local authorities, some amendment of the law in these respects, especially as that law was framed with no primary reference to the particular requirements of Oudh, was desirable. If such should be the general opinion, the projected legislation afforded a good opportunity for adopting any approved changes, and any proposals to that effect could be conveniently considered when the Bill was before a Select Committee.

So also in regard to the sections of the Bill relating to the appointment and removal of the presiding officers of the Courts, the oaths to be taken by them, the seals to be used, the places where the Courts were to be held, and the control of the appointment, and matters affecting the discipline, of the ministerial officers of the Courts. These provisions were taken from the Bengal Civil Courts' Act, and were for the most part identical with those of the former Bengal Regulations on the same subjects. As it had been the practice in Oudh to follow those Regulations in matters not expressly provided for by any law directly applied to that Province, the addition of provisions on such subjects, which were not treated of in the Central Provinces and Oudh Courts' Act of 1865, came obviously within the scope of a measure for the consolidation of the existing law.

The adaptation of these provisions to the circumstances of the Oudh Civil Courts in the manner contemplated by the Bill, was to a certain extent speculative, and they might very probably be found to need alteration in detail. They must be understood to be placed in the Bill tentatively, and to be subject to such modifications as might be advised by the local authorities.

The most important part of the Bill was that which dealt with the subject of the appellate jurisdiction of the Civil Courts.

The subject was one of some difficulty, owing to the absence of any settled principle in our previous legislation in reference to it.

In the Non-Regulation territories there were nearly as many differing forms of appellate procedure as there were divisions of such territories subject to a distinct local administration, and this, moreover, notwithstanding that the constitution and status of the Civil Courts up to, and inclusive of, the Court of the Commissioner, were almost precisely the same in each.

In British Burma, on whose Civil Courts the legislature first operated through Act I of 1863, a second appeal on the merits of a case was allowed from a decision on first appeal, when the judgment of the Lower Appellate Court differed from that of the Court of first instance, to the Commissioner, and his decision was absolutely final and not open to revision by any other Court on any question whatever.

In the Panjáb (Act VII of 1868) a second appeal under similar conditions lies to the Commissioner; but, as no finality was accorded to his decision thereon, a further special appeal against such decision might be brought under the Code of Civil Procedure.

In the Central Provinces, the Jhansi Division and Coorg, there was no second appeal on the merits of a case, but only the special appeal from an order passed in regular or first appeal on the terms of the Code of Civil Procedure.

In Oudh there was no absolute right of second appeal on the merits of any case, but the Appellate Courts exercise an extraordinary power of revision which practically operated as conferring the privilege of second, and even further appeal, to an almost unlimited extent.

This power originated in one of the provisos subject to which the Civil Procedure Code was extended to Oudh. That its supersession was intended by

the enactment of Act XIV of 1865, was evident from certain passages in the speech of Mr. Harington at the time of the passing of that Act. He said—

"With respect to the other suggestion, which proposed to continue a practice forming part of what was generally known as the patriarchal system, the Select Committee had observed as follows:—'We do not concur in the suggestion of the Judicial Commissioner that every Appellate Court should be empowered, within a year after any order shall have been passed by a Subordinate Court, to call up the case and revise the order. Where, as is the case in the present Bill, all proper facilities for appeal are allowed, we do not think it expedient to permit an Appellate Court to interfere except on appeal regularly preferred. In the absence of an appeal, it is only fair to presume that all parties are satisfied with the decision or are willing to submit to it, and it would be opposed to every principle of justice to allow any Court, of its own motion, to re-open the matter after an interval during which the decree has probably been executed and the whole litigation settled.'

"It was right he should mention that the Judicial Commissioner of Oudh, equally with the Judicial Commissioner of the Central Provinces, was anxious that the local Appellate Courts should retain the power which they now possessed of interfering with the decisions and orders of the Courts subordinate to them, although there should be no appeal, and although no objection should be taken by any one affected by the decision or order. The provision to this effect, which now formed part of the Code of Civil Procedure as in force in Oudh, was, he believed, introduced on the recommendation of Mr. Campbell, one of the learned Judges of the High Court at Calcutta, at the time he held the office of Judicial Commissioner of Oudh. Having lately had an opportunity of speaking to Mr. Campbell on the subject, he gathered from what fell from him, that he considered that the time had passed when the power in question could be exercised beneficially or for the interests of suitors, and that he was of opinion that the power should be withdrawn. In this opinion he (Mr. Harington) entirely concurred."

The proviso in question being a part of the then existing law should certainly have been repealed contemporaneously with the enactment of Act XIV of 1865. This was not done, and the result was that the power of revision had been considered to be in force and habitually exercised by the Appellate Courts in Oudh up to the present time.

Thus, in the six different territorial divisions of the Non-Regulation Provinces, there were no less than four distinct systems of appellate procedure based on entirely different principles.

The most commendable principle appeared to be that which gave a second appeal on the merits of a case from the conflicting decisions of the Courts of first instance and first appeal. The Bill consequently adopted the Panjáb procedure, but with this important modification, namely, that the second appeal should, in all cases, lie only to the highest Court of appeal in the Province.

If the right of second appeal on the facts was to be of any practical value, the appeal must lie to such a tribunal as would ensure the attainment of the best decision of the question in litigation as the circumstances of the Province would admit of. Even in the Regulation territories the main defect of our judicial system had always been held to be the weakness of the intermediate Courts of appeal; it being said that there was always a risk of the appeal from the decision of a well-instructed Court of first instance, which had had the advantage of hearing the evidence at first hand and marking the manner in which it was given, coming before a Court of at least no superior judicial capacity, and which had had no such advantage. If there were reasonable grounds for such an apprehension in regard to the intermediate Appellate Courts of the Regulation Provinces, where the Judges had no dual occupation, and, whatever may have been their antecedent deficiency of training for the bench, were set apart for exclusive employment in judicial business, they must exist in a greater degree in regard to the Court of the Commissioner in the Non-Regulation Provinces, whose attention was partially absorbed by his executive functions, and who might have been selected for the post which he filled with reference to his special aptitude for the discharge of such functions rather than for any particular judicial capacity.

For these reasons it was proposed that both the second appeal on the facts as well as the special appeal under the Civil Procedure Code should, in *all cases*, lie to the Judicial Commissioner, and that the latter be substituted for the abolished Financial Commissioner as the Court of final appeal in suits relating to land in Districts under settlement, the proviso under which the Appellate Courts obtained their extraordinary power of revision being expressly repealed.

A rather important consideration arose upon this proposition, namely, whether the Bill would not have the effect of throwing upon the Judicial Commissioner a greater amount of appellate business than he could reasonably be expected to dispose of compatibly with the due discharge of his other duties. The special appeals in suits relating to land being, under the policy of Government, exempted at present from liability to any Court fees, were already very numerous [indeed, he was informed that the present annual institution of appeals in Oudh averaged about two thousand, whilst the total number of such appeals which came yearly before the High Court of Calcutta, which had a working daily average of about three or four benches of Judges for their disposal, was scarcely above three thousand], and it was probable that the new procedure of the Bill would largely increase the present number.

This exemption from the payment of Court fees, and the excess in the number of appeals which it promoted, were doubtless but of temporary operation, and the period of such operation would soon expire as the settlements of land-revenue in Oudh were drawing to a close.

But, even if the excessive increase of business likely to devolve upon the highest Court of appeal through the operation of this Bill should not be of permanent duration, yet, on general grounds, it would seem expedient to devise some means of strengthening that Court partly by associating some other officer with the Judicial Commissioner for the trial of appeals, and partly by some provision for the reference of cases presenting questions of unusual difficulty to the High Court of the North-Western Provinces. In short, what appeared to be wanted was the restoration, in some form or other, of the substance of the procedure prescribed by the recently repealed Act XXXVII of 1867.

If this suggestion should commend itself to the local authorities, and he (MR. COCKERELL) had reason to believe that it accorded with the views of the present Chief Commissioner, there would be no difficulty in shaping the Bill so as to effect that object when it came before a Select Committee.

MR. COCKERELL had only to add that, in naming six weeks as the period within which this Bill, if committed, should be returnable to the Council, he had regard to the limited area within which the Bill was intended to operate, and the inconsiderable number of persons consequently to be consulted as to its provisions. But it should be clearly understood that there was no desire to hurry through the Council a measure involving such important considerations, and that the fullest opportunity would be afforded for eliciting the opinion of all persons most competent to advise on the subject of the proposed alterations of the law.

The Hon'ble MR. STEPHEN observed that the Council was at present in a particularly favorable position for legislating for Oudh, as it numbered among its Members two Ex-Commissioners of that Province. With reference to his hon'ble friend's remarks on the appellate system of India, the principle of such a system in his (Mr. STEPHEN's) opinion was, that the existence of a right of appeal exercised a constant influence in keeping judicial officers up to the mark. This check was weakened rather than strengthened by multiplying appeals. An officer, disposed to be negligent, would, no doubt, be quickened in the performance of his duties by the consciousness that his judgment would be reviewed by his immediate superior; but the effect of this was lessened by the reflection that this reviewing authority would, in its

turn, be reviewed by a Superior Court, and that the case might ultimately find its way to the Privy Council, and not be disposed of for years. So, again, as to special appeals: they were, no doubt, a natural arrangement at the time when the law had to be administered by officers comparatively uninstructed in its details; but as matters now stood, they were a premium to lawyers to pick every possible hole in a judgment, and there was great doubt whether, on the whole, they conduced to substantial justice; on the other hand, there was no doubt that they conduced largely to delay, chicanery and waste of time. It would, in Mr. STEPHEN's opinion, be far better to let the Courts state points of law, wherever a reasonable doubt existed, than to put it in the power of the parties to raise any question they pleased, and so indefinitely prolong litigation.

MR. STEPHEN made these remarks not with the least intention of throwing doubt on the propriety of his hon'ble friend's proposals, but merely for the purpose of reminding the Council that the present system of appeals in the Courts of this country was open to serious objection, and would some day or other require to be reformed. He did not, however, think that this was any reason for opposing the present measure or for putting Oudh on a different footing from other parts of the Empire.

The Motion was put and agreed to.

The following Select Committee was named :—

On the Bill to consolidate and amend the law relating to the Civil Courts in Oudh :—His Honour the Lieutenant-Governor of Panjáb, the Hon'ble Messrs. Strachey, Stephen and Egerton and the Mover.

The Council adjourned to Tuesday, the 8th August 1871.

H. S. CUNNINGHAM,

Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

SIMLA;
The 1st August 1871.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

IRRIGATION OPERATIONS OF *FUSL KHURREEF* IN THE PUNJAB UP TO 31st MAY 1871.

Canal Division.	Water distributed during May 1871. Depth in Canal at regulating guage. Full supply.	Actual throughout May.	Gross consumption, cubic feet per second. Estimated full supply.	Actual average throughout May.	Navigation Return Canal. Principal items of Traffic. Up.	Down.	Land irrigated (approximate). Zillah.	Acres.	Rain-fall. Average.	During month.	Chief crops (approximate). Name.	Area in acres.	Remarks.
									Inches.	Miles.			
B. D. Canal. 1st Division ...	4·9	3·22	.....	1,151·57	...	.....	Goordaspoor ...	4,156	0·85	0·20			174·23 cubic feet per second passed out at the various escapes. The supply maintained equalled the demand. The canal was partially closed from the 7th to the 9th for urgent repairs to rapid No. 10.
2nd „ M. B., Lower ...	4·6	2·33	.....	526·29	...	.....	Umritsur ...	4,495	0·62	1·14			
„ „ Lahore Branch ...	3·3	2·50	3,073·6	409·04	...	.....	Lahore ...	12,142	...	...	Cotton ...	9,473	
											Rice ...	618	
											Sugarcane...	5,118	
											Others ...	5,584	
Total Baree Doab Canal ...	.....	.....	3,073·6	2,086·90	*Nil.*	*Nil.*	.....	20,793	...	...	.....	20,793	The small increase in area irrigated does not require remark.
Corresponding period of *last* year	.....	.....	3,073·6	1,387·96	*Nil.*	*Nil.*	.....	16,698	...	...	.....	16,698	
Western Jumna Canal. Kurnaul Division ...	4·33	3·85	.....	171·30	...	123,530 logs, kurrees, bullies, &c.	Umballa ...	...	1·5	0·98			471 cubic feet per second passed down the Boodha Khera escape. Rain fell throughout the districts watered by the Western Jumna Canal, and the absence of the usual hot winds was specially noted.
Delhi „ ...	4·4	4·01	.....	750·32	...		Kurnaul ...	9,828	0·4	1·50			
Hansi „ ...	8·8	8·6	.....	929·61	...		Delhi ...	20,290	...	...			
„ Bulla Head ...	8·4	7·4	2,546·0	103·16	...		Rohtuck ...	22,307	...	...	Cotton ...	41,210	
							Hissar ...	11,294	...	...	Rice ...	313	
							Jheend ...	6,530	...	...	Sugarcane...	25,413	
							Bikaneer ...	139	...	...	Others ...	3,452	
Total Western Jumna Canal ...	.....	.....	2,546·0	1,954·39	...	123,530	.....	70,388	...	...	.....	70,388	
Corresponding period of last year	.....	.....	2,546·0	2,143·76	...	99,688	.....	70,958	...	...	.....	70,958	
Inundation Canals. Upper Sutlej Division ...	.....	.....	.....	.....	...	.....	Lahore ...	500	...	...	Detail not obtainable for want of Establishment.	.....	* The returns for *May* have *not* been received up to date from the Executive Engineer of the Lower Sutlej and Chenab *Division*.
Lower Sutlej and Chenab	.....	.....	.....	.....	...	.....	Montgomery ...	6,000	...	...		.....	
Indus Canals	.....	.....	.....	.....	...	.....	Mooltan ...	*	...	...		.....	
							Debra Ghazee Khan	32,754	...	...		.....	
Total Inundation Canals ...	.....	.....	.....	.....	...	.....	.....	39,254	...	...	.....	39,254	In the figures shown under grand total comparison with *last* year is made for Prennial Canals only, for want of the information necessary from the Inundation Canal Divisions.
Delhi and Goorgaon Works	.....	.....	.....	.....	...	.....	.....	.....	...	...	.....	.....	
Total Delhi and Goorgaon Works	.....	.....	.....	.....	...	.....	.....	.....	...	...	.....	.....	
Grand Total ...	.....	.....	.....	.....	...	.....	.....	91,181	...	...	.....	91,181	
Corresponding period last year ...	.....	.....	.....	.....	...	.....	.....	87,656	...	...	.....	87,656	

MUSSOORIE;
The 18th July 1871.

W. BROADFOOT, *Lieut., R. E.,*
Asst. Secy. to Govt., Punjab, P. W. D., Irrigation Branch.

IRRIGATION OPERATIONS OF LOWER BENGAL UP TO 31st MAY 1871.

Circle.	Canal.	Water supplied during. Full supply depth.	Estimated full discharge in cubic feet per second.	Average depth throughout the month.	Average discharge in cubic feet per second throughout the month.	Approximate area irrigated during. District.	Area actually receiving watercurrying over month, in acres.	Of column 8 area receiving water for first time during current year.	Total of columns 8 and 9 for all previous months of current year.	Total area irrigated up to date during the current year.	Rain-fall. Inches during the month.	Inches up to date during the year.	Average of ten previous years for the same period.	Navigation Return. Nature of Traffic.	Number of Boats.	Tonnage.	Ton mileage.	Approximate value of goods.	Chief Irrigation. Per column 8.	Per columns 8 & 9.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Orissa ..	High Level ..	..	No	information.		Cuttack ..	..	..	..	..	4·20	9·97	4·82	....	No	information.		..			
	Kendrapara ..	7	1,262	4·61	640·8	Ditto ..	..	..	..	..	4·20	9·97	4·82	Local ..	182	900	17,741	36,317			
														Through ..	410	3,216	14,313	134,019			
	Taldunda ..	8	1,300	7·25	125	Ditto ..	..	..	..	..	4·20	9·97	4·82	Local ..	20	* 866	1,008	145	..	..	The heavy rain-fall prevented any demand for artificial irrigation.
														Govt. ..	80	1, 0	19,866	1,421			
South-Western Circle.	Midnapoor ..	8	875	..	..	Midnapore ...	166	166	..	166	9·90	13·90	9·07	Govt. ..	14	172	10·26	299	Rice ploughing.	..	
	Panchcoora ..	6	240	..	..	Howrah ..	..	..	..	..	9·00	14·05	Not available.	Local ..	80	271	22·40	7,719	..	..	Range No. III. closed for repairs.
																					Range No. I. closed for repairs during the month.
	Tidal ..	..	..	..	..	....	..	..	..	..	..	..	..	Govt. ..	59	400	10,418	3,050	..	..	Navigation Canal.
														Local ..	887	7,588	197,288	128,206			
	IRRIGATION. *May* 1870.																				
Orissa ..	High Level ..	..	..	..	..	Cuttack ..	47	32	15	47	..	..	..	....	..	..	..	..	Cotton 15 Rice 32		
	Kendrapara ..	..	..	..	..	Ditto ..	2,151	1,220	981	2,151	..	..	..	....	..	..	..	..	Rice 32 Cotton 1,850	Cotton 1,069	
	Taldunda ..	..	..	..	..	Ditto ..	..	..	..	..	..	..	..	....	..	..	..	..	Rice 224	Rice 141	Canal closed from 10th
South-Western Circle.	Midnapoor ..	..	..	..	..	Midnapoor ..	25	..	35 ..	..	..	..	..	....	..	..	..	..	Rice 25	..	
	Panchcoora ..	..	..	..	..	Howrah ..	..	..	..	35	..	..	..	....	..	..	..	..	..	..	

The 6th July 1871.

T. M. KIRKWOOD, C. S.,
Canal Revenue Supdt., Bengal.

GOVERNMENT OF INDIA.

FINANCIAL DEPARTMENT.

DECIMAL SUB-DIVISION OF THE RUPEE.

Note by Lieutenant-General His Excellency the Hon'ble SIR W. R. MANSFIELD, K. C. B., K. C. S. I., *dated 7th March* 1870.

I TAKE the liberty of circulating some official papers on the Currency of Ceylon which were lately forwarded to me by His Excellency Sir Hercules Robinson, the Governor of that Island.

The second set of papers refers to a project for the decimalization of the subsidiary inferior coinage of the rupee, according to which the rupee being divided in 100 cents :—8 annas = 50 cents, 4 annas = 25, 2 annas = 12½, 1 anna = 6½, cents.

It is proposed that the two first should remain in circulation, *viz.*, the 8 anna and 4 anna piece, and that for the inferior sums, these should :—

Silver	...	...	1	...	... 10th rupee.
Copper	...	...	1	...	... 20th ,,
			1	...	... 50th ,,
			1	...	... 100th ,,
			1	...	... 200th ,,

For the argument and the scheme, I refer to Mr. Molesworth's paper which has been very carefully worked out.

With regard to the simplification of account-keeping and the petty calculations which occur daily in every shop and bazaar, and further to the expediency of having metallic coins which may take the place of cowries, &c., &c., it appears to me that the scheme is worthy the best consideration of the Financial Department.

The objection which meets us at once is that the anna is the basis of our stamp-duties. The difficulty does not appear to be insurmountable, if some "give and take" arrangement be adopted in the lowest priced stamps, such as that suggested for Ceylon.

No. 1133, dated Colombo, 2nd September 1869.

From the DIRECTOR OF PUBLIC WORKS, to the HON'BLE THE COLONIAL SECRETARY.

[DECIMAL COINAGE.]

SIR,—In compliance with the wishes of His Excellency the Governor, I have the honor to submit in a connected form the views which I discussed with him in the year 1866 respecting the introduction of a subsidiary decimal coinage of the Rupee.

The value of the decimal system is too well known and appreciated to render it necessary for me to enter minutely into its advantages; it may, however, be as well to combat an abstract and somewhat unpractical objection which is sometimes urged against it on the ground of the number 10 not being readily divisible without remainder by certain numbers—an objection not only to decimals but to the whole system of arithmetic now in use, and which, were it a forcible one, could only be met by entirely upsetting the present system, and adopting one based on the powers of 8 or 12; the former basis rendering it necessary to eliminate the figures 8 and 9 from our arithmetic, the latter rendering the creation of two additional figures necessary. Professor Airy (the Astronomer Royal) has,

however, after a careful consideration of this question, expressed his opinion that the adoption of a multiple capable of easy division practically gives no advantage, though at first sight it may appear to do so, and he strongly recommends the decimal system as the best; and Mr. Babbage, before he commenced the construction of his calculating machine, found it necessary to enter into an examination to ascertain whether it would be possible to simplify the mechanism, or accelerate its effects by the use of an arithmetic arranged on other powers than 10; but after a patient investigation of the various bases, particularly those of 8, 12, and 16, he arrived at the conclusion that a system of arithmetic having the number 10 as its basis was, on the whole, the best; and the efforts now made by nearly all civilized nations to introduce decimal coins, weights, and measures, afford the best proof of the value of the system.

Those, however, who have not been in the habit of using decimals can scarcely appreciate the advantages they afford when compared with annas and pie. The pie is the $\frac{1}{192}$nd part of a rupee, a very awkward fraction, and the following Table shows that the decimal equivalents of annas and pie are scarcely less cumbrous :

Table of the value of annas and pie in cents. or $\frac{1}{100}$ths of a Rupee from 1 *pie to* 15 *annas* 11 *pie.*

	P 0	P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8	P 9	P 10	P 11	
Annas.													Annas.
0	0	·521	1·041	1·562	2·083	2·604	3·125	3·646	4·166	4·687	5·208	5·729	0
1	6·25	6·771	7·292	7·813	8·333	8·854	9·374	9·895	10·416	10·937	11·458	11·979	1
2	12·5	13·02	13·541	14·062	14·583	15·104	15·625	16·146	16·666	17·187	17·707	18·228	2
3	18·75	19·27	19·791	20·312	20·832	21·353	21·874	22·395	22·916	23·437	23·958	24·479	3
4	25·	25·521	26·041	26·562	27·083	27·604	28·125	28·646	29·166	29·687	30·208	30·729	4
5	31·25	31·771	32·292	32·813	33·333	33·854	34·374	34·895	35·416	35·937	36·458	36·979	5
6	37·5	38·02	38·541	39·062	39·583	40·104	40·625	41·146	41·666	42·187	42·707	43·228	6
7	43·75	44·27	44·791	45·312	45·833	46·353	46·875	47·395	47·916	48·437	48·958	49·479	7
8	50·	50·521	51·041	51·562	52·083	52·604	53·125	53·646	54·166	54·687	55·208	55·729	8
9	56·25	56·771	57·292	57·813	58·333	58·854	59·374	59·895	60·416	60·937	61·458	61·979	9
10	62·5	63·02	63·541	64·062	64·583	65·104	65·525	66·146	66·666	67·187	67·707	68·228	10
11	68·75	69·27	69·791	70·312	70·832	71·353	71·874	72·395	72·916	73·437	73·958	74·479	11
12	75·	75·521	76·041	76·562	77·083	77·604	78·125	78·646	79·166	79·687	80·208	80·729	12
13	81·25	81·771	82·292	82·813	83·333	83·854	84·374	84·895	85·416	85·937	86·458	86·979	13
14	87·5	88·02	88·541	89·062	89·583	90·104	90·625	91·146	91·666	92·187	92·707	93·228	14
15	93·75	94·27	94·791	95·312	95·833	96·353	96·875	97·395	97·916	98·437	98·958	99·479	15
	0 P	1 P	2 P	3 P	4 P	5 P	6 P	7 P	8 P	9 P	10 P	11 P	

The following example will serve to illustrate the difference between the two systems :

EXAMPLE 1.

Required the cost of 7 *yards of cloth at* 7 *rupees* 6 *annas and* 5 *pie per yard.*

BY ANNAS AND PIE.			BY DECIMALS.
	6 annas		R. Cts.
7 Rs.	7		
7		5 pie	7·40
—	16)42(2 Rs.	7	
49 Rs. ...	32	12/35	7
...	—	—	—
2 10 0 ...	10 annas ...	2 11	51·80
2 11		—	—
51 12 11			

In this example 8 figures and simple multiplication alone are required by the *decimal* system, whilst 36 figures and division as well as multiplication are entailed by the system of *annas and pie.*

EXAMPLE 2.

Required the cost of 56 *superficial feet of Zinc, at* 18 *annas* 11 *pie per foot.*

BY ANNAS AND PIE.

11 Pie
13 annas 56
56 —
— 66
78 55
65 —
— 12/616
16)728(45 Rs. —
64 16)51 + 4 (3 Rs.
— 48
88 —
80 3 annas ... 3 3 4
— 45 8 0
8 annas 48 11 4

BY DECIMALS.

87 Cents.
56
—
522
435
—
48·72
—

In practically converting annas and pie, all the figures might not be set down in the manner of the foregoing examples, but the comparative amount of arithmetic is in each case fairly represented; such cases are of constant occurrence in all business transactions, and though ready reckoners are used to diminish the labour, it is far better to adopt a system requiring no such appliances.

The coins at present in use in Ceylon are as follows:

	Decimal of Rupee.	Value, assuming the Rupee = 24 pence.	Fraction of Rupee.
Rupee	1·	24*d.*	1
½ Rupee	·5	12	½
¼ „	·25	6	¼
4 penny piece	·166	4	1-6
2 anna piece	·125	3	1-8
One penny	·0416	1	1-24
Two Stiver piece	·0312	¾	1-32
Half-penny	·0208	½	1-48
One Stiver	·0156	⅜	1-64
Farthing	·0104	¼	1-96
Challie or pie	·0052	⅛	1-192

I would propose that the rupee, ½ rupee, and ¼ rupee should remain in circulation, and that the rupee should be divided into 100 parts, which I may term "cents" for convenience. The coinage for Ceylon would then stand as follows:

PROPOSED NEW CURRENCY.

		Fraction of Rupee.	Cents.	Equivalent value at 24 pence to a Rupee.
EXISTING COINS	Silver ...	Rupee ...	100	24
	„ ...	½ rupee ...	50	12
	„ ...	¼ „ ...	25	6
NEW COINS	Silver ...	1-10 rupee ..	10	2·4 or 2½*d.* nearly.
	Copper ...	1-20 rupee ..	5	1·2 or 1¼*d.* „
	„ ...	1-100 rupee	1	·24 or ¼ „
	„ ...	1-200 rupee	½	·12 or 1 challie nearly.

The foregoing table is calculated on the assumption that 24 pence equal the rupee, because the practice in this Colony renders it necessary to make the comparison between the proposed and the present coinage on this basis.

The lowest coin might be half a cent, and accounts might then be kept in two columns only, *viz.*, rupees and cents. Should it be considered necessary to carry out the decimal system to its full extent, this coin might be called a five mil piece; but it is scarcely desirable, for practically the five mil piece would never be used in accounts, and anything smaller than five mils or about half a farthing would be too small for coinage.

It may be desirable to convey an idea of the value of the $\frac{1}{100}$ part of a rupee to the Native mind more easily, by using the term siya (hundred) instead of cents, and the Singhalese character for this term could be impressed on the coins.

The two-anna piece might, or might not, remain in circulation as 12½ cents, but I think it would be more convenient to discourage its use, as the 10-cent piece would be a far more convenient coin, and some confusion would exist in the use of two coins so nearly of the same size and value. On the other hand, this might be obviated to some extent, by milling the edge of the 10-cent piece to distinguish it more readily, as the three-penny and four-penny pieces were distinguished in England.

The introduction of the new coinage would naturally be attended with considerable difficulties; it becomes, therefore, necessary to consider the character of such difficulties, and the best method of meeting them.

The principal of these difficulties are—

I.—The adjustment of stamps and tolls.

II.—The circulation of coins of the two systems at the same time, and the adjustment of small rates.

The first of these difficulties alone require serious consideration. The penny stamps being 4·166 cents, it is clear that the stamp by the altered coinage must be made either four or five cents in value. If it be made five cents, private individuals will have to pay 20 per cent. more for their penny stamps, whilst if it made four cents, there will be a loss to the revenue of about four per cent. on stamps of the value. This difficulty may, however, be easily overcome by an adjustment based on the present issue of stamps, which would give the advantage to the private individuals in some instances, and to the Government in others; the total result remaining nearly the same as at present, without inflicting an injustice on the individuals or entailing a loss in revenue.

The following adjustment, based on the stamp issues of 1868, will serve to illustrate my meaning. I would recommend that the penny postage stamps should be made four cents, the half-penny postage stamps two cents, whilst the present penny receipt or draft stamp should be made five cents.

A new stamp ordinance will be necessary to carry into effect this alteration.

The adjustment on the proposed rates only give a loss of £43 on the total value of stamps issued in 1868, which amounts to about £108,000.

Table showing the proposed adjustments of rates for stamps on the decimal system.

Character of Stamp.	Number issued in 1868.	Value at present rates.		Value at proposed rates.	
		Rate.	Amount.	Rate.	Amount.
		Pence.	Rupees.	Cents.	Rupees.
Postage ...	265,303	½	5,527	2	5,306
Ditto ...	1,224,938	1	51,039	4	48,997
Ditto ...	68,694	2	5,724	8	5,495
Ditto ...	56,963	3	7,120	12	6,835
Ditto ...	18,699	4	3,116	16	2,992
Ditto ...	32,017	5	6,670	20	6,403
Ditto ...	8,175	8	2,725	30	2,452
Ditto ...	10,880	9	4,080	35	3,808
Ditto ...	21,624	10	9,010	40	8,649
Ditto ...	103	21	90	85	87
Receipt, draft, or judicial ...	385,688	1	16,070	5	19,284
Ditto ...	58,368	2	4,864	10	5,837
Ditto ...	18,340	3	2,292	14	2,567
Ditto ...	27,156	4	4,526	18	4,888
Ditto ...	3,657	8	1,219	30	1,097
Ditto ...	39,958	9	14,984	35	13,985
Ditto ...	2,295*	3	287	14	321
Ditto ...	5,235*	4	872	18	942
Ditto ...	4,438*	8	1,479	30	1,331
Ditto ...	519*	9	194	35	181
Total ...	2,253,050	.....	141,888	.....	141,457

The stamps marked* represent those above the value of a shilling, such as 1*s.* 3*d.*, 3*s.* 4*d.*, &c., but the fractional portion alone has been dealt with, because the value of the shilling may remain unaltered as 50 cents, and needs no adjustment.

The total number of stamps issued during the year 1868 was 3,112,184, but this includes a large number of six penny, shilling, and other stamps of higher value, which, as they will remain unaltered in value, I have omitted in dealing with the question of adjustment.

The stock of stamps in hand, with the exception of those which would bear a higher value, might remain in circulation at their adjusted value even after the introduction of the decimal system, for instance, the ½*d.* and 1*d.* postage might pass current for two and four cents, respectively; and inconvenience to the existing holders of such stamps might be obviated by a proclamation, that, after a specified date, certain stamps would pass current for specified values in cents,—a period after that date being allowed to enable holders to return their stamps and receive an equivalent in other stamps. But to prevent fraud, no stamps of that class should be issued from the treasury during that period, or, if issued, that they should be so marked as to prevent their being exchanged for an equivalent to their nominal value.

It would be necessary that the 1*d.* draft, receipt, and other stamps, the value of which would be raised by the adjustment, should cease to be current; but a period should be allowed during which the holders of such stamps might be allowed to exchange them for other stamps equivalent to their original value.

The tolls would be but little affected by the new system, as all the more important toll rates might remain unchanged; but as a new ordinance to fix the rates would in any case be required, new rates on the "give and take" principle might be adopted.

The following rates might require alteration:

Nature of Toll Rates.	Present rates.		Proposed rates.
	In pence.	In cents.	In cents.
Loaded canoe	16	66⅔	70
Passenger vehicle, 2 wheels	15	62½	60
Cart drawn by one animal			
Unloaded canoe			
Unloaded elephant cart	9	37½	40
Loaded elephant			
Unloaded dhoney	8	33⅓	30
Unloaded cart	4½	18¾	20
Unloaded canoe	4	16⅔	16
Additional horse			
Loaded ox			
Additional bullock	3	12½	10
Unloaded one horse cart			
Additional canoe			
Leaguer or cask	2	8⅓	10
Additional ox to passenger cart			
Unloaded ox	1½	6¼	6
Additional animal to cart			
Foot passengers at ferries	½	2·08	2·00
Pigs, goats, &c.	¼	1·04	1

The difficulties inseparable from the transition to the new coinage would, I believe, in practice, be less than might be imagined at first sight. I speak from personal experience on this subject, having resided in Portugal for a short time immediately after the introduction of the decimal system of mil-reis coinage in that country; and though the transition was far more complicated than that which I propose (the Crusado and Testoon, with their subsidiary coins, being in full circulation), I was astonished to find how soon the people became accustomed to it, how little inconvenience was caused by the change, and how much the decimal system was appreciated.

The difficulties might, I think, be much mitigated by issuing beforehand a proclamation, that, after a specified date, the existing copper coinage would not be lawful money; and the calling in of the coin might be facilitated by the offer of a small premium on all sums in copper exceeding, say, Rupees 40 paid into the treasury, the cost of such premium might be recovered from the profits on the issue of the new copper coinage.

With contract, based on states of the existing coinage, I believe there would be no difficulty; such contracts will be few, and they would in all probability expire before the new system could be brought into operation; but, if not, the calculations might be made on the rates of the old coinage, and the gross accounts so calculated would not be affected to any appreciable extent.

The prices paid for different retailed articles would very soon adjust themselves without any special provision.

I have, &c.,

GUILFORD L. MOLESWORTH.

The Standard Commissioners' Report of 1841 contains the following statement: "The "first point, which has called for our special notice, is the general question of decimal "scale. In introducing this subject, we beg leave to invite the attention of the Govern- "ment to the advantage and facility of establishing in this country a decimal system "of coinage. In our opinion no single change, which it is in the power of a Government "to effect in our monetary system, would be felt by all classes as equally beneficial with "this, when the temporary inconveniences attending the change had passed away."

Commissioners appointed in 1843 stated that "they felt it their duty to represent "that they were strongly impressed with the advantages of a decimal system of coinage."

The Standard Commission, recommended in August 1869 "That the decimalization "of the (British) system of coinage, should be undertaken by Government."

Mr. S. S. Lloyd, Chairman of the Association of Chambers of Commerce, states in *evidence before the Royal Commission* on International Coinage, July 1868: "I think "the recognition of the advantages of the decimal system of accounts is growing very "much amongst the commercial community:" and before the same Commission, E. K. Mespratt, Esq., Member of the Council of the Liverpool Chamber of Commerce, in reply to the question, "does the quotation of the prices of cotton by eighths of a penny militate against the expression of a desire for a decimal division?" says: "Considering "that Liverpool has very prominently come forward in favor of decimalization, it would "not seem as if the decimalization created any difficulty in the way of the quotation of "the cotton—and considering that they have in America a decimal system as regards "their money, and that they got over the difficulty of expressing the eighth in a very simple "manner, I do not see that it is any real difficulty. I think it is only a fancied difficulty "put forward by men who are in favor of the duodecimal system. I do not think there "is any practical difficulty about it."

"Liverpool merchants have, I think, been more prominently than any others in "favour of the decimalization. I suppose, you know, that they altered the scale of corn "to the cental, the 100lbs., in order to facilitate transactions."

Proceeding of Meeting of the Association for the Introduction of the Decimal System into Ceylon, 1st December 1869.

MEMBERS PRESENT:

The Hon'ble the Queen's Advocate, Hon'ble T. B. Stephen, G. D. B. Harrison, Esq., M. L. C., H. W. Gillman, Esq., C. C. S., C. A. Lorenz, Esq., G. L. Molesworth, Esq., H. Dias, Esq., C. L. Ferdinands, Esq., Lieutenant C. Woodward.

The meeting then proceeded to the election of a Chairman and Secretary.

It was proposed by Mr. Molesworth, and seconded by Mr. Lorenz that Mr. Harrison be elected Chairman. *Carried unanimously.*

Proposed by the Hon'ble R. F. Morgan, Q. A., seconded by Mr. Dias that Lieutenant Woodward be elected Secretary. *Carried unanimously.*

The following gentlemen were added to the list of Members:

A. Wise, M. L. C., D. Wilson, M. L. C., A. M. Ferguson, T. Steele, and J. A. Martensz.

The following members proposed by Mr. Lorenz were elected:

James Van Langenbery, Kandy, J. H. Tennekoon, Kurunegala, Solomon, John Pulle, Jaffna Edremanisinger, Durasamy, Colombo, E. H. Dehigama, M. L. C.

The Chairman then called on the Secretary to read the report.

Proposed by the Hon'ble T. B. Stephen.
Seconded by Mr. Lorenz.

That this report be adopted. *Carried unanimously.*

Proposed by Mr. Dias.

Seconded by Mr. Gillman.

That a deputation should wait on His Excellency the Governor to present a copy of this report, and such of the petitions as shall have been received up to date with an abstract of the signatures.

The Secretary was directed to communicate with the Private Secretary to learn from His Excellency what day next week would be convenient for him to receive the deputation after Wednesday.

The meeting was adjourned till this day week at 3-30 P. M.

C. WOODWARD, *Lt., R. E.*

First Report of the Association for the Introduction of a Decimal System into Ceylon.

THE Association sees much reason for congratulation in the present aspect of the decimal question in Ceylon.

The past efforts of the Association have met with the most unequivocal success. The paper drawn up and published by the Association for the purpose of explaining to the masses the proposed decimal currency and its advantages, has been widely circulated, and has produced a strong and universal feeling throughout the country in favor of the decimal sub-division of the rupee.

The planting community, already prepared for decimals by their use in working out estate expenditure,* at once appreciated its advantages and signed the memorials very numerously.

The Native traders whose natural aptitude for computation has enabled them readily to grasp and appreciate the explanation given by the Association, have come forward most readily in support of the decimal currency.

Numerous petitions are daily pouring in from all parts of Ceylon, and the signatures attached to them show that the feeling in favor of the decimal system is shared by all classes alike.

In Jaffna, where Indian proclivities and proximity to India might be supposed to prejudice them in favor of the anna and pie, the inhabitants have come forward even more readily then elsewhere in support of the movement for decimals.

The missionaries and others engaged in education, seeing the advantages such a system must give them in their labors, are also active supporters of the movement.

The public journals are now unanimous in the advocacy of the decimal system, and a few extracts from the different journals are annexed to this report.

The Association has further cause for congratulation in the accession to their strength of several members of the Executive and Legislative Councils and other gentlemen of high position and standing in Ceylon.

The Association has carefully avoided entering upon the question of whether any change from the present system is necessary. Amongst their members are some who hold that no change is required—others consider that a change is desirable—but all are unanimous in favor of a decimal currency, should the present system be abolished.

APPENDIX No. 1.

Memorial to His Excellency SIR HERCULES ROBINSON, K. C. M. G., *Governor and Commander-in-Chief of the Island of Ceylon and its Dependencies, &c., &c. &c.*

MAY IT PLEASE YOUR EXCELLENCY,—We the undersigned having heard that the present currency of £ s. d. is to be abolished, and that rupees substituted for it, most earnestly request that if such a change be necessary, the subsidiary divisions may be decimals of the rupee, and *not annas and pie.*

We have every reason to believe that the term "decimal" is not generally understood in Ceylon, and that many erroneously fancy a decimal coinage must involve some great and difficult change, and that it will be necessary for those who do not understand decimal arithmetic to learn it before they can comprehend and use a deimal coinage.

This fear is entirely without foundation. The change is very slight and simple; it is unnecessary to acquire a knowledge of decimal arithmetic to use it, and a child might be made to understand it in a few minutes.

We are convinced that if this were rightly understood, the inhabitants of Ceylon would be unanimous in their demand for it.

The decimal coinage, as we understand it, simply consists in dividing the rupee into 100 (instead of 96 farthings as at present) and calling these "cents" or any other convenient denomination.

It will be unnecessary to put a single coin out of circulation; all the silver coins will circulate at their present value, and the *copper coins only* at a very slightly altered value.

The rupee will consist of 10 cents or "siyas" (the Singhalese name for 100ths.)

The shilling consists of	50	cents.		These will circulate unaltered in value.
„ six-pence	„	25	„	
„ Three-peuce	„	12½	„	
„ Penny	„	4	„	These may circulate altered in value only to the almost unappreciable extent of 4 per cent.
„ Half-penny	„	2	„	
„ Farthing	„	1	„	
„ Challie	„	½	„	

We do not think that it will be *absolutely necessary* to create any new coins; but to prevent any possible injustice or objection, two (or possibly three) new copper pieces might be coined, and made exchangeable at all the Government cutcheries for an equivalent value (*viz.*, at the rate of 25 cents for 24 farthings).

Thus, it will be seen that the change is trifling, and the only difficulty would be a slight effort of memory to remember that the farthing equals one cent, the penny 4, and the shilling 50, &c., which might be mastered by any one in a few minutes.

The adoption of decimals will be followed by advantages too numerous to be mentioned. For example it will effect—

1*st.*—An immense saving of labor, trouble, and risk of error in all accounts.

2*nd.*—Persons possessing a limited knowledge of arithmetic will far more easily make a *practical* use of that knowledge.

* See Mr. George Wall's paper on estate expenditure, July 1866, in which the calculations are made out in decimals.

3*rd*.—The education of the lower classes will be much assisted thereby.*

4*th*.—Simple multiplication and division will take the place of the intricate compound multiplication and division required by annas and pie.

5*th*.—It will help persons unacquainted with arithmetic, in that mental computation (so common amongst small dealers in Ceylon) which is made without figures but by the aid of the fingers, and by dividing articles to be sold in small heaps of 10.

6*th*.—It will fall in with, and materially aid, the practice of selling by the hundred, so universally used in small transactions such as the sale of plantains, nuts, fish, and other articles innumerable.

Two examples will show the immense advantages of the decimal system in division and multiplication.

Ex. I.—*Multiply* 14 *annas* 7 *Pie* (=†91 *cents*) *by* 365.

By Annas and Pie.				By Decimals.
14 Annas	7 Pie.			Cents.
365	365			91
				365
70	12)2555			
84				4·55
42	16)212	„ 11 pie (13) Rs.		54·6
	16			273
16)5110 (319 Rs.				
84	52			Rs. 332·15 Cts.
	48			
31				
16	4 Annas.			
	Rs.	Annas.	Pie.	
150	319	6	0	
144	13	4	11	
6 Ans.	332	10	11	

Ex. II.—*Divide* 759 *Rupees by* 425.

By Annas. and Pie.	By Decimals.
425) 759 (1 Re.	Rs. Cents.
425	425) 759 (1·78
	425
334	
16	3340
	2975
2004	
334	3650
	3400
425) 5344 (12 annas.	
425	250
1094	
850	
244	
12	
425) 2928 (6 pie.	
2550	
378	

* Professor de Morgan states that 1-20th of the time spent in primary education, and 1-4th of the time spent in learning arithmetic, is thrown away by the non-adoption of a decimal system.

† 91 cents does not exactly equal 14 annas and 7 pie, but the nearest decimal division has been taken as an example to show the difference of the two systems.

All civilized nations are endeavouring to adopt a decimal system, but none, we believe, possess such facilities as those afforded by the present state of the currency of Ceylon; while no opportunity can occur for its introduction more favourable than the present.

We beg therefore that your Excellency may be pleased to grant it in preference to the objectionable and inconvenient system of annas and pie.

Appendix II.

Extract from a translation of an article which appeared in the "Lakrivikirana" of 5th November 1869.*

According to the suggested change there will be 96 farthings in a rupee.

The petitioners request that it (the rupee) may be divided into 100 parts, and that cent, or "siya," or any other appropriate name may be given to them. Then

In	1	shilling there will be	50	cents or siya.	
	6*d*	„	„	25	„ „
	3*d*	„	„	12½	„ „
	1	„	„	4	„ „
	¼	„	„	1	„ „
	⅛	„	„	½	„ „

That 4 cents, 1 cent, and ½ cent, require no new coins, because the difference is very trifling.

When it is kept in mind that one penny is equal to 4 cents or siyas, farthing is equal to one cent, 1 copper challie equal to ½ cent, even a child would be able to understand this (method).

The advantages attainable by this are numerous. The following are some of them:

1. Difficulties and errors in accounts will be avoided.

2. It would be easy for persons dealing in small articles of sale who are only up to finger counting and do not understand arithmetic, to effect their sales by dividing their goods by portions of tens.

3. It will be very convenient and agreeable for the sales carried on by hundreds, *viz*.—

If 100 cocoanuts are sold for Rs. 4, one cocoanut's value is 4 cents, 10 cocoanuts 40 cents; similarly, if 100 plantains are sold for Re. 1, 8 plaintains' value is 8 cents, 15 plaintains, 15 cents, &c.

In most of the countries in Europe such a method as this is adopted.

In consequence of the conveniences attained by this system of accounts they are trying to introduce such a system in other civilized countries also.

("*Ceylon Observer*," *November* 13, 1869.)

We are now very hopeful that with the beginning of 1870 Ceylon will rank amongst the countries using a decimal currency, to be

* The *Lakrivikirana* is a Native Journal printed in the Vernacular.

followed at no distant date by the same principle applied to weights and measures. A well-known planting correspondent writes: "I fancy no one now anticipates the possibility of the old denomination of currency being retained. There is a very *general strong* feeling in favor of a *decimal* currency. Almost every one with whom I have discussed the subject, whether favorable or not to a change, prefers the decimal system to the Indian of annas and pie or pice. Memorials now going round for signature will prove by the multitude of names attached how universal this feeling is. West Matale seems united like one man, in favour of a decimal currency. Still it is a curious practical commentary on all this arguing and discussion, the fact that the other day I got a sovereign at the bank for ten rupees! However, you and I both remember the time when we would have had to pay eleven and a half rupees."

("*Ceylon Times*," 16*th November* 1869.)

As regards the currency, general opinion is decidedly in favour of a decimal monetary system as compared with the cumbrous rupees, annas, and pies of India, and memorials to this effect have been freely circulated and as freely signed.

If, therefore, the Secretary of State should not yield to the representation made in favour of retaining the existing system of £ *s. d.*, and there should be any real disposition on the part of Government to sanction such a change as the adoption of decimal coinage, the present expression of popular feeling backed up by an unanimous press will enable the Governor to carry it out.

("*Examiner*," 20*th November* 1869.)

As regards the third scheme, of decimalizing the rupee, we have already spoken out our mind, not only in favor of the rupee and its sub-divisions into cents, generally on its own merits, but even as preferable to the old and cumbrous system of pounds, shillings, and pence. For taking the original objectors on their own ground, *viz*., that ten rupees should still be considered a "pound," the proposed decimal system meets their views entirely, except as to the substitution of 100 cents for 24 pence. For, if it really be the case that our leading merchants are so enamoured of the ten-rupee pound, or even so used to it, as to render an alteration undesirable or inconvenient, the adoption of the decimal system will obviate all inconvenience; for a stroke of the pen or a mere point will convert any number of rupees into pounds—to wit, pounds equalizaing ten rupees each, so that 27,235 cents will not only represent 272·35, namely, Rs. 272 and 35 cents, but also (to please the 10-rupee partly) 27-2-35, namely, 72 pounds two rupees and 35 cents.

("*Kanady Herald*," 25*th November* 1869.)

The *Examiner* on Saturday last had another sensible article on the "Everlasting Rupee" in which, arguing in favor of the decimal system, it points out how easily the two opposing parties may be reconciled without sacrificing anything; if only cents be adopted, for instance, it shows that a total of 27,235 may by two touches of the pen be converted into pounds, rupees, and cents, thus, 27-2-35 (being 27 pounds, 2 rupees, and 35 cents).

("*Observer*," 29*th November* 1869.)

The change in the currency is not to be proclaimed until 1st July 1870. We trust that by this time public opinion will have so unequivocally declared itself that the Governor may feel justified in giving us a simple decimal system in connection with the rupee. We notice that Government is about to return a considerable quantity of bronze coins to Britain.

Note by Colonel Richard Strachey, R. E., C. S. I., *dated* 28*th March* 1871.

The first point to consider is whether the Rupee is likely to remain the unit of Indian money account, or whether, within any period to which we can look forward, it is probable that it may be displaced by anything else.

I conclude that it will continue to be the unit, and for the following reasons.

I regard the expediency of having an international *coinage*, as something quite distinct from that of having a universal system of *money account*. The first I believe to be easily attainable, as regards Europe and America, by the modification of the existing *coins*, so as to render them all referrible to a 5-franc coin. But this by no means implies that the national systems of *account* should necessarily be changed, and I don't think that this will be done so as to lead to a uniform system for a long time to come. For our present purposes, in fact, I should regard the period as so remote as not to affect the question now at issue.

* The officer who is to arrange the information will, I believe, have occasion to visit many of the districts as the shortest way of clearing up matters which he does not understand thoroughly, and it will probably be thought advisable that he should do so even while the enquiries are in progress.

I thus arrive at the conclusion that we may regard the pound as likely to remain the account unit of England. From this I further argue that so long as this is the case, any modification of the Indian coinage and system of account, to bring it into better accord with the systems of Europe, must aim at conformity with the pound system of England, and not the franc system of the Continent of Europe.

And this seems to me to follow, because 10 Rupees are approximately equal to 1 pound, and because a conversion on this basis has become habitual, and is convenient, bringing the Indian system into a decimal relation with that of England. It would not be possible, without a great disturbance, to adopt the franc unit in India, and, further, it is generally admitted that the franc unit of *account* is too small.

I conclude, therefore, as before stated, that we may consider the Rupee unit of account as likely to be retained in India, and that any change is likely to be in the direction of making a Rupee a tenth of a pound. How all this may be brought about is a question not directly bearing on the present point; but, whether it ever happens or not, I consider that we shall be safe in working up to a Rupee unit of *account* in any decimalization of the subdivisions of the Indian coinage.

The first thing that is apparent on looking into this subject is that a Rupee being divided now into 16 annas, each of which is divided into 12 pies, the total number of pies in a Rupee is 192. This number is so little different from 200, that there would be no appreciable difference, for purposes or retail trade, between 1 pie and one two-hundredth part of a Rupee. Here a possible basis for a decimal subdivision at once appears.

But a little consideration is necessary before determining what shall be the exact system of sub-division adopted. My conclusion is that we should simply divide the Rupee into 100 parts for purposes of *account*, calling them cents; 1 cent would thus be equal very nearly to 2 pies of the present scale. Hence 1 pie, if such a coin were retained, would be half a cent, and would be written ·005 Rupee. Any smaller fraction than ·005 Rupee could not be represented by coin, if the pie were the lowest in the scale, and such smaller fractions would be disregarded as fractions of pie now are.

To suit the coinage to this arrangement, we should have the existing 8-anna piece equal to 50 cents, the 4-anna piece equal to 25 cents, the 2-anna piece equal to $12\frac{1}{2}$ cents. These two last pieces are not proper members of a decimal coinage, but it would be expedient to continue them for some time, until the new decimal coins were familiar. The new silver coins eventually to be substituted for the 4-anna and 2-anna pieces would be a 20-cent and a 10-cent coin. The last would be easily practicable. The franc silver coinage of Europe has a 20-centime piece, which is only a little more than 8 cents of the Indian scale.

For amounts below 10 cents the coins would be of copper. The largest copper coin now struck is the half-anna, or double pice, equal to about 3 cents of the new scale. I should think a 5-cent coin should be given, supplemented by 2 cents, 1 cent, and $\frac{1}{2}$ cent, the last of which would be the equivalent of the pie and the lowest in the scale.

But as a provisional arrangement, I think it would be well, instead of the 2-cent piece, to coin a $1\frac{1}{2}$ cent piece, which would practically be equal to the $\frac{1}{4}$ anna or common pice; the difference between the existing $\frac{1}{4}$ anna coin and a $1\frac{1}{2}$ cent would only be $\frac{1}{8}$th of a pie, and may be better stated perhaps by saying that 64 of the old coins go to the Rupee instead of $66\frac{2}{3}$ of the new ones.

I also think that if such a system as this is adopted, occasion might be taken to give a more independent position to the 8-anna piece, and to assign to it a specific name, and endeavour to bring it into use as a unit for *payments*. It has long been said by those who have considered the subject, that the interests of all classes of society in India suffer by the inconveniently large value of the coin on which all transactions are based, and in terms of which all payments are made. No doubt, to make a change in this respect will not be very easy; but this, as I have said on other occasions, is all the more reason for setting about the thing at once.

The remedy would be a very simple and very innocent one, and I cannot conceive how the most tender conscience could be alarmed by it. All that is necessary is to give a *new* and *special name* to the 8-anna piece, or half rupee. I would suggest as a suitable name the term '*Hind*,' which is a fair equivalent of '*Franc*.'

The enquiry that has been suggested as to the probability of being able to get a decimalized system of minor coins adopted in India without difficulty, though it might lead to the accumulation of some interesting facts of which we now know nothing or little, seems to me of no sort of practical utility in relation to the essential point at issue. It is altogether impossible to adopt any conclusions at all on such a subject, excepting on somewhat abstract grounds, and all experience proves that whatever coins are issued are in point of fact brought into use. The state of the Indian copper coinage does not, to my mind, in the least militate against the general assertion I thus have made. Where the British pice are properly treated and can be got, they are used with complete readiness, and so it will be with all coins.

What we have to do is to see that the coins we issue will really be convenient, and this can only be ascertained by appealing to reason guided by experience, and not by interrogating ignorance and its consequences.

It is always reasonable to consider how ignorant people can be best got to leave off habits the result of ignorance; but beyond this I, for one, will never be concerned in suggesting the adoption of anything which I know to be bad, only because it is in harmony with something else which I also know to be bad.

To summarize the specific proposals I should desire to make:—

I.—The Rupee, for purposes of account, should henceforth be divided into 100 parts to be called cents. The lowest fraction of a Rupee to be recognised in payments to be half a cent, or the two-hundredth part of a Rupee.

II.—The silver subsidiary coinage to consist of pieces of 50 cents, 20 cents, and 10 cents only.

III.—As a provisional arrangement, and until the new coins are familiar, 4-anna pieces of 25 cents and 2-anna pieces of $12\frac{1}{2}$ cents may still be struck. But they should before long be withdrawn.

IV.—The 50 cent coin should hereafter be called the '*Hind*,' and that name should be stamped upon it. This coin should be a legal tender on the same footing as the existing half-rupee.

V.—The copper subsidiary coinage should in future consist of pieces of 5 cents, 2 cents, 1 cent, and $\frac{1}{2}$ a cent.

VI.—On the 5-cent piece, in addition to the inscription, '5 cents,' should be added '10 to 1 hind.'

VII.—As a provisional arrangement, instead of the 2-cent pieces, coins of $1\frac{1}{2}$ cent should be struck, which would virtually be equivalent to the $\frac{1}{4}$ anna piece, and should be declared by law to be a legal tender for $\frac{1}{4}$ of an anna. The words '$1\frac{1}{2}$ cent or $\frac{1}{4}$ anna' should be impressed on these coins.

VIII.—Copper coins should be legal tender for all fractions of a '*Hind*.'

IX.—The relative values of the old and new coins should be declared to be as follows:

8-anna piece	=	1	Hind 50 cents.
4-anna „	=	25	cents.
2-anna „	=	12½	„
Double pice or ¼ anna	=	3	„
Pice or ½ anna	=	1½	„
Half-pice or ⅛ anna	=	1	cent.
1 pie	=	½	„

As long as the old coins were in circulation, they should be receivable at the above rates, but the half pice or ⅛ anna should be withdrawn at once, as being not sufficiently near the 1 cent in value.

X.—As soon as the new coins are issued, the public accounts should be drawn up with the decimal sub-division of the Rupee, and all sums due or claimable in the future, whether by the Government or private persons, should thereafter be dealt with under the new system on the foregoing basis.

Note by MR. E. GAY, *Deputy Comptroller General dated 27th April* 1871.

I AM glad to have the opportunity of submitting a note upon the question of decimalising the Indian coinage.

There are two proposals in these papers,—the first, that full inquiry should be made into the matter; the second, that without any inquiry the whole of the subsidiary coinage of the country should be revolutionised.

It is impossible to object to inquiry, but I hope to be able to show reason for at least pausing before any radical change is made.

It would be tedious to go through the whole of the arguments which induced Parliament to reject the proposal for a decimal coinage in England. I will only note certain points in which the reasoning would affect India differently from England, and then see whether by these differences the objections to a decimal coinage are strengthened or weakened so far as this country is concerned.

It will be admitted that a far larger proportion of calculations is made mentally in India than in England: this arises not only from the comparative scarcity of writing materials, but from the large number of petty purchases made by the poorer classes and the numerous calculations they make of discount, interest, daily rates, and other matters that are almost unknown to the English peasant; accordingly, as we might expect, we find far greater skill in mental arithmetic in proportion to other education in India than in England.

Thus where an English boy learns the multiplication table up to 12 times 12, the Indian boy learns it to 20 times 20, or even 30 times 30. He learns also tables in verse giving rates of daily pay at so much per month, and many other questions which in England could be solved on paper.

Altogether, then, more weight should be given comparatively in India than in England to the convenience which a system affords for mental calculations.

Now the argument that chiefly weighed with the English commission in rejecting the decimal system, was its inferiority for mental calculation; they admitted fully that for philosophers, actuaries, and all persons dealing with large and complicated accounts, decimals would be convenient; but even in England they considered this outweight by the inconvenience a decimal system would cause to the masses.*

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* *Extract from Commissioner's report.*

7. "That as regards the comparative convenience of our present coinage and of the pound and mill scheme, for the reckonings of the shop and the market, and for mental calculations generally, the superiority rests with the present system, in consequence, principally, of the more convenient divisibility of 4, 12, and 20, as compared with 10, and the facility for a successive division by 2, that is, for repeated halving, in correspondence with the natural and necessary tendency to this mode of subdividing all material things, and with the prevalence of binary steps in the division of our weights and measures."

From LORD OVERSTONE'S *draft report.*

"The desirability of introducing decimals into the coinage must therefore mainly depend on the results which it would give under the remaining head of inquiry, relating to mental computations. The more the whole subject is considered, the more obvious does it become that facility of mental reckoning outweighs in importance all the other possible qualities of a system of coinage; so much so, indeed, that any decided superiority in this respect would suffice to compensate for very considerable inconveniences in other particulars. Although the superior convenience of our present coinage in some other respects is not, in our judgment, inconsiderable, the grand test of the value of the rival systems of coinage is the readiness with which they may be adapted to mental reckoning, specially to such short computations as occur on all retail purchases. Hundreds of transactions of this kind must be settled, without the aid of paper, for one calculation made with the pen. Many of these are worked, and often, it is said, very well worked, by persons not only ignorant of the processes of paper arithmetic, but unable to read and write; and we think it important to bear in mind a circumstance specially dwelt upon by Dr. Gray, Mr. Bennett, and others, that any change which would interfere with the calculations of the unlettered classes would not only affect the great majority of the population, but would fall upon persons who have not the previous education necessary to enable them to adapt themselves to a new arithmetic.

"In attributing such conclusive importance to this part of the inquiry, we are but repeating the sentiments more or less distinctly avowed alike by the advocates and opponents of decimalization. The following remarks, extracted from the extremely valuable paper contributed by Mr. Bennett, are not in our opinion at all beyond the truth:—

"'I cannot hesitate for an instant to regard retail trade as the primary object to the uses of which the currency should be made subservient. The transactions of retail trade are in the proportion of at least a thousand to one to wholesale dealings; they are in a great majority of instances the subject of immediate payment in money; and they constitute the entire sum of the pecuniary dealings of the poorer and less instructed classes, as well as a large share of the dealings of all.

"'I pass over a great many other points connected with the educational part of the question; but there is one which is much too important to be omitted,—I allude to the process of mental arithmetic, which many acquire by habit and practice alone, and which others derive from rules given by those who have deeply studied the properties of numbers. With a very large portion, unhappily too large a portion, of the community, this is the only arithmetic possible; and yet there are few men, women, or even children of ten years old, of ordinary capacity, who cannot (although entirely uneducated, in the school sense of the term) calculate in our existing coinage all the little money questions which occur to them in daily practice. The power of mental calculation necessary for this purpose has been gradually acquired, like their knowledge of most things around them, by experience; and it seems to me that nothing short of necessity should induce us to deprive them of the fruits of this experience, and to compel them, as it were, to begin the world again with a system of ideas to which they are strangers. The same thing may be said with reference to the peculiar mental calculations connected with almost every branch of trade, the facilities for which depend entirely on the varied relations which figures bear to each other in money, weights, and measures, and which would be abolished under a decimal system. Within the last twenty or thirty years specially, the art of mental calculation has been brought to great perfection with reference to almost all the purposes of life; its great advantages are manifest; it forms an important part of the education of all who are engaged in trade; and yet it is proposed, by way of improvement, to render all the commonly practised methods of this art useless or impracticable.'"

"Indeed, the emphasis with which almost every witness has asserted that the convenience of retail transactions would be best promoted by the system of coinage which he recommends, is in itself a very marked acknowledgment of the extreme importance of this part of the subject."

Again, it can hardly be denied that the people in India are more suspicious of the action of Government than in England; but even there the resistance to change was expected to be formidable. The definite proposal now put forward is to introduce the change at once, and in doing so to assume "that there would be no appreciable difference for purposes of retail trade between 1 pie and one two-hundredth part of a rupee." The difference is precisely 4 per cent, and the extract from Lord Overstone, which I add in a note,* appears an exact answer by anticipation to both proposals even disregarding the special dislike to change on the part of an Indian population.

There are also in India considerations differing in kind as well as in degree from those which influenced the English Parliament.

In this country the names and relations of the present coins are applied to other matters of daily life in a way unknown in England: thus a person is not said to have "a quarter" but "a four annas share;" in fact, ordinary fractions are expressed by means of money, the Rupee being taken as the unit, and its divisions representing the fractions, and for such a purpose a decimal division is notoriously ill adapted.

A practical objection to any change of coins in India arises from the imposition always practised in such cases on the ignorant people. When we know that the money changers took batta on the plea that the Rupee on which the Queen's head had curls was of different value from that on which there were no curls, it is easy to see the fraud that would be practised with coins of entirely new names and value.

The admitted objection that our stamps are calculated on the present coinage is no doubt important, but it is no more so in the case of the price of stamps than in the prices of all other commodities which have gradually conformed to the existing coinage; in that special case it would also inconvenience the Government, in the thousand other cases it would only inconvenience the people.

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* *From* LORD OVERSTONE'S *draft report.*

"In his evidence before the late Parliamentary Committee (532), Sir John Herschel says of the proposal to introduce a decimal coinage,—'It cannot be expected that it should not present itself to the lower classes under a repulsive aspect; and without allowing a sufficiently long interval for preparation, and duly familiarizing these classes with the expectation of a change, and giving them an idea of what that change will consist in, it will be quite sure to encounter a very formidable resistance.' It is not easy to see how the people are to be familiarized with the change, except by the gradual circulation of new coins intermixed with our present money. The confusion which would result from the co-existence of two copper coinages differing 4 per cent. in value, is a serious thing to contemplate; but the only other alternative is to disregard Sir John Herschel's warning, and make a sudden change by law in the value of the existing coins, in lieu of issuing new pieces to represent the new values. The requisite alteration in the legal value of the vast mass of copper coin in the country, and of the smaller silver coins, would involve a loss falling on the poorer classes, which may be estimated at 50,000*l*. This would be felt as an act of arbitrary injustice by every one who suffered by the change, and there would therefore seem to be no option but to call in the old coins and issue new ones, with such moderate speed as the extent and difficulty of the operation, and the necessity of avoiding harsh measures of compulsion, would allow. Two systems of coin would therefore remain for some indefinite period, circulating side by side, and our coinage would certainly, during all this time, be worse than that which we have at present. No one who has experienced the inconvenience of the current coinages met with in various parts of the continent would willingly admit the evil, for any considerable time, into this country, even though one of the rival systems should be theoretically perfect. How long this confusion would have to be endured we shall not attempt to predict, but it could scarcely fail to extend over many years."

It is worth notice that, even where a decimal system has been long established, it is constantly ignored in common parlance. A peasant in France will speak of "6 sous" not "30 centimes;" this is still more universal in Belgium;* while even in America the lower orders speak of "a quarter" not 25 cents.

It may be said that this fact removes part of the objection to the plan that, if the people found the change inconvenient, they would ignore it. Supposing, however, that the new system does no good, it will certainly do great harm; not only will the people be liable to extortion when they come in contact with the legal system, but anything which tends to widen the distance between the government and the governed in social matters is much to be deprecated.

On the other hand, it may be possible to enforce the adoption of the system, but if such competent judges as Lord Overstone and Sir J. Herschel (who take opposite sides on the decimal question generally) agree that a difference of 4 per cent. will cause a very appreciable loss to the poor, it may well be considered what would be the political effect of enforcing such a measure in India.

Memorandum on the decimal sub-division of the Rupee from GUILFORD L. MOLESWORTH, ESQ., *Consulting Engineer for State Railways.*

Introduction into Ceylon.

IT is now more than five years since I first mooted the question of decimalizing the rupee in Ceylon. At first the measure was opposed, but the opposition gradually diminished as its fallacies were demonstrated; for, when the proposed change was clearly explained, both Europeans and Natives approved of it, and even many of those who had originally been its active opponents were converted into warm supporters, so that the memorial, praying His Excellency the Governor to adopt the decimal sub-division of the rupee, contained a larger number of signatures from all classes than any petition that has ever been laid before the Government of Ceylon, and I now learn that the measure has just received the sanction of the Secretary of State for the Colonies. I trust that India will soon inaugurate a similar policy. I admit that Ceylon is but a small country in comparison with India, and that changes can easily be made in it which in India are fraught with difficulty, owing to the magnitude of the country; but, on the other hand, India possesses, as I shall presently show, elements which afford greater facilities for decimalization than existed in Ceylon, or, in fact, in any other country in the world. At the same time the subject requires in India a treatment slightly different from that which has been adopted in Ceylon.

Difference between India and Ceylon.

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* *From* LORD OVERSTONE'S *draft report.*

"In Belgium, where the French coinage was introduced in the last century, and finally established by the law of 1832, the transition has been so imperfectly effected, that we are informed that 'in usual life every man in Belgium is compelled to have constantly at hand his tables of reduction of the various moneys, both past and present.' At Antwerp goods are bought and sold in Netherlands money, though, in deference to the law, public sales take place in francs and centimes. The majority of merchants are said to have adopted the legal system of accounts; but small sums connected with the people's daily dealings are generally mentioned in Brabant guilders and stuyvers; farmers and all shopkeepers, specially in the Flemish provinces, still continuing to use the old denominations of coin."

As I learn that my original paper on this question was last year officially laid before you, it is unnecessary for me to recapitulate the arguments therein used, or to show how the question of tolls, stamps, and contracts, may be met without difficulty: it is sufficient for my present purpose to add that I would suggest for India a slight modification of the plan originally proposed for Ceylon. The present silver coinage should remain unaltered, and the coinage I recommend will then stand as follows:

Modifications proposed for India.

Proposed Coinage.

Description of Coins.		Value in cents.	Value in fractions of a Rupee.
Existing Silver Coins	Rupee	100	1
	8 Anna piece	50	½
	4 „	25	¼
	2 „	12½	⅛
New Copper Tokens ...	1 cent	1	1/100
	½ „	½	1/200

The lowest token would then be half a cent., or the 200th part of a rupee, (the pie is the 192nd part of a rupee).

It may be objected that the coinage of a *half* cent. is a violation of the decimal principle; but as Professor de Morgan has ably pointed out, "the mere having of the lowest coin is no disadvantage, it is the abiding delusion of the opponent of decimals that he *will* suppose the decimalist to be under a contract, never to use common fractions." Moreover, the half cent is of so low a value that practically it will not be introduced into accounts. In the accounts of the Public Works of the Government of Ceylon, the farthing (which is about double the value of the half cent) was excluded, although a coin equivalent to the half farthing was in universal circulation.

The Half-cent.

Before I proceed to show how the decimal sub-division may be introduced without difficulty, I must premise that it is admitted even by the most stubborn opponents of change that for all "paper transactions" (that is, for all calculations on *paper*, in contradiction to *mental* calculation), the decimal system possesses great advantages. I must also meet the popular fallacy which so many even amongst the educated classes entertain, that, in the event of a decimal coinage being introduced, it will be necessary for those who have forgotten their school lore to learn again decimal arithmetic. Nothing can be more fallacious than such an idea. No special preparation is necessary to enable any one to understand and use a decimal sub-division, but those who do use a decimal coinage are unconsciously, and without an effort on their part, *taught* decimal arithmetic, the only difficulty is the slight effort of memory necessary to remember that the half-rupee represents 50, the quarter rupee 25 cents, &c.—a difficulty that could not be one of many days duration even with the most stupid.

Advantage in paper transaction.

Knowledge of decimal arithmetic not necessary.

Premising this, I propose for the introduction of the decimal system nothing more than the coinage of a small quantity of copper tokens, and an enactment to legalize their circulation. It may be asked what advantage is to be gained by this course? Simply that the fact of such tokens being in circulation would admit of agreement for rates of labor, contracts, and accounts under the decimal denomination; in fact, it would allow facilities for "paper transactions" in decimals. The plan might be introduced first in one district on a small scale, and, when successful, it might be gradually extended, and finally adopted throughout India.

Issue of Tokens.

Then comes the question: What machinery would you adopt for the introduction of such tokens, if minted, and what will be the practical working of such an introduction? To this I answer, that there can be no better opportunity for a commencement than in the construction of one of the State Railways on which I would introduce them, but always with the proviso that if it would be found to be prejudicial to the labor market, it should not be pressed. I would select that district which, after careful consideration, I found to afford the fewest obstacles to the introduction, and provide the treasuries in the vicinity of the railway with a supply of the new copper tokens; these tokens should not be used to make entire payments, but simply to meet the balance of those sums which may not exactly coincide with the old system. For instance, supposing 5R. 30Cts. to be due to a man, he would receive 5 Rs. a four anna piece, (25 cents,) and 5 copper cents.

Machinery for introduction of Tokens.

It may be urged that the natives will receive such tokens with reluctance, but a little reflection will show that there is no ground for supposing that the new tokens will not be received by the natives as readily as the existing legal tokens, for so long as the natives are allowed to coin "dumps," and thus make a profit by usurping the prerogative of the Crown, the "dum" will be in favour rather than the legalized token, which circulates at a *nominal* value far higher than its *intrinsic* value; but in spite of the reluctance of the natives to receive the pie, it is evident that Government must make its payment by means of a *legalized* token, and I cannot think that the cents would be looked upon with less favor than existing tokens. On the contrary, it is probable that the natives will prefer tokens which they can get at the rate of 200 to the rupee to those which are only issued at the rate of 192, more especially if the former be made (as they can be made with profit) slightly more bulky than the pie tokens. Even should any reluctance be manifested on the part of the natives to receive the new tokens, they can be informed that 100 cents will be taken in exchange for a rupee at all the Government Treasuries and the Railway Pay Offices.

Reluctance to receive new Tokens.

I lay a stress on the necessity for using *copper* and not bronze as the metal for these tokens, because the natives, as a rule, like as much metal as possible for their money, and this will account partially for the preference accorded by them to the "dum," which contains a larger proportion of metal than the legalized tokens. The "dumps," which I have examined, fluctuate in value from 2½ to 3 pie per "dump," whilst in weight they equal 5 pie.

Necessity for using copper.

The introduction of new copper tokens presents no greater difficulty than the introduction of the three-penny and four-penny pieces in England; the Government of India cannot be compromised by such a step, as it is committed to nothing beyond the cost of minting the tokens. If successful, as I believe it must be, the introduction of a decimal system will confer a great boon on India, and if not, the coinage of the small quantity of tokens necessary to make the experiment is a matter of no moment. We have at present an inconvenient system of copper tokens which are not acceptable to the masses in India. Why not change it for one that will be eminently valuable? I do not ask for

Feasibility.

any sudden alteration in the accounts of Government or in the stamp and tolls; the measure I propose will merely affect the internal working of the construction accounts of that State Railway upon which it may be adopted, but it will serve to demonstrate the possibility of extending the principle. Should the trial be successful, there will be no difficulty in gradually calling in the old copper tokens, and the final change may after a time be easily made.

Objections.

I will now deal with some of the most plausible objections that have been urged against decimalization. Four* commissions or committees in England have reported in favour of decimalization, but a fifth commission (Lord Overstone's 1859,) arrived at conclusions adverse to its adoption.

* Standard Commission of 1841.
Decimal Commission, 1843.
Committee of House of Commons, 1853.
Standard Commission, 1869.

Lord Overstone's Commission.

Lord Overstone, though an able man, was evidently strongly prejudiced against any change, and acted rather the part of the indiscreet partizan than that of the impartial judge. His questions were so palpably unfair that Sir John Herschel, Professor deMorgan, and others pointed out the "unfairness" and "one-sideness" of the questions put to them, and even Mr. Hemmings, the barrister employed by Lord Overstone to revise the evidence, and to attempt to weaken the weighty testimonies of such men as the Astronomer Royal, Sir John Herschel, and Professor deMorgan,—even he was forced to admit that they were unfair. The arguments used in the report of that commission will, therefore, be the strongest that can be urged against decimalization. Now, even admitting for the sake of argument, that the rejection of decimals by Lord Overstone was desirable in the case of England, the strongest reasons adduced by him have no force in India. The great and really the only real objection is in fact the general aversion of all classes to any change, and the attachment of the lower classes to the copper coinage, in consequence of their long use of it. A few ingenious arguments have been urged, such as the facilities afforded by the existing system for mental calculation, but they are simply raised to back up the main question, and are literally of no weight when compared with the difficulty of disturbing the existing copper tokens. Now, such a difficulty does not exist amongst the masses in India; the legalized copper tokens are rejected by the lower classes, and the illegal "dump" of fluctuating value, the native and spurious coins, and the cowrie are very generally substituted for it as the medium for circulation. Still we *must* have *legalized* copper tokens, and we might just as well adopt that form which is universally acknowledged to be the best.

The penny difficulty.

Mental calculations.

In the report of Lord Overstone there appears the following remarkable assertion: "For mental calculations generally the superiority rests with the present system in consequence principally of the more convenient divisibility of 4, 12, and 20 as compared with 10, and the facility for a successive division by 2." Now, even without the assertion of the Astronomer Royal, that the present system is unsuited to mental calculation, whether small or great, it must appear startling to any unprejudiced mind that a system involving three distinct and different bases (or as Professor deMorgan rightly terms it the "quarto-duodecimo vicesimal coinage") should give greater facilities than that which involves but one base, and still more startling does it appear when one of the three favoured bases is practically the same as the single one which is condemned.

Lord Overstone appears to have overlooked the fact that in a decimal system it is possible to dispense with sub-division to a great extent, and to substitute the more easy process of multiplication for the more complicated process of division. Let facts speak for themselves. How many people in England are able to make use of mental calculations in any cases, but those of the most simple

character? Not one in 100! even amongst the educated classes; the so-called "binary"* system does not admit of it. Contrast this with China where the decimal system is in full force. The lower orders of the Chinese perform mental calculation with a facility and rapidity that is impossible under the "binary" system even to well educated men in England. To a mind accustomed to one system, that system, however imperfect it may be, gives the greatest facilities for mental calculation; and I have no doubt that to most Englishmen the so-called "binary" system is the most easy for such calculations; but any man will find, as soon as he has become accustomed to the change, that his power of dealing mentally with figures and numbers will be greatly increased by a decimal system.

Chinese calculation.

Basing an argument on Lord Overstone's startling assertion, one objector urges: "We find greater skill in mental arithmetic in proportion to other education in India than in England." Now this aptitude on the part of the natives appears to me to be the strongest argument possible in *favour* of decimalizing. I observed the same aptitude in Ceylon, and I even found that many of the natives who were entirely ignorant of the first principles of our arithmetic were able to deal with quantities and sums by means of a species of mental calculation with a rapidity that would be impossible on the "binary" system, and this they effect entirely on a system of rough decimals by means of their fingers, and by heaps or rows of *ten*. I had, moreover, occasion to introduce into the Public Works at Ceylon decimal measures of the foot, to supersede the existing medley of cubic yards, heaped bushels, struck bushels, gallons, &c., and I found that the Native Overseers, both Cinghalese and Malabar, evinced an aptitude that surprized me; for, though they were at first averse to the change, they soon became accustomed to it, and in a few weeks not only used the new measures easily, but actually preferred them to the old system to which they had been so long accustomed, and there is little doubt that the natives of India with their natural aptitude for figures will not be slow to appreciate and use the advantages afforded by the decimal system.

Aptitude of Natives for figures.

Another argument has been based on the fact that in France peasants still speak of "sous" instead of "centimes," and in America they adopt the term "quarter" in preference to 25 cents: this, however, proves nothing except that they adhere to the old nomenclature; but even admitting this difficulty to be real, can Lord Overstone deny that the introduction of the decimal system in those countries has conferred benefits far outweighing any such difficulties? On the contrary, he admits that "the reports which have been received from foreign countries, where the decimal principle has been introduced, *concur generally in the statement that the system has been found to work satisfactorily*, and to be an improvement on their previously existing forms of coinage." Whilst admitting so much, an endeavour is made to weaken the force of this concession on the following points:

Advantage in other countries.

First that in most countries where a decimal coinage has been introduced, decimal weights and measures have been adopted also, and these give great facilities for a decimal coinage; it is admitted, however, elsewhere that, even without this uniformity, the decimal coinage has not worked inharmoniously in America. But even were it not so, this argument has no force in India where the decimal weights and measures have received the approval of the Legislature.†

Harmony with Decimal weights and measures.

* I use the term binary though it is somewhat a misnomer, because there is no convenient term by which our heterogeneous medley of 20, 12, and 4 may be described.

† I see by the papers that a bill is now about to be brought before Parliament for the introduction of decimal weights and measures into England, and that it is warmly supported by the Chambers of Commerce.

The second reason for modifying the verdict in favor of decimals is that those countries which have adopted it have contrasted it with their previous coinage which has been very imperfect; and to the Englishman, averse to change, the £ *s. d.* system *is* perfect until he has had sufficient experience in a country where decimals are used to enable him to appreciate the practical results of that system. Certainly the £ *s. d.* system is perfect when compared with the Indian "anna," "pie," and "dump" system.

Contrast with imperfect systems.

The third objection was that the foreign systems generally consisted of an unit comprising 100 sub-divisions, whereas the system proposed for England contemplated 1,000 sub-divisions. The plan I propose is not open to this objection, as it only comprises 100 sub-divisions like those adopted in the majority of foreign countries.

Number of sub-divisions.

The commission also objected to the proposed system, because it consisted of four distinct denominations *viz.*, "Pounds,' "Florins," "Dimes" and "Mils," whereas other decimal coinages in existence consist of two denominations only. This objection is again inapplicable to the system I propose for India which contains only two denominations, *viz.*, Rs. and Cents.

Number of denominations.

It has been objected that the new tokens of $\frac{1}{100}$ in value, if introduced, would practically take the place of the existing tokens of $\frac{1}{96}$, and that the difference of 4 per cent. would probably fall on the lower classes in the minor commercial transactions. Such an argument *might* have weight in England where the legalized penny is universally accepted at an unvarying rate; here, however, it has no force because the "dump" is practically (though not legally) the copper coinage of India, and it is subject to fluctuations of more than 12 per cent. Nor can the "dump" be said to be a "binary" division, for it is now being circulated in Simla at the rate of 70 to a rupee. It is evident, then, that the change from the pie to the cent could not affect the smaller transactions of trade. It has been said that a new coin will give opportunity for the buniahs to oppress the poorer classes, but can anything give greater opportunities for oppression than the "dump system."

Retail transactions.

I presume that the Indian Government look forward to the ultimate education of the masses, and a decimal system is a valuable auxiliary in education, because it enables the partially educated man to reach by means of *simple* arithmetic—a point which, under the "binary" system, he cannot attain without the aid of *compound* arithmetic. It has often been asserted that the "decimal system is admirable for the mathematician, but it is of no advantage to the poor man." On the contrary, it is merely a luxury for the mathematician, whilst it is a positive necessity for the man at the foot of the educational ladder; in fact many a man stops short in education daunted by the difficulties of compound arithmetic, but yet unable to make a practical use of his knowledge under the "binary" system.

Education.

It has been urged that the Native mind has been so long accustomed to "binary" sub-divisions that the decimal system would be a hindrance to him; but, on the other hand, there are indications of a tendency to decimalization amongst the natives which show that there is not much weight in this argument. The larger divisions of money, the rupee, the sau, the lakh, and the crore are essentially decimal and thoroughly Indian. Again, I learn that it is a very common practice to sell by the *hundred* produce that cannot be sold by weight. I am informed that the freight of boats is by the *hundred* maunds. The proprietors charge royalty on their jungle produce at so much per *hundred*, and I have no doubt that this practice enters largely into small commercial

Native tendency towards decimalization.

transactions; at all events it shows that the Native mind is not averse to decimal notation in spite of the difficulties under which he labours in consequence of the existing coinage.

To sum up my arguments—

(1.)—The decimal sub-division of the rupee has been approved for Ceylon.

(2.)—India offers special facilities for its adoption.

(3.)—The change necessitates no alteration whatever in the existing silver coinage.

(4.)—All that is necessary is to mint a small quantity of copper tokens.

(.)—The change may be made gradually.

(6.)—No sudden alteration is necessary in the accounts, stamps, or tolls.

(7.)—The natives will receive the new tokens as readily as they receive the existing tokens.

(8.)—The great objections urged against the adoption of decimals in England are inapplicable here.

*(9.)—The lower classes have no attachment to the existing copper tokens.

(10.)—The copper circulating medium in India is virtually not even "binary," but fluctuating.

(11.)—The adoption of the decimal coinage will harmonize and work well with the proposed decimal weights and measures.

(12.)—The coinage I propose is free from the objections urged against that proposed for England both as regards the number of sub-divisions and denominations.

(13.)—The introduction of decimal tokens will not affect retail transactions.

(14.)—The decimal system will be a valuable auxiliary in education.

(15.)—The natural aptitude of natives for figures will facilitate the adoption of decimals.

(16.)—The native mind is not averse to decimalization.

No doubt there will be difficulties as there must be difficulties in every change; but are they of such a nature as to justify us in allowing them to be a bar to progress? The advantages of decimalization are self-evident, and the tendency of all civilized nations is to adopt it. The question ought not to be regarded from a narrow point of view, but in a wide liberal spirit, contrasting the minor difficulties of introduction with the benefits that must accrue from the change not merely to the present race, but to future generations.

SIMLA;
The 10*th July* 1871.

GUILFORD L. MOLESWORTH.

* See the List of Native coins appended hereto.

APPENDIX.

The following list of some of the Native Coins and their value will suffice to show how small an element of the so-called "binary" system exists in India. Even the legalized tokens are not "binary," but fluctuate in India :

District or Presidency.	Name of Native Coins in circulation.	Number usually exchanged for a Rupee. From	To	Remarks.
North-West ...	Agra pice	72	100*	* Equal to a cent.
	Alumghini	...	...	Sold by weight.
	Balashahee	63	63½	
	Bhurtpore	...	...	
	Delhi	80	84	
	Ghisla	50*	...	Equal to 2 cents.
	Goruckpore	64½	71	Fluctuates to 3 cents.
	Jhardar	41	44	
	Munsoorie	66*	84	Fluctuates to 3 cents in value.
	Nawabee	64½	65	
	Pukka pyce	48	...	
Punjab ...	Cabullee pice	120	128	
	Chukle	79	...	
	Jummoo	95	...	
	Munsoorie	66	68	Fluctuates to 3 cents in value.
	Nanuckshahee	80	100*	* Equal to the cent in value.
	Takkas	41½	42	
	Thova	47½	...	
Oudh ...	Mudhooshahee	50*	...	Equal to 2 cents in value.
	Munsoorie	66	74	Fluctuates to 3 cents in value.
	Nawabee	64½	70	Fluctuates to 3 cents.
	Nepal	71	...	
Rajpootana ...	Jeypore pyce	47	50*	Equal to 2 cents.
	Jodpore			
	Kolah			
	Munsoorie	64	66	Fluctuates to 3 cents in value.
Central India	Balashee	58	59	
	Chowdoree	60	...	
	Guzashee	58	...	
	Gwalior	86	...	
	Indore gundas	10	...	Equal to 10 cents.
	Kotah	42	...	
	Kutcha pyce	80½	...	
	Moharaja	67	67½	
	Nunda	80	86	
Bengal ...	Badsahee	65½	...	
	Goruckpore	68	70	
	Lohya	100	...	Equal to 1 cent.
	Nepaulese	96	...	
Bombay ...	Babasayee	66	...	Equal to 3 cents nearly
	Dhaboo	32	...	
	Ghatty paisa	48	...	
	Mysore	60	64	
	Shewrai	66	...	Equal to 3 cents nearly.

In the Madras Presidency very little Native coin appears to circulate, but the value of the Government pie fluctuates in the bazaars from 192 to a rupee up to 200, br *exactly half a cent.* (at Malabar, Calicut, and Poonamally).

Throughout India the Government pie fluctuates considerably in value, from 192 to 204 pies per rupee, so that in some places (Berar, Mahoda, Bhundara, Lakolee, Chundah, and Nagpore) the pie circulates at a value *lower than the half cent.*

GUILFORD L. MOLESWORTH.

Extract from a letter from G. L. Molesworth, Esq., *to* M. E. Foster, Esq., *of the Treasury, on the subject of the Ceylon Coinage,—dated 11th March* 1871.

"The contemplated changes in the currency of India must be confined to one of two alternatives ; and to either of these alternatives the decimal sub-division proposed for Ceylon would be admirably adapted.

"The first alternative would be to introduce British sovereigns into India, and make the rupee a token (instead of a coin) representing $\frac{1}{10}$th of the sovereign. The rupee having intrinsically a value very slightly in excess of the English two shilling piece, though as a *coin* its value is less than $\frac{1}{10}$th of a sovereign.* As, however, there appears to be a financial difficulty in this course, the second alternative would probably be adopted, *viz.*, to coin a gold piece worth Rs. 10 or about 6 per cent. less value than the sovereign, and to keep the rupee as at present, a coin unchanged in value. In the former alternative if the rupee were considered a *token* representing $\frac{1}{10}$th of a sovereign, the copper tokens would still retain their relative value to the rupee ; whilst in the second alternative both the rupee and the copper tokens would remain unaltered, but in both cases the copper tokens would be decimals of the gold coin.

* *Note.*—The Rupee contains 178½ grains of silver, whereas the florin contains only 174½ grains.

"Nearly all changes in currency tend towards decimalization, and even should some other denomination than the rupee be adopted in India (which it is difficult to conceive), the change from one decimal system to another would be easy, and the fact of a decimal system existing in Ceylon would pave the way to any movement in that direction in India."

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Rain-fall and Agricultural Prospects in Bengal, Madras, and Oudh.

Statement shewing rain-fall, weather, and state and prospects of the crops in the different Districts of the Lower Provinces of Bengal for the week ending 29th July 1871.

Number.	District.	Date of return from each District.	Rain-fall at Sudder Station in inches.	Character of the weather in the District as far as known.	State and prospects of the crops at date.	Remarks.
1	Bhaugulpore ...	July 29th	6·3	Rainy in North and South.	Ous generally damaged, Amun very good.	
2	Monghyr ...	„ 22nd	3·9	Favorable ...	Fovorable.	
		„ 29th	6·7	Favorable generally.	Bhadoi partially damaged Paddy cheerful.	
3	Purneah.					
4	Godda.					
5	Nya Doomka ...	„ 29th	2·4	Seasonable ...	Very favorable.	
6	Rajmehal ...	„ 29th	4'	Easterly winds. Little cloudy.	Very good. Jenarah poor owing to much rain.	
7	Deoghur ...	„ 29th	2·1	Very favorable...	Very good.	
8	Burdwan.					
9	Bancoorah.					
10	Beerbhoom ...	„ 22nd	3·1	Generally cool ...	Transplanting begun. A little more rain would be good.	
		„ 29th	2·5	Some heavy showers.	Very good. A little more rain in some parts is desirable.	
11	Hooghly.					

Number.	District	Date of return from each District.	Rain-fall at Sudder Station in inches.	Character of the weather in the District as far as known.	State and prospects of the crops at date.	Remarks.
12	Howrah ...	July 29th	3·0	Favorable ...	Very flourishing on high lands; failure where the water is deep.	
13	Midnapore ...	„ 29th	1·3	Ditto ...	Good, but it depends on the continuance of rain.	
14	Chittagong.					
15	Tipperah.					
16	Bullooah.					
17	Dacca.					
18	Backergunge ...	„ 22nd	4·9*	Rainy ...	Good ...	* From 1st January to 15th July 1871, 51·8 inches.
19	Furreedpore.					
20	Mymensingh.					
21	Sylhet ...	„ 24th	4·5	Rain in abundance.	Most satisfactory.	
22	Cachar.					
23	Cuttack.					
24	Balasore ...	„ 29th	·6	Close and steamy, but not unhealthy.	Good.	
25	Pooree.					
26	Nuddea ...	„ 29th	4·3	Generally favorable. Much fever at Ranaghat and Sudder.	Generally flourishing.	
27	Jessore.					
28	24-Pergunnahs.					
29	Patna ...	„ 29th	3·4	Rather rainy ...	Bhadoi much injured. Paddy promising.	
30	Gya.					
31	Chumparun.					
32	Sarun.					
33	Shahabad ...	„ 28th	2·0	Heavy rains ...	Bhadoi crop injured by early rain. Rice promises well, and sugarcane excellent.	
34	Tirhoot.					
35	Rajshahye.					
36	Begrah ...	„ 21st	5·8	Cloudy and squally.	Good.	
37	Dinagepore ...	„ 22nd	8·8	Wind variable and constant showers.	Favorable.	
38	Maldah ...	„ 22nd	4·8	Continual rain ...	Fair.	
39	Moorshedabad.					
40	Pubna.					
41	Rungpore.					
42	Lohardugga.					
43	Hazareebaugh ...	„ 29th	3·8	Seasonable ...	Very favorable, but more rain wanted.	
44	Maunbhoom ...	„ 22nd „ 29th	4·9 1·3	Favorable ... Ditto ...	Favorable. Thriving.	
45	Singbhoom.					
46	Durrung.					
47	Kamroop.					
48	Luckhimpore.					
49	Nowgong.					
50	Seebsaugor.					
51	Darjeeling ...	„ 21st	61·2†	Very rainy, but seasonable and healthy.	Hill crops in good condition.	† From 1st January 1871.
52	Gowalparah.					
53	Julpigoree ...	„ 22nd	3·2	Seasonable ...	Fair.	
54	Cooch Behar ...	„ 22nd	‡	Good deal of rain.	Good ...	‡ No rainguage kept.
55	Hill Tracts of Chittagong.					
56	Khasi and Jyntcah Hills.					
57	Garo Hills.					
58	Pakour ...	„ 29th	·8	Dry ...	Janerah half expected. Paddy good.	

N. B.—The columns of the Districts from which returns have not been received, remain blank.

Remarks on the state of the Season in Madras for the month of June 1871, *Fusly* 1280.

	Districts.	Season.		Crops.			Prices.	Public health.	Cattle.		Remarks.
		Rain-fall.	River-freshes.	Sown.	Standing and their condition.	Harvested and their out-turn.			Condition.	Pasture.	
Northern Section.	Ganjam ...	Abundant ...	Freshes in the Langoola and Vumsadhara Rivers.	Paddy	Gingelly, Raggy, Gunteiu, Dholl, Samaloo, Cotton, Sugar-cane, and Lampoil Seeds, good.	.....	Declined ...	Good	Disease in Kimedy and Chicacole.	Sufficient.	
	Vizagapatam...	Slight but general	Slight freshes ...	Paddy, Raggy, and Cumboo.	Good	.....	Stationary ...	Good on the whole ...	Good	Plentiful.	
	Godavery ...	Scanty and partial.	Freshes in the Godavery and Yeleru.	Gingelly, Oil-seed, Gantai, Kandi. Mokka Jonna, Cotton, Black Paddy, and Paddy	Sugar-cane, good ...	.....	Rising ...	Small-pox general; slight cholera in Ellore.	Ditto	Good.	
	Kistna ...	Slight ...	Freshes in the Kistna	Gidda Jonna, and other dry grains in up-land taluqs.	.....	.....	Rose	Small-pox, Guinea-worm, and Cholera prevalent; 47 deaths from the last-named disease reported.	Suffering from disease	Good; water-supply insufficient.	
	Nellore ...	Slight ...	Slight freshes in the Pennair tanks in Rapur and Udayagiri; received small supplies.	Indigo, Sajja, Kesari, Nalwari, and Gidda Jonna.	Good, except Gingelly, which suffered from want of rain.	Indigo, Sajja, and Polipu Jonna; out-turn very good.	Declined in Udayagiri, Kandukur, Kanigiri, and Ongole.	Fever, Small-pox, and Cholera exist.	Disease severe and general.	Abundant, except in Rapur, Codile, Kangiri, and Udayagiri.	
Ceded Districts.	Cuddapah ...	Slight, but somewhat general.	Pennair fresh, 3 yards high.	Sajja, Korra, Oil-seed, Cholam, Paddy, Raggy and Indigo.	Indigo, Raggy, Cholam, Sajja, Paddy and Sugar-cane, generally good; in parts suffering from blight.	Indigo, Cholam, and Tobacco; out-turn ⅓th of a full harvest.	Declining ...	Ditto ...	Generally good ...	Moderate.	
	Bellary ...	Scanty ...	Freshes in Toongabudoa, Pennair, and Huggry.	Early dry crops ...	Good ...	The Bysack crop ...	Almost stationary ...	Generally good ...	Ditto ...	Abundant.	
	Kurnool ...	Slight ...	Freshes in all the rivers	Yellow Jonna, Korra, Oil-seeds, Horsegram, Sajja, and Turmeric.	Good in Koilkuntla and Cumbum, suffered from drought in Nanddial and Pattikonda.	Indigo in Koilkuntla	Ditto ...	Small-pox, Fever, and Guinea-worm, here and there.	Murrain in Koilkuntla.	Scarce; dry fodder plenty.	
East Centre.	Madras ...	Ditto ...	.....	In Madras, all lands are covered by certificates and grants, and no account is kept of their cultivation.			Ditto ...	Good ...	.....	.....	
	Chingleput ...	.....	.....	Not received as yet.							
	North Arcot...	Slight and partial.	.....	Cumboo, Gingelly, Red-gram, Indigo, Raggy, Paddy, and Sugar-cane.	Good in four taluqs, withering elsewhere.	Indigo and Paddy ½ to ¾th harvest.	Paddy, Rice, Raggy, Black-gram and Salt rose; others slightly declined.	Good, except in Chendragiri and Palmanair.	Bad in Wallajat, Wandewash, Chittoor and Palmanair.	Generally sufficient.	
	South Arcot...	Ditto ...	Slight freshes in the Coleroon and Mani Mooktanady.	Kar-Paddy, Sugarcane, Raggy, Cumboo, Veragoo, Gingelly, and Indigo.	Good ...	Kar-Paddy, Indigo, and Gingelly Oil-seed, good.	Slightly fluctuated ...	Fever, Guinea-worm, and Small-pox here and there.	Vechai ...	Just sufficient.	Scarcity of water was, to some extent, felt in the Trinomalay taluq.
Cauvery.	Tanjore ...	Slight but general.	Ample freshes in the Cauvery and other rivers.	Kaduppukar and Kuruvai.	Vegetables, good ...	Kar, Gingelly and Raggy, ¾th harvest.	Almost stationary ...	Generally good ...	Good ...	Sufficient.	
	Trichinopoly...	Scanty ...	Ferequent freshes in the Cauvery.	Mauri Kar, Raggy, Gingelly, and Turmeric.	Valan crops, good. Dry crops suffering from insufficient rainfall.	Kar-Paddy, Sugarcane, and Cholam, poor.	Ditto ...	Ditto ...	Ditto ...	Scarce in the drier parts.	Scarcity of water was felt in parts of Oodayar Coliem.
	Madura ...	Ditto ...	.....	Raggy, Cumboo, Cholam, Paddy, and Gingelly.	Generally good ...	.....	Tendency to fall ...	Ditto ...	Ditto	Not sufficient.	
	Tinnevelly ...	Slight ...	Moderate freshes ...	Kar-Paddy, Cholam, and Raggy.	Paddy, Gingelly, and Cholam, good.	Cholam and Gingelly, moderate.	Rose slightly ...	Ditto ...	Ditto	Abundant, except in Settur, Oottipedaram, and Tenkarai.	
	Coimbatore ...	Extremely partial.	Freshes in all the rivers	Cholam and Paddy ...	Good ...	Gingelly and Cholam good in some places, and poor in others.	Almost stationary ...	Cholera prevalent in Collegal, Bhowany, and Palladam.	Bad in parts of the district.	Procurable.	
	Neilgherries...	Plentiful ...	.....	Samai, Kadalay, Ganjay, Wheat, Keeray, Mustard, and Potatoes.	Coffee thriving ...	.....	Stationary ...	Good ...	Good ...	Plentiful.	
	Salem ...	Slight ...	.....	Cholam, Raggy, Cumboo, Samai, Verajoo, and Gram.	Cumboo, Raggy, Gingelly, Paddy, and Sugar-cane, tolerably good.	Cholam, Gingelly, Paddy, and Cotton, indifferent.	Ditto ...	Cholera and Fever in a few tracts only.	Ditto ...	Sufficient.	
	South Canara	Good ...	Not heavy ...	1st Crop Rice ...	Promising ...	.....	Rose slightly ...	Fever in the interior of the district.	Ditto ...	Plentiful.	
	Malabar ...	Heavy and seasonable.	.....	Ditto ...	Good ...	.....	Falling ...	Generally good ...	Ditto ...	Sufficient.	

previous history of the survey, has, since the date of Colonel Walker's report, fallen a victim to his zeal for the public service.

7. The revenue surveys in the Bengal Presidency, under Colonel Vanrenen and Major Macdonald, have covered an area of 21,054 square miles during the season under review, and I perceive that some useful levelling work has been added, which will greatly enhance the value of the maps. Their interest is also increased by careful delineation of the ancient and present beds of rivers which have changed their courses, as in the Cooch Behar District, where this feature has been attended to. The illustration of comparative geography is often useful to the historian and the antiquary, while the changes that are thus indicated not unfrequently supply practical suggestions to engineers and administrators. An instance of the general utility of these maps is given in a letter from the Engineer of the Indore State Railway, who reports that, in Nimar, they saved the necessity of making fresh surveys for the railway, and aided and expedited his progress very materially.

8. Colonel Thuillier has pushed forward his very useful and ably-conceived topographical surveys with his accustomed zeal, and has, during the last season, furnished a considerabe amount of new material for portions of the Atlas Sheets. I have noticed the first issue of the two quarter sheets of the Indian Atlas in a separate despatch, but the efficient way in which the lithographic and photo-zincographic branches of Colonel Thuillier's Office are conducted, are deserving of equal commendation. The speedy issue of the results of the surveys in progress, and the way in which the enormous and rapidly-increasing demand for maps is met, bear striking testimony to the administrative talent of the Surveyor General and to the zeal and ability of his staff. Captain Murray and Lieutenant Waterhouse have seconded the efforts of their chief in a way which specially elicits my cordial approval.

9. The geological survey of India, under the superintendence of Dr. Oldham, is beginning to show considerable progress by the colored patches on the Index Map, and the systematic and methodical way in which the survey has been conducted in the face of great difficulties caused by the absence of reliable maps in many instances, is particularly satisfactory. The principal work during the season under review has consisted in the examination of regions in the Nerbudda Valley and Central India, the mapping of the Valley of the Upper Kistna by Mr. Foote, the exploration of the Berar and Chanda Coal-fields, and of the trap rocks in their vicinity, and the investigation of other coal districts, and of a promising lead-vein by Mr. Blanford. I am impressed with the zeal and devotion of the members of the geological survey, whose numbers, I regret to find, are annually thinned by disease and death. The value and importance of their results will be some compensation for the peculiarly severe and arduous nature of their duties, which, I am aware, is not at all too strongly stated by Dr. Oldham. Several copper-plates required for preparing the transfers for geological purposes, have already been despatched from England, and the maps will doubtless be issued without much further delay. I perceive that two quarter sheets are nearly ready.

10. I have perused these survey reports with much interest, they are records of a very satisfactory amount of work, well and zealously performed, and I have to request that an expression of my approval may be conveyed to Colonel Walker, Colonel Thuillier, and Dr. Oldham, of the way in which the duties have been performed by themselves and by the officers in their respective departments.

Report on the progress and results of borings for coal in the Godavari Valley near Dumagudem and Bhadrachalam, by W. T. Blanford, F. G. S., Deputy Superintendent, Geological Survey of India,—dated Calcutta, the 6th July 1871.

THE occurrence of fragments of shaly coal in the bed of the Godávari close to the spot where the Tál River joins it from the north, about twelve miles above Dúmagúdem, has been known for several years. It was noticed by Mr. Wall in his report of his journey to Kota near Sironcha in 1857, and the coal was by him supposed to be derived from the Tál River. An examination of the Tál for a considerable distance above its junction with the Godávari, however, having proved fruitless, Colonel Haig, the Superintending Engineer of the Godávari Navigation Works, asked me to examine the spot when I was marching down the valley in May 1867. I found that in the Tál, near its junction with the Godávari, the only rocks exposed belonged to the Tálchir group, whilst the Damúda shales and sandstones, which alone have been hitherto found in the Indian Peninsula to contain coal, appeared at the spot where the smaller stream joined the Godávari, and I suggested that the coal probably came from a seam buried beneath the sand of the river, and advised exploration by digging away the sand and closely examining the rocks. This was done by Mr. Vanstavern, Executive Engineer, and resulted in the discovery of coal in four places, all a little lower down the river than the

mouth of the Tál, so that the bed from which the fragments first found were derived has not yet been detected, but as a large quantity of silt and sand has been accumulated near the mouth of the Tál of late years, it is probably now covered to a considerable depth. The quality was inferior. Of the seams found, two, neither of them exceeding two feet in thickness, were detected close to the left bank of the river, opposite the village of Lingálá. The quality of the coal is rather inferior, and both seams thin out and disappear within a few yards; moreover, as the dip of the rocks at Lingálá is towards the river bed, or south-west, and the outcrop exactly parallel with the bank, it is clear that the beds, even if of good quality, could not be easily worked at this spot, as the whole of them within any reasonable depth must be beneath the bed of the river.

The third seam found crops out in the middle of the river bed; it is about 5 feet thick, and the quality appears better than in the other seams. The reef of sandstone resting on this coal can be fairly traced at intervals for some distance, and after running along the river for about a mile, it turns in towards the right or south-west bank. Here its course becomes obscure. Borings were put down by Mr. Vanstavern near the spot where the coal would probably crop out on the bank, but without success. Another thin seam, only 2 feet thick, has also been detected by Mr. Vanstavern on the right bank of the river. This, like the two first met with, thins out within a few yards in one direction.

I reached Dúmagúdem on the 25th December 1870, and learned from Colonel Haig that besides the coal at Lingálá near the mouth of the Tál, some had been reported farther down the river at a village named Madávaram below Bhadráchalam. This place is below the first barrier on the Godávari, and is consequently at all times in free communication by water with the coast, whilst Lingálá is above the first barrier, and although communication is now possible during the greater part of the year, it is not easy for laden boats except for a few months. At the spot where coal was said to have been found, I could detect nothing except some shaly dark-coloured sandstone, but the rocks around were unmistakeably Damúdas and there was every reason to hope for success in the search.

An examination of the ground showed that the Damúda rocks extend for a short distance on both banks of the river, but that sections are very few and imperfect. On the left bank which belongs to the Upper Godávari* Districts, there are scarcely any rocks visible except at the hills near Daorpali, and these are probably of a higher group, nearly the whole surface elsewhere being covered with alluvium. The beds appear to extend about six miles along the river from Gogubáká to Nándigúr, but not more than from a mile to a mile and-a-half from the bank. On the right (south) bank of the river they extend about five miles from Paláram to the bend below Madaváram, stretching for a mile and-a-half to two miles inland. Above Paláram there is a break occupied by metamorphic rocks for a mile and-a-half; above this, again, at Pundigúl the Damúdas re-appear and occur for about one and-a-half miles to a little above Amraváram, then they are covered apparently by the Kámthis, but the two groups here resemble each other so much in mineral character that their limits are difficult to define, especially as nearly the whole surface of the country is thickly covered with alluvial deposit. The Damúdas near Amraváram cannot be traced more than about a mile and-a-half from the river's banks, beyond this limit they are entirely overlapped by the Kámthis.

Along the right (or south) bank of the Godávari a tolerable section of the Damúdas is exposed, consisting of conglomerate, sandstone, shale and clay, but no coal. There are, however, many breaks in the section, and it is evident that an examination of these by boring would prove conclusively the presence or absence of any bed of coal extending over the whole field. Local beds, of course, might be found elsewhere, but their value must be comparatively small. It is also manifest that a thorough exploration can only be made south of the river, as to the north the beds are so much concealed that, except in a few spots, all borings must be put down at haphazard.

The general dip seen in the river's bank near Madaváram is to the westward, the rocks at the village being inclined at a high angle and much broken and disturbed; a short distance to the east down the river is an anticlinal, at the spot where a small stream enters the river. From this point eastwards to the bend of the river, a distance of less than a quarter of a mile, the rocks either have a low dip to the east or are horizontal, and the prevalence of conglomerate shows them to be in all probability near the base or limit of the formation.

It is evident that the anticlinal exposes the lowest rocks to be seen on the river bank, and that a boring at this spot must penetrate beds lower in the series than any exposed elsewhere. On the arrival of the boring tools, I arranged with Mr. Vanstavern for a borehole to be begun at this spot. This was commenced on January 17th and carried on until April 12th, up to which time 192 feet had been penetrated; the borehole was then stopped in consequence of the

* I do not know who bestowed this name on the Districts, but it is an absurd misnomer. The Upper Godavári can only be that portion of the river's course above its junction with the Pranhitá, if not higher still, where it traverses the Bombay Presidency. Sironcha at the upper extremity of these—"Upper Godávari Districts"—is 210 miles as the crow flies from the mouth of the river, and 400 miles from its source!

tools being required to prove the coal discovered on the opposite side of the river. The section passed through was—

		Ft.	In.
1.—	Brown sandstone	24	6
2.—	Shale and clay of various colours, mostly dark-grey	21	1
3.	Coal and shale mixed	0	6
	Dark-grey shale	0	7
	Ditto ditto with fragments of coal ...	0	8
	Ditto ditto	18	9
4.—	White sandstone conglomeratic in places, with thin beds of shale towards the base ...	53	9
5.—	Shale and clay with a little sandstone ...	37	2
6.—	Coal	0	8
	Black shale and coal	1	4
7.—	Dark-grey shale with a few fragments of coal in two places...	26	1
8.—	White sandstone	8	4
	Total ...	193	5

I next arranged for a series of fourteen borings to explore the portions of the section not exposed in the river banks to the west of Madaváram between that village and Damarcherla. These varied in depth from six to 200 feet, according to the extent of the breaks in the section, and the plan proposed was that all the smaller boreholes not exceeding 35 feet in depth, nine in number, should be made by jumpers with extra lengths of light rods to screw on. The remaining five boreholes alone would require the use of the heavier boring rods. In the ground opposite Madaváram no boreholes were put, because the breaks on the section are trifling, and the disturbance so great that there is reason to believe that a repetition of of beds takes place.

To the west of Damarcherla one or two additional boreholes might have been required, but a little beyond the village the beds turn up, dipping east, and then roll over again, and just beyond the small anticlinal, very unpromising conglomerates, perhaps belonging to a higher group, come in, in which there is no break of section which could conceal a coal seam. Two or three small jumper holes were put down to the east of Madaváram.

* * * * * *

It should be stated that the borings, so far as they had been carried out on the right bank, had shown the existence of sandstones and shales similar in every respect to those seen in the bank of the river, except that in two or three instances small fragments of coal proving the existence of very thin seams, probably not exceeding two or three inches in thickness, had been brought up by the borer. These little seams, although absolutely worthless in themselves, are of importance, as indicating that the mineral does occur in the beds, and that hopes may be entertained of larger seams being found.

The place selected for a boring on the north or British bank of the Godávari was on the right or west bank of a stream called the Ganar, rather less than half a mile from the Godávari, and about the same distance east of the village of Tátpali, at a spot where some brown sandstone, dipping to the south, is seen on the bank of the watercourse. A little more sandstone of the same kind is seen up the stream to the north, and then metamorphics crop out, the latter appearing about 500 yards north of the spot selected for boring. For some distance east and west all is alluvium. It was hoped that a borehole at the spot selected would afford a section of the lowest Damúda beds, lower than any passed through in the boring east of Madaváram. The borehole was commenced on the 12th April, and the section traversed was—

			Ft.	In.
(No. 1).		Soil and gravel	8	6
*1.—		Brown and yellow sandstone	25	6
2.		Shale, pale above, darker below	7	0
		Coal	3	0
		Do. mixed with shale	1	0
		Dark carbonaceous shale	5	0
		Coal	3	0
		Dark shale with 2 inches coal	6	0
3.—		White sandstone	27	0
			86	0

* The numbers 1, 2, 3, before the several beds in the sections, indicate those which are supposed to be representative of the same part of the series in each.

The higher 3 feet of coal appears to be of better quality than the lower; an analysis of the small fragments washed from the samples brought up from the borehole gave the following (average of three samples from three different levels):

Volatile	37·7
Carbon	42·7
Ash	19·6
	100·0

The volatile portion comprised 10·8 per cent. of water. This is by no means a good result, but still some use could be made of such coal, and it should be remembered that analyses of such samples as are obtained from borings are only approximations, although they are usually not far from the true composition.

When I heard of the discovery of coal I was about forty miles from the spot. I marched to it at once, but before I reached it, Mr. Heppel, who was carrying on the borings, had commenced a second borehole on some sandstone in the bed of the Ganár stream below No. 1 borehole at a distance from the first of 125 yards south-east by east. This (No. 2) gave the following remarkable section:

			Ft.	In.
(No. 2).	1.—Yellow and brown sandstone	...	28	0
	2. Shale, partly dark-grey, partly buff	...	1	6
	2. *Coal*	...	2	0
	2. Shale	...	2	2
	2. *Coal*	...	0	6
	2. Shale	...	0	6
	2. *Coal*	...	1	4
	2. Shale	...	1	4
	2. *Coal*	...	1	0
	2. Shale	...	1	2
	2. *Coal*	...	1	8
	2. Shale	...	1	2
	2. *Coal*	.	1	11
	2. Shale	...	0	10
	2. *Coal*	...	1	0
	2. Shale	...	2	8
	2. *Coal* (shaly)	...	1	9
	2. Shale	...	1	4
	2. *Coal*	...	0	8
	2. Black shale	...	5	0
	3.—White sandstone	...	3	2
			60	8

Altogether the combined bed of shale and coal measures 29 feet 6 inches, of which 11 feet 8 inches is coal, but the bands of coal and shale are intermixed in a way which would much increase the cost of working the seam. The astonishing change, however, in so short a distance as 125 yards from a bed 25 feet thick containing 7 feet of coal in two well defined seams exceeds anything usual even in India, amongst the very variable seams sometimes met with in the Barákár group, and this amount of change within so short a distance rendered it doubtful whether the seam could be traced to any distance.

It was now desirable, 1*st*, to ascertain the extent of the seam, and 2*nd*, its quality. For the extent two boreholes were put down, one to the east, the other to the west, at a distance of about one-third of a mile from No. 1 on the supposed strike of the coal seam. All the ground east and west for a considerable distance being completely covered by alluvium, the true strike could only be inferred from the line of outcrop of the metamorphic rocks to the northward. To the east the borehole (No. 4) was a complete failure. It was put down in an open plain north of the village of Ganára. It passed through 34 feet of earth and 18 feet of quicksand, in which no further progress could be made, as the sand filled the tube faster than it could be removed by the "pump" or mineral lifter. A second borehole 200 yards farther south (No. 5) was equally unsuccessful. After passing through 22 feet of soil and 24 feet of quicksand it also had to be abandoned. There was not time for more attempts in this direction.

The boring to the west (No. 3) was on higher ground, just south of the village of Tátpali. It gave—

			Ft.	In.
(No. 3.)		Soil and gravel	3	7
	1?	Sandstone, yellow, brown, and red	29	9
	2?	Pale colured shale	10	6
	2?	Red and yellow sandstone with some shale	7	0
	2?	Shale, pale and dark	13	0
	3?	White sandstone with a little shale and brown sandstone ...	24	8
			88	0

In my absence this borehole was stopped by Mr. Heppel, and another (No. 6) started 250 yards to the south-east. This was on somewhat lower ground, and as the beds dip south at a low angle the section is probably that of the same beds:

			Ft.	In.
(No. 6).		Soil	11	0
	1?	Brown sandstone	13	10
	2?	Buff shale	6	0
	2?	Red sandstone	2	0
	2?	Dark shale	6	0
	3?	White sandstone with darker bands	46	0
			84	10

These sections I am strongly inclined to believe are in the same beds as Nos. 1 and 2. We have the same general succession, brown and yellow sandstone above, then a thick bed of shale, and then white sandstone. I have recommended that one of the boreholes should be carried out to a greater depth on the possibility of these beds belonging to a higher horizon, but I cannot think this at all probable. The evidence afforded by these boreholes appears to indicate that the coal thins out and disappears to the westward within a short distance.

Meantime a locality for a small pit had been selected up the Ganár stream, 350 yards north-east of No. 1 borehole, at a spot where some yellow sandstone, just like that immediately over the coal, crops out in the bank of the nala, in the expectation that this would be close to the outcrop of the coal, and that a sinking of a few feet would produce abundance of coal to enable the quality to be fairly tested. A jumper hole, subsequently deepend by boring (No. 7) was put down in order to ascertain the presence of the coal. This gave—

			Ft.	In.
(No. 7).	1.—Yellow sandstone	...	29	6
	2. Buff shale	...	24	0
	2. Dark shale	...	6	0
	2. *Coal*	...	1	3
	2. Dark shale	...	26	3
			87	0

showing that the beds are nearly flat, and that a great increase of thickness in the shale has been accompanied by a diminution in the coal. A pit was therefore commenced close to No. 2, but when it was only 13 feet deep, the quantity of water met with retarded progress so much that it was considered advisable to commence another on the high ground 30 yards west of No. 1, as, although it would be a little deeper, it would not be equally liable to flooding, and might be used for the extraction of coal. A borehole has shown that the section is the same as at No. 1. This pit is now in progress.

Meantime one more boring (No. 8) was made only 200 yards west-by-north from No. 1. The section was—

			Ft.	In.
(No. 8).		Soil and gravel	10	5
	1.—	Coarse brown sandstone	4	0
	2.	Light coloured and buff shale ...	9	0
	2.	Red standstone	3	0
	2.	Light blue shale	2	9
	2.	Red sandy clay	14	3
	2.	Variegated clay	13	0
	2.	Dark shale	21	7
		Total ...	78	0

This boring was in progress when I had to leave at the end of May, and I have not yet received accounts of its completion. The enormous thickness of shale recalls the section in No. 7, and both sections may possibly be below the white sandstone which underlies the coal. But it is more probable that the shale represents the shale and coal found in the two first boreholes.

Lastly, as the absence of coal had been proved to the north-east and west, and no borings had been found practicable to the east, while the ground to the south appeared equally unfavorable for boring, except at a place on the bed in the Godávari where operations might at any moment, at the season now reached (June), have been stopped by a rise in the river, a borehole was recommended 200 yards south of No. 8 and south-west of No. 1. This (No. 9) has given the following section, sent to me by Mr. Vanstavern since my arrival in Calcutta—

		Ft.	In.
(No. 9.)	Soil, &c.	39	0
1.	—Brown Sandstone and conglomerate... ...	23	0
2.	Dark shale	3	0
	Ironstone	2	6
	Shale	2	0
	Coal	1	6
	Shale	2	0
	Coal	2	1
	Shale, carbonaceous	2	0
	Coal	1	6
	Shale, carbonaceous	1	6
	Coal	1	6
	Shale, carbonaceous	1	0
	Coal	1	0
	Shale, carbonaceous	2	0
	Coal	1	0
	Shale, carbonaceous	1	0
	Coal	2	0
	Shale	23	0
		112	7

The section is remarkably like that at No. 2. It decidedly strengthens the evidence in favor of all the boreholes having passed through the continuation of the same beds, for we have in this case a great thickness of shale as in Nos. 7 and 8, with the coal as in No. 2. The total thickness of coal as yet proved in this last borehole is 10 feet 7 inches.

To sum up the evidence: The presence of coal has been proved over a small area which contains probably about 25,000 tons, of which quantity it is as well not to assume that more than one-half can be profitably extracted, owing to the great admixture of shale. It is probable that the seam may be traced for some distance to the south, because the amount of coal, so far as is known, increases in that direction, but it is hardly likely that a seam which thins out and disappears within so short a distance as 200 yards can be depended upon for any long distance. The quality has not yet been accurately ascertained. If on cutting into the coal it is found to burn fairly, a considerable quantity may be extracted, far more than sufficient to well re-pay the expenditure incurred in boring; but, except in the improbable case of the coal continuing for a distance to the south and east, no permanent supply can be depended upon from this locality. The great admixture of shale and the variation in the seam will render it necessary to mine a large quantity of useless rock, and this will increase the cost of the coal, but in a country where no other supply exists, this alone should not prevent the coal being worked.

The locality is most favorable. The river is within half a mile when full, and about a mile during the dry season, and so soon as the coast canals are completed, it will be in constant water communication with Madras.

In conclusion, I would recommend that the remainder of this small tract of coal-bearing beds be thoroughly explored, as, even if no extensive seam of coal be found, a considerable quantity of useful fuel might be discovered, which would be available on an emergency. North of the river a borehole should be put down below the high bank at Rajgúmpa, at a spot where conglomerate is seen in the river bed, in order to test if the coal continues so far to the south-east. A boring might also be made where sandstone occurs in the stream north-east of Gaoriopeta, and another south of the large tank near Egerpeta, west of Tátpali, and one of the boreholes already sunk, for perference No. 1, should be continued until the metamorphics or Tálchirs are reached. There is little chance of good from any further exploration on the north bank. On the south or right side of the river, the series of borings planned west of Madaváram should be carried out. The small breaks in the section near Amraváram might be explored in the same manner, and especially a spot above the mouth

of the large stream which enters the Godávari just above the village, as small fragments of shale and coal are hereabouts scattered along the edge of the river, and may indicate a coal seam below the sandstone exposed at a place where there are some bushes beneath the bank.

If all endeavours to find a permanent coal-supply in this locality fail, an eventuality for which we must be prepared, the next chance is near Lingálá. Here I consider further exploration in British territory as almost hopeless, the Tálchirs must crop out everywhere below the mouth of the Tál close to the river bank, so that the Damúdas are confined, or nearly so, to the bed of the river and the country on the opposite side. Above the mouth of the Tál for some distance it is simply impossible to say what exists, for the whole country is covered with thick alluvium as far as Cherla, where the only rocks that are known to occur appear to me undoubtedly Kámthis, and all the Damúdas and Tálchirs are overlapped. The only plan by which any good can be done is an exploration of all the breaks in the section exposed above the top of the Tálchirs at Sangaram on the right bank of the river in the same manner as I have recommended near Madávaram. The dip varies from 10° to about 20°, and the depth to which the boring in each case must be sunk will be found by multiplying the length of the break by the tangent of the angle of dip.

I am under great obligation to Mr. Vanstavern for the very thorough manner in which he has aided me and for his readiness to carry out every suggestion I made. Mr. Heppel's services in charge of the boreholes were invaluable; it is mainly due to his thorough knowledge of boring and to his hard work, in an intensely hot season and despite many difficulties, that so much has been accomplished in a short time.

Temporary appointment of Dr. Day as Inspector General of Fisheries in India.

Extract from the Proceedings of the Government of India in the Department of Agriculture, Revenue, and Commerce,—No. 5, dated Simla, the 20th July 1871.

READ again—

The Resolution of the Government of India in the Public Works Department, Nos. 79-89 I, dated the 11th March 1869, ordering the employment of Surgeon F. Day, of the Madras Medical Service, on the special duty of making a comprehensive enquiry into the fish and fisheries of India.

Read also—

The despatch from the Secretary of State, No. 53, dated the 17th June 1869, approving of the Proceedings of the Government of India.

OBSERVATIONS.—The objects sought to be attained by the special employment of Dr. Day are thus set forth in the Resolution cited above:

"4. The Governor General in Council is of opinion that great scientific advantage will be secured by entrusting the examination of all the waters of India to a single naturalist so well able to deal with his subject as Dr. Day is believed to be. His Excellency in Council considers that this is the only way in which a precise knowledge of the facts relating to the inland and sea fisheries of India is likely to be gained, and even if no very great practical immediate good accrues from Dr. Day's enquiries, they will afford him opportunities of completing his scientific knowledge of the fish of India, in which it appears most proper that he should be aided as far as is possible.

"5. His Excellency in Council believes that the time has come when the great importance of obtaining exact information as to the natural capabilities of the land and water contained in this vast empire, and of stimulating the practical application of those capabilities to useful ends, is beginning to be more clearly and fully appreciated. All success in what are known as the useful arts of life depends on the skilful adaptation to our purposes and operations of the forces of nature. In no part of the earth is the energy of nature more great than in India, and no country affords a more hopeful field for extending its productive resources. The utilization to the utmost of the fisheries of the rivers and the coasts as sources of food to the population, the adoption of rules to prevent injurious over-fishing where that is found to occur, the removal of natural or artifical obstacles to the free reproduction of fish in the rivers, the regulation of the fishing in Government canals and other waters, the facilitating of the salting and curing of fish, and of the extraction of fish oil and isinglass, are, with other matters which need not be specially mentioned, of evident great public importance, and demand the attention of the Government as being likely, under suitable arrangements, to add largely to the resources both of the people and the State.

"6. The Governor General in Council will, therefore, request the Madras Government to place the services of Dr. Day at the temporary disposal of the Government of India to enable him to continue his enquiries on the comprehensive system which has been explained, and to submit a report on any matters relating to the utilization of the natural resources

of the rivers and seas of India, which seem to him to deserve the attention of the Government."

2. During the period of his special employment, which had commenced with special reference to the Madras fisheries before the orders quoted, Dr. Day has visited various parts of India and has submitted reports upon—

(1) the fresh-water fisheries of the Rivers Cauvery or Coleroon, Kistna, and Godavery;

(2) the fresh-water and sea fisheries of Orissa and the Midnapore District;

(3) the fresh-water and sea fisheries of British Burmah; and

(4) the fish-supply of Port Blair.

3. Dr. Day has also inspected the fisheries of the Punjab and the North-Western Provinces. The Governor General in Council understands that his report upon the former has been completed and will be submitted immediately, and that the report upon the North-Western Provinces will be submitted to the Local Government by the 15th of September. His Excellency in Council also understands that, by the commencement of the next cold weather, Dr. Day will have completed a description of the fresh-water fisheries of India, with remarks on fishes, forming a handy-book on the subject well adapted for the use of district officers throughout the country.

4. In order to carry into effect the programme sketched out in the orders of March 1869, the Governor General in Council considers that the following plan of operations should be adopted. During the approaching cold season, Dr. Day will examine the fisheries, sea and inland, of Sindh and the Bombay Presidency, and the south-western Districts of the Presidency of Madras, as well as the pearl banks of Tuticorin.

5. During the summer of 1872-73 Dr. Day will compile a general review of the sea and inland fisheries of British India (excluding only Assam and Bengal east of the Brahmaputra), based on his own observations and reports and on the information elicited by the questions circulated at his suggestion by the various Local Governments and Administrations to their executive subordinates. Dr. Day will also prepare an abstract of all laws and rules in force in the United Kingdom, and, as far as may be possible, in other countries also, for the protection and regulation of fisheries, which may seem to him susceptible of beneficial application to the whole or any part of British India and Burmah. He will, during this period, collect, in an easily accessible form, all information necessary to enable the Government of India to decide what legislative action is desirable and necessary for the preservation and improvement of Indian fisheries.

6. During the cold season of 1872-73 Dr. Day will examine and report upon the fisheries of Assam and Eastern Bengal generally, and, this done, Dr. Day will, for some little time at any rate, be fully employed with questions which will necessarily at first arise out of the practical enforcement of any law which the Government of India may find it necessary to enact for the regulation of fisheries, and any rules which the Local Governments and Administrations may consider advisable to promulgate with the sanction of the Government of India, to give effect to such law.

7. It is obvious that a considerable time will elapse before this programme is fully carried out, and Dr. Day can return to his substantive appointment, which is that of Medical Storekeeper at Madras. It is understood that the officer acting for Dr. Day draws the full pay of the appointment.

8. Considering these circumstances, and considering the great importance of retaining the services of an officer so specially qualified as Dr. Day in bringing to a close the labors now in progress, the Governor General in Council resolves to create the temporary appointment of Inspector General of Indian Fisheries, with a salary attached to the office of Rs. 1,500 per mensem, subordinate to this Department, and to appoint Dr. Day to the office.

9. Dr. Day's present salary is Rs. 1,150 per mensem, and his travelling allowances and contingent expenses average Rs. 200 per mensem, exclusive of passage money for sea voyages. In December next Dr. Day will attain the rank of Surgeon-Major, and he would then draw Rs. 1,390 per mensem, with, as above said, about Rs. 200 per mensem for travelling expenses and contingencies. Under the arrangements now proposed, Dr. Day will draw Rs. 1,500 *plus* a travelling allowance of Rs. 5 a day, exclusive (as above) of passage money for sea voyages. The extra expense, therefore, which will be entailed, subsequent to December 1871, by these arrangements, will be Rs. 60 per mensem, during the period for which this temporary appointment is maintained.

ORDER.—Ordered, that a copy of these remarks be forwarded to the Financial Department, with a request for sanction to the increased temporary charges.

(True Extract.)

(Signed) A. O. HUME,
Secretary to the Govt. of India.

Resolution by the Government of India, Financial Department,—No. 2434, dated Simla, the 4th August 1871.

READ—

Extract from the Proceedings of Government in the Department of Agriculture, Revenue, and Commerce, No. 5, dated the 20th July 1871, recommending the appointment, temporarily, subordinate to that Department, of Dr. Day as Inspector General of Indian Fisheries on Rs. 1,500 per mensem, *plus* a travelling allowance of Rs. 5 a day, exclusive of passage money for sea voyages.

RESOLUTION.—The recommendation is sanctioned, subject to confirmation by the Secretary of State, and to re-consideration of the charge in the summer of 1873-74.

ORDER.—Ordered, that the foregoing Resolution be communicated to the Department of Agriculture, Revenue, and Commerce, and the Comptroller General.

Cultivation of Carolina Rice in India.

PRÉCIS.

THE following is a précis of the reports received on the result of the experimental cultivation in 1868 of Carolina rice seed received from England, and of acclimatized seed received from Madras.

Bengal.—The seed reached the interior much too late. Failures attributed to this cause. The results of successful experiments are shown below. Experiment will be worth repeating if seed can be distributed not later than January next.

Cantonment of Dum-Dum near Calcutta.—Two and half seers of each kind, Carolina and acclimatized, were put into seed beds. All germinated freely, a small quantity only being carried away by birds. When about a foot high, the young plants were transplanted five or six in a bunch. The imported seed was transplanted into a piece of ground measuring 7 cottahs, and the acclimatized on a piece 8½ cottahs. The yield of paddy was,—imported, 1 maund 10 seers, acclimatized, 3 maunds, 7 seers;—of straw, imported, 13 puns; acclimatized, 2 kahuns and 2 puns. The striking difference in the yield of the acclimatized over the imported is attributed to the comparative pureness of the soil in which the former was transplanted, and to the inequalities in the two plots of ground, the acclimatized having the advantage over the other in this respect. Both sorts are unaffected by bad whether. After the gale on the 24th October 1868, the country crop was lying in heaps, but both imported and acclimatized remained unaffected.

The result of the paddy husked was as follows:

	Seers.	Chittacks.	
5 seers imported gave	3	9	of good rice.
5 „ acclimatized „	3	1½	„

The country produce at the utmost yields only 50 per cent. of rice.

Kamroop, in Assam.—One and-a-half seers sown in the Gowhatty Jail Garden yielded 27½ seers paddy. A larger yield would have resulted had the seed been sown earlier.

Howrah, in Burdwan.—Some acclimatized Carolina paddy sown by Mr. John Stalkartt in his own garden, grew remarkably well.

Cuttack.—The out-turn has varied considerably from 4 to 48 times the quantity of seed sown. Where great attention was paid it yielded well, and where little or no care was bestowed, it generally yielded fairly. On the whole the trial was a success, and the people in general are well pleased with the seed.

Pooree.—In one case all the seed failed. In a second, all germinated, but the plants died on being transplanted. In a third, only seven stalks came up. These results attributed to bad quality of seed.

Of seed given to the Reverend Mr. Miller, the yield from one seer was nine.

The Commissioner thinks that the result of these experiments is to show that with good seed the grain is of fair yield and good quality, suited to sarud lands.

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Lokardugga, in Chota Nagpore.—Results of Mr. Herzog's experiments.—One seer was sown in low land, and the same quantity of country seed was also sown near the same spot and on similar land. Neither germinated, owing probably to the lateness of the season.

On the same day another seer of Carolina was sown on high land covering an area of 357 square yards, and on a piece of similar land (370 square yards) the same quantity of country paddy was sown. The yield of the former was 8, and of the latter 31, seers.

Eight seers of Carolina were sown on high land and transplanted into about a beegah of ordinary dhan field. The yield was only 23 seers.

Results of Baboo Deo Narain's experiment.—Three seers were sown in a bed in July, and in about four days the whole had sprung up. They were eventually transplanted into one cottah of deep rice land. The soil was what is called "Balsoondee," or loam mixed with sand, which is considered the very best description of rice land in Palamow. The ear formed in October, ripened in November, and was cut in December. The yield was 24 pucka seers, which is considered a very large yield. It is considered in every way superior to the Native rice. The plant is a fine strong healthy one, with broad and very bright green leaves. It suffered a little from want of rain, but not to the same extent as the country sowings did. The grain does not appear to have deteriorated from acclimatization. The result of the experiment would have been more satisfactory had the sowing taken place in June. The Carolina seed is well adapted to the deep rice lands of the country, and is superior in many respects to the country grain.

Soonderbuns—The Carolina seed has been cultivated most successfully in Mr. O'Brien Smith's grant, and in one of the Port Canning Company's grants.

Several Native zemindars are willing to cultivate the seed experimentally in their estates.

North-Western Provinces.—The results of the experimental sowings in these Provinces are shown in the following statement. The Lieutenant-Governor observes that, in such a year of drought (1868), success could scarcely be looked for, but he hopes that the conditions of season will be more favorable this year for the experiments which are still to be continued:

Result of the experimental sowing of Carolina paddy in the North-Western Provinces in 1868.

Division.	District and Pergunnah.	By whom sown.	Quantity of seed sown and in how much land.	Weight of yield.	Remarks.
Meerut.	Moozuffernuggur ...	.....	.....	.....	The seed arrived too late in 1868, and has been carefully stored by the district officers for experiment in 1869.
	Allygurh ...	.....	.....	.....	
	Dehra Doon ...	.....	.....	.....	
	Saharunpore ...	.....	.....	.....	
Rohilcund.	Bijnour.				
	Moradabad.				
	Bareilly.				
	Shahjehanpore.				
	Turrai.				
Allahabad.	Banda.				
	Pergunnah Tirohan ...	.....	1 seer in 3 biswas of Oosur land manured and close to a tank.	.....	In about ten days the seed germinated and appeared above ground; the plants grew six inches high and then withered away.
	„ Ougassee ...	.....	¾ seer in 2 biswas of purwa land	.....	Germinated and appeared above ground in six days, was irrigated, grew 1½ feet and then dried up.
	„ Seondah ...	.....	½ seer in one biswa of Segon ...	.....	Germinated and appeared in eight days, was irrigated, grew 2 feet, came into ear and was then grazed at night by cattle.
	„ Kumassiee ...	.....	¾ seer in Segon land ...	.....	Did not germinate.
	„ Chiboo ...	.....	½ seer in 1¼ biswas of Dandi land in the vicinity of a village.	.....	Germinated and appeared in eight days and grew two feet after being irrigated, but gave no produce.
	„ Bidoosa ...	.....	½ seer in two villages in Gond land.	.....	Germinated and appeared in eight days, grew one foot and withered away.
					The Collector attributes the failure of the experiment in all the above cases (except Seondah) to the absence of rain from 17th June to 20th July 1868.
	Cawnpore ...	.....	.....	.....	Owing to the failure of the rains and the late arrival of the seed, the experiment was not tried.
	Humeerpore ...	.....	.....	.....	
	Futtehpore Sudder Station ...	.....	.....	.....	The plants grew up luxuriantly, but owing to the failure of rain most of the young plants perished. A few of those that survived came into ear, but produced no grain. This is attributed either to insufficient irrigation, or to an insect which attacked the ear.
	Allahabad ...	Mr. R. J. Carbery ...	.....	.....	The experiment proved a total failure. The seed was sown late and had 41 days drought to contend with, and, though irrigated, did not come on well. The plants had not been long transplanted when very heavy rain fell between the 13th and 18th September 1868, which laid them all under water, and they could not recover from this severe shock sufficiently to form seed.

Division.	District and Pergunnah.	By whom sown.	Quantity of seed sown and in how much land.	Weight of yield.	Remarks.
ALLAHABAD, *contd.*	Jounpore, village of Jugdeespore	Tehseldar ...	10 seers ...	....	Owing to absence of rain the plant did not thrive, and in September the excessive rain so retarded its growth that the experiment was attended with no result.
BENARES.	Goruckpore ...	Ahmd Ali Shah ...	1 seer ...	1 seer ...	The Collector states that the tehseldars report very unfavourably of the seed. He attributes this to no rain having fallen, and the seed consequently not germinating.
	Bustee ...	.....	.....	.....	Mr. Bridgman's report goes to show that Carolina rice is superior in produce to country rice, in the proportion of nearly 4 to 3; seed was also sown in the Bansee and Dumuriagunge Tehseels, both as Bhadaee and Ughanee with varying results. In Bansee that produced as dhan dried up, and that sown as jurhun yielded only its own seed. In Domuriagunge it totally failed. In Bustee that sown as the earlier rice crop yielded eight-fold, while that sown as the latter rice crop yielded only three-fold.
	Azimgurh ...	Mr. Dunne ...	2 seers in 3 biswas ...	24 seers ...	Mr. Dunne thinks the seed was sown too late, as he observed that 25 or 30 per cent. of the ears had no grain in them when the paddy was cut. The Collector adds that the year was a most unfavourable one for rice cultivation.
	Benares ...	Ghous Khan, Karinda of the Zemindar of Mouzah Murhwa, Pergunnah Sheopore.	$7\frac{3}{4}$ seers in 1 biswa and afterwards transplanted into 8 biswas.	1 maund 30 seers paddy and 5 maunds straw.	A crop from country seed sown in a similar quantity of land and close to the land upon which the Carolina crop was grown, gave an yield of 1 maund 28 seers of paddy and 6 maunds of straw. The Collector states that this year's experiment cannot be accepted as a fair one, as the seed was sown late and the fall of rain was much below the average.
	Mirzapore ...	.....	.....	.....	The Collectors' report that the experiment was a complete failure owing to want of rain.
	Ghazeepore ...	.....	.....	.....	

W. C. PLOWDEN,
Secretary.

Punjab.—The seed arrived too late for sowing last year, but it was kept for trial this season in the Districts of Kangra, Hoshiarpoor, Mooltan, Peshawur, Umritsur, and Lahore, as the best adapted for the purpose.

Oudh.—The seed was distributed on the 10th July 1868. Each Deputy Commissioner received about 13 seers. The following are the results of the trials in each District:

Oonao, Baraich, Kheree, Rai Bareilly.—All experiments entirely failed.

Lucknow.—In some places the seed did not germinate. In others the plants did not come to perfection.

Barahunkee.—Seeds germinated in all cases, but only in one case were two seers of produce collected. In all others the plants dried up.

Fyzabad.—In Dostpore some seed was produced and kept for further experiments. In the Jail Garden a small quantity of seed was also obtained.

Gondah.—Produce next to nothing owing to dry weather. The ordinary rice crop of the District was not so bad

Seetapore.—The seeds germinated in all cases, but plants dried up though duly irrigated.

Hurdui.—In Sandeela only a small quantity of paddy was produced. It was turned into rice which was pronounced to be "of very fine quality."

Pertabgurh.—No report received.

Sultanpore.—Thirteen seers were sown in a bed and afterwards transplanted and carefully irrigated. The produce was 4 pucca maunds: a sample of the seed produced was declared to be "good and full." All the transplanted *country* paddy failed entirely.

On these reports Dr. Bonavia, Superintendent, Department of Science, Oudh, remarks that the seed arrived in first rate condition as it germinated in many instances; but that sufficient care was not devoted to the experiment, though he also admits that the seed arrived somewhat late, and that the season was unfavorable for trying experiments with paddy. He thinks that the result of the experiment in Sultanpore proves what intelligence and care could effect, notwithstanding the disadvantages above-mentioned.

Central Provinces.—The seed was received in May and distributed at once. It was received in good time, but the season was a very unfavorable one owing to the absence of the usual rains. The results of the experiments in these Provinces are shown below:

Raepore.—The experiment was tried by Mr. Duncan Sinclair, Assistant Settlement Officer.

On the 11th June, 107 Rupees' weight of seed was sown. It sprung up on the 15th very vigorously, and required no water till 18th, when it was watered five times from the well and was, on 23rd July after a heavy shower, transplanted into ground, $7\frac{1}{2}$ poles area, which was prepared for the purpose with a large proportion of black loam. Two plants were put together at distances of 5 inches apart. No rain fell up to 2nd August, hence well water was given. The plants wore a healthy appearance and took root. Subsequent to this a heavy shower fell, and the plants made rapid progress in their growth. Very little rain during September and none in October: irrigation was resorted to largely.

The produce of the $7\frac{1}{2}$ poles of land amounted to 40 seers of Rs. 80 or 30-fold. The state of the season considered, this result was extraordinary. The produce of the best qualities of Native seed is 15 and 20-fold in good soil with an average fall of rain; that of the inferior 20 and 25-fold, an acre of land is sown by the Natives with Rs. 3,600 weight of seed; this gives per pole Rs. $22\frac{1}{2}$ weight, whereas Rs. 15 weight of Carolina sufficed for the same quantity of land. A saving of 15 seers per acre would be effected by the use of the Carolina seed.

The Carolina seed throws forth a strong stem and a number of offshoots (as many as 11 healthy ones were noticed), each of which produce an ear as long as the main stem. The rice is coarse, but it cooks well, *i. e.*, has a good appearance after boiling. It has no scent, which is considered a great disqualification by the Natives. The country rice is considered by them superior in quality. Many malgoozars have begged for seed nevertheless.

Nagpore.—In the Ramtek Tehseel the experiment failed entirely, as the seed was sown in unirrigated lands and dried up.

In the Omrair Tehseel the seed germinated well, and, the unfavorable season considered, yielded a fair crop. The long and stiff root interferes with the operation of transplanting. The crop is difficult to thresh out.

Chanda.—Various places were chosen in the rice-growing tracts of the Wurdah and the Weiwgunga Valleys and of the eastern table land; but the season was unfavorable. The general failure of rain, which so destroyed the indigenous kinds, told with equal severity on the Carolina rice, and in only one instance did the experiment have fair play. In this instance the return was nearly 22-fold on land which, when planted with the indigenous varieties,

usually gave but 10-fold. From the trials made with Carolina seed, the following conclusions are arrived at:

1*st.*—It requires less water than the native kinds.
2*nd.*—It benefits by liberal manuring.
3*rd.*—It ripens earlier than the native kinds.
4*th.*—Gives a larger return of paddy.
5*th.*—And the paddy yields a larger proportion of cleaned rice.
6*th.*—Its straw is coarser than the native kinds, and is less liked as fodder by cattle.
7*th.*—In flavor the rice is inferior to that of the better native sorts.
8*th.*—It is fitted to supersede the coarser kinds of native rice.

Bhundara.—The results were not very favorable.

British Burmah.—The results of the experiments made in this Province are noted below. The Chief Commissioner observes that "the results are, on the whole, not so satisfactory as could have been wished, but it has been proved that with proper care the paddy will grow well in this Province." The cyclone of 13th November 1868 marred the experiment in a great measure.

Arracan Division, Jail Garden at Akyab.—Ten seers of seed were sown on 7th July, and a portion transplanted in due course. The soil was all sand, slightly manured. The transplanted plot did not do so well as the others. The whole of the ground was estimated to contain about 50 or 60 baskets prior to the storm of 13th November. The plants grew to about 3 feet. The seed should have been sown at least a month earlier. The plants had to be irrigated to a great extent owing to the poor nature of the soil. During the early part of the season, the young plants were stolen to a very considerable extent. The out-turn was 17 baskets of 12 seers each.

Akyab District.—The largest out-turn in this District was in the Shin Gyan Circle, where one cultivator obtained 50 baskets from 18 seers of seed. The paddy was sown in August and reaped in November, but not transplanted. The soil was better manured than is usually the case. It was alluvial: situation not very low.

In Tha Mee Hla Circle also 21 baskets were obtained from 9½ seers of seed. The soil used was the usual alluvial soil. The yield was considered very superior.

In most of the other cases, very poor returns were obtained owing to the seed having been sown in low-land and to the lateness of the season and consequent heavy rains. The cyclone also did much injury.

The Deputy Commissioner thinks that the best time for sowing is September. The grain is described as larger than the country rice, and the straw much thicker. With the Arracanese for these qualities it does not find much favor, but the Bengallees do not object to them. The yield of the country paddy is frequently 130 and 140 baskets the acre.

Dr. Mountjoy, Civil Surgeon of Akyab, reports to the following effect:

The paddy will grow well and yield plentifully in Akyab. It requires rather dry ground; cannot bear much water at its roots. In a field some of this paddy appeared to be dying, yet it was restored to health by cutting through the bund and letting off the water. It ripens quickly within three months. It ought to be transplanted to increase the yield. It is strong on the stalk. The stalks are much more numerous than from native grain. It should be sown early in the season. Nacrensee takes seven months to ripen, Carolina only three; therefore an acre of land would produce two crops of Carolina in the same time it takes to produce one crop of Nacrensee. Such a result might be obtained in Arracan (where the rains are long continued) without the aid of irrigation. In treading out Carolina is more adherent than the indigenous grains.

Pegu Division.—The experiment tried by the Society has been, on the whole, very satisfactory. The seed (one basket = 1 bushel) was sown broadcast on 26th July, transplanted 20th August, and reaped 25th November and 10th December. Soil, bluish clay with an admixture of sand. The out-turn was 23 baskets of cleaned paddy. The seed thus obtained has in no way deteriorated.

Garden of the Agri-Horticultural Society, Rangoon.

The results of the sowings in the several Districts of this Division are shown in the following Table:

District.	Seed sown.		Out-turn.	
	Bushels.	Pyees.	Bushels.	Pyees.
Rangoon	13	11	25	8
Bassein	14	2½	40	2½
Myanoung	13	11½	57	9
Prome	11	6½	66	11
Tounghoo	6	5½	72	9

The results of the sowing in the Rangoon District were not favorable owing to the seed having been sown too early and been inundated; but the cultivators generally approve of it, and regard it as similar to the Kouk Yin paddy of Burmah.

The experiment was also unsuccessful in the Bassein District owing to want of proper care and attention on the part of the cultivators. The people, however, condemned the seed as unprofitable, because the yielding capabilities of the grain were proved to be far inferior to that of the grain of the country.

Myanoung.—The failure of the experiment in the Myanoung District was owing not to any defect in the seed itself, nor to the soil, nor to the mode of cultivation, but to one or other of the following causes: (1) inundation, (2) scorching of the seed planted on high land owing to want of rain early in the season, and (3) too much water in the fields.

The cultivators say that the Carolina does not bear transplanting well owing to its long tenacious roots; that the paddy is very hard and adheres closely to the stalk; that the cattle tread it out with difficulty, and that the rice is very hard, but the straw is long and fine, and the cattle eat it with avidity. It is also strong and better able to resist rain and wind than the native paddy. With a little care in cultivation, it will succeed very well and give a greater return than most kinds of the native paddy: the seed is large, and its hardness would prove a valuable quality for purposes of export.

Prome.—The result of the experiment in the Prome District has been a comparative success. While July is regarded as rather early for sowing in Rangoon, it is considered late for Prome and Thayetmyo. The out-turn of one planting (at Poungday) was 40 times the amount sown. Of other paddy the out-turn is generally 20 to 24 times the amount sown. In the Sub-Division of Thayetmyo, a great deal of the seed sown was destroyed in some cases from want of water, and in others from inundation.

On the whole, the paddy is favorably thought of; the chief objections to it are thickness of stalk and difficulty of detaching grain, owing to which a great deal more trouble is incurred in transplanting than with the ordinary paddy.

Tounghoo.—The experiment is described by the Deputy Commissioner as being only "slightly successful." Yet the out-turn is proportionately the largest in Tounghoo District of any. The mode of cultivation adopted was exactly similar to that of the indigenous paddy. Different kinds of soil were also tested. The paddy sown on high ground gave the greatest yield. The transplanted paddy also gave the best out-turn. The yield in black loam soil was the lowest. The people are very sanguine that the next experiment will be much more satisfactory.

Tenasserim Division.—The out-turn was bad owing to excessive rain-fall and severe inundations during the rains. The seed was planted in the Districts of Amherst, Tavoy, and Mergui in July, and in the Shewgyeen District in August and September. With only three or four exceptions it was sown broadcast. The best results were obtained in the Shewgyeen and Amherst Districts, but particularly in the former, where 48 to 50 times the quantity sown were produced. The superiority both of the yield and of the grain is acknowledged. It grows to maturity a month earlier than the Burman paddy, taking only three months to be ready for reaping. The straw is thicker and coarser, the ears longer and fuller, and three times as heavy as the ordinary indigenous paddy. The roots strike deeper into the ground, thereby offering more resistance to high winds and heavy rains. The seed is unsuited for cultivation in low inundated lands. It thrives better on high land, where there is not more than two or three inches of water during the rains, or say a foot above the ordinary level of the paddy plains. Referring to some paddy which had been planted "in the best paddy land," the Assistant Commissioner of Thatone (Martaban Sub-Division, Amherst District) writes—"The plants were the finest paddy plants I think I have ever seen, and the Karens were in raptures about it." And, again, referring to some paddy sown on high ground, *i. e.*, about a foot above the ordinary level of the plain near the base of the hills, he observes—"This has succeeded splendidly." Indeed, I think from the little I have seen that such a situation suits this paddy better than our ordinary paddy land in this sub-division.

The great tenaciousness of the Carolina paddy to its husk, rendering threshing difficult, is looked upon as a serious objection. Another objection is that, unlike the indigenous rice, the Carolina is hard to boil, and is not agglutinous. This, in the opinion of "an intelligent Tounghoo cultivator," renders it unfit for human consumption; but is also admitted that "the taste is good, and it is more satisfying than our rice."

The report from the Mergui District was as follows: "Carolina paddy was sown and reaped at the same time with indigenous paddy. The plants were weaker than the country paddy plants. The ear was shorter and contained less grain than country paddy. The indigenous produced five or six shoots for every grain, while the Carolina paddy only produced two or three shoots, and the produce of grain less by 75 per cent. The roots of the plants were not so deeply imbedded as the roots of the indigenous paddy, hence quality of the Carolina paddy was inferior to that of the country paddy. Every cultivator has condemned the paddy. The paddy was grown in ordinary rice land."

Précis of the results of the cultivation of Carolina Paddy in India in 1869 *and* 1870.

Revenue Proceedings, 16th October 1869, Nos. 45 to 54.

* For a printed *precis* of these, see K. W. of the Proceedings cited.

In forwarding to the Secretary of State the reports* furnished by the local authorities in the Bengal Presidency on the results of the experimental cultivation of Carolina rice in this country during 1868, the Government of India, in its despatch No. 67, dated 18th October 1869, remarked that, owing to the late receipt of seed from England and the unfavorable nature of the season, the experiment could hardly be considered to have had fair play. It was therefore determined to wait the result of the further trials which were being made with acclimatized seed, as also the result of the trials that might be made with the 30 barrels of Carolina paddy seed which the Home Government had been asked to supply. This consignment was, on its receipt, made over to the Government of Bengal, for which it was intended; and that Government made the necessary distribution of the same. The Lieutenant-Governor was at the same time requested to make a trial of the seed with sewage water in the experimental farm at the Salt Water Lakes A small quantity of the seed was also sent direct to the Chairman of the Justices of the Peace for the Town of Calcutta for the same purpose.

Revenue despatch from Secretary of State, No. 96, dated 14th December 1869.

Revenue Proceedings, 29th January 1870, Nos. 14 to 17.

From Bengal Government, No. 1807, dated 23rd June 1870.

Public Proceedings, 26th March 1870, No. 135.

Reports from the authorities concerned as to the further cultivation of Carolina rice have now been received, and the following is a summary thereof:

NORTH-WESTERN PROVINCES.

No. 298A, dated 2nd April 1870.

Dehra Doon.
Cawapore.
Humeerpore.
Pergunnahs Ougasee, Seonda, and Budonsa, in the Banda District.
Goruckpore.
Azimghur.

During 1869 the experiment was a failure from some cause or other, at the places noted on the margin, in the North-Western Provinces.

In Pergunnah Tirohan, in the District of Banda, one seer of seed gave an outturn of five seers. It was said that all the seeds did not germinate, and the crop was not irrigated; while half a seer of country seed, sown on similar land and under similar circumstances, gave an out-turn of ten seers.

Benares.—Ten biswas of land sown with Carolina paddy seed gave an out-turn of 1 maund 20 seers, while another ten biswas sown in juxtaposition with country seed produced 3 maunds 20 seers. The straw of the two kinds was equal. The flavour was reported to be good; but the leaves of the plants, owing to their being more tender, were more injured by birds and insects, than was the case with the country paddy.

Mozuffernuggur.—Thirteen seers of Carolina seed were sown by one Lalla Buldeo Suhoy. After seven waterings the seedlings were transplanted into eight bighas of first class manured land, and there watered seven times again. The stalk reached 3 feet in height. The produce was 31 maunds 27 seers. In comparison with the sorts of *moonjee* grain in the neighbourhood, there was neither loss nor gain, the outturn being the same on an average. The Board of Revenue authorized the Collector to purchase the seed from Buldeo Suhoy for distribution to other landholders for experiment in 1870.

Saharunpur.—The Collector reported that, while the experiment failed in certain quarters, an intelligent agriculturist, named Kour Sen, of Hareti, a village about 3½ miles from Saharunpur, succeeded beyond expectation. The outturn of his cultivation was 36 maunds an acre, against the average outturn of 15 maunds per acre, of the best kind of Native rice grown in first class irrigated lands. Mr. Webster said that he saw the crop standing on the 1st or 2nd of October, and was struck with the great contrast it presented to the Native rice growing round it. He continued that "it was more than double in length and thickness of stalk, and the heads appeared to be many times larger than those of the Native plant, which had suffered considerably from the late heavy rains and high winds, some of it being beaten down flat to the ground, and a good deal of it injured more or less, while the Carolina rice plants stood up firm and strong, and, as the zemindar remarked, seemed to flourish the more the more it rained." His report was concluded with the remarks cited below:

"What Kour Sen has done however, sufficiently proves the great superiority of the Carolina rice to the Native plant, in vigour, amount of produce, and capability of resisting the effects of storms and heavy rains; its straw is also so far superior to that of the common rice that, when known, it will be sought after for thatching and other purposes, while the common kind is useless, or at best forms part of the fodder for buffaloe.

"The rice as food is considered to be inferior to the best Native produce, and would sell somewhat cheaper in the market, but the extraordinary amount of its yield renders it, in my opinion, a grain the cultivation of which should be promoted and encouraged as much as possible in the rice-producing tracts of this country."

No. 698A, dated 19th May 1870.

The Government of the North-Western Provinces also submitted the following report regarding the experimental cultivation of Carolina rice in the Rohilkund Division :

Bareilly.—The seed was distributed for experimental sowing to the Civil Surgeon and to the Tehsildars of Phillibheet and Buheree.

The trial made by Dr. Corbyn failed, as the seeds did not germinate owing to their being old and moth-eaten.

At *Phillibheet*, 1¾ seers of seed were sown in 9⅓ biswas of land in the government garden. All the seeds germinated ; the plants were watered once and grew to a height of 1⅓ yards. The ears were splendid and very full. The yield was 25 seers in husk and 14 seers in a cleaned state. This was about the average produce of coarse rices in the locality ; and the Tehsildar thought that, if the garden had been less shady, the yield would have been greater.

At *Buheree* the result was not so successful. The seed was made over to two zemindars for cultivation,—half seer to one and ten chittacks to the other ; and the outturn was five seers and four seers respectively. The produce was inferior to the seed sown. The latter was of a red color, while the former was of a whitish color, and was lighter in weight to the extent of about 20 per cent.

Terai Pergunnahs.—Twelve seers of seed were sown in 2 bighas of land in Burakhera, Pergunnah Guderpoor, and the outturn was 3 maunds 8 seers. The result was said to be satisfactory, although the seed was not sufficient for the area sown, and the field was much injured by the late fall of rain. Country rices of a similar description gave a much larger outturn, but under similar circumstances they would not have given the same as the Carolina rice did. It was considered to be superior in quality to the finest Terai rice.

In the Moradabad District, the result was not very satisfactory, Surjoonuggur being the only village in which 1¼ seers of seed sown in half a bigha of land yielded seven seers of rice.

In Shajehanpoor the trial was a total failure.

CENTRAL PROVINCES.
No. 1631—126, dated 21st June 1870.

The experiments were tried in four Districts,—Nagpore, Chunda, Bhundara, and Raepore.

Nagpore.—In the opinion of the Deputy Commissioner the Carolina rice was inferior in flavour to the best country kinds, and the outturn was not more than that of the latter. No specific result of the cultivation was reported.

Bhundara.—The Deputy Commissioner, without showing any specific result, reported that the large size of the grain and the productive nature of the yield, when properly cultivated under favorable circumstances, rendered the Carolina rice a very desirable grain for cultivation. "The stalks of the crops are so stiff and strong that, even when they attain a good height, they stand upright with the ears on them, and ordinarily high winds do not shake off the grain from the ears into the moist earth below."

Chanda.—In this District, the experiments did not result very favorably. The yield of the Carolina rice was not more than that of the country grain, if so much ; and the Natives unanimously pronounced it insipid. But the superiority of the former over the latter was said to consist in the peculiarities noticed by the Deputy Commissioner of Bhundara.

Raepore.—Mr. Sinclair, who was in charge of the rice cultivation in this District, tried the experiments in two fields in two different ways. In the one, the cultivation was carried on in the same method as obtained in America ; and in the other, in the style prevalent in Chattisgarh. In the first field, the average height attained by the paddy was five feet, the stalks being as thick as one-fifth of an inch. Each plant had on an average twelve shoots, and each shoot bore an ear. The ears averaged in length six inches, and the yield was 590 seers of paddy. The second field sown with three seers of seed produced 48 seers of rice. The height of the paddy in this field was said to be "3½ feet, and the shoots no more than six or seven per seed ; the straw was inferior, and the ears about five inches in length, and not half as prolific as the transplanted beds."

From the above results Mr. Sinclair was convinced that to yield a good crop, Carolina seed required the precautions

1*st*.—The soil must be of loose clay and sand mixed.
2*nd*.—It requires manuring.
3*rd*.—It must be clear of weeds when the plants are put down.
4*th*.—Transplantation is the most satisfactory process.
5*th*.—The seed for transplantation must not be thrown in too thick, or the plants get long and weak, and take a long time after transplantation to acquire vigour.
6*th*.—The plants must be put down eight inches apart.
7*th*.—After transplanting there must not be too much water in the field; in fact, it must be kept as a mere puddle until the plants erect themselves, and then water may be let on or retained in the field sufficiently to cover all but two inches of the tufts; and after the plants are one foot high, and well in the soil, the more water the better.
8*th*.—Low-lying grounds are the best.

BRITISH BURMAH.
No. 238—13, dated 23rd July 1870.

marginally specified. The Chief Commissioner remarked that "altogether the inference to be drawn from the results of this year's experiments would appear to be that, under the ordinary treatment which the Carolina rice may be expected to receive at the hands of the people of this country, the outturn will not exceed that of the country seed,—though, by a careful system of transplanting, a well regulated use of irrigation and a proper system of manure, the yield of the foreign seed may be increased. The foreign plant is hardier than the indigenous one, and yields more straw; but the grain would not appear as yet to be appreciated by the Natives of these Provinces who are very nice and discriminating in their tastes."

From the reports received from this Province, it would appear that, in all the Districts in the Arracan and Pegu Divisions, the experimental cultivation of Carolina rice failed, excepting in the solitary instance of the Meaday Township, Thayetmyo District, in which the seed given to a cultivator, named Moung Pho Tay, yielded 200 per cent., and that entrusted to another, named Moung Tsa, gave a return of five bushels against $\frac{1}{16}$th of a bushel of seed sown. The Assistant Commissioner, Thayetmyo, observed: "The ear is much longer, and yields more than the ordinary paddy; but it is more difficult to remove the grain from the ear, and the cattle take a longer time in treading it out."

PUNJAB.
No. 101, dated 24th February 1871.

The Government of the Punjab submitted a letter from the Financial Commissioner stating that reports on the experimental cultivation of Carolina rice during 1869 were received from fourteen Districts including Chamba, and that three more Districts did not furnish any return. The greatest success attendant upon the trials was realized in Chamba, where the rice was found popular and more seed was wanted for cultivation. The experiments in the Agri-Horticultural Society's Gardens at Lahore were also successful as to the yield, but the quality of the rice was not liked by Natives. In eleven Districts the experiment was a failure owing, in most cases, to the seed having been sown too late.

In 1870 five barrels of the seed were distributed to the several authorities in the Punjab for cultivation; and the result

was that the trials were successful in Chamba, Kangra, and Gúrdaspúr. In Lahore there appeared to be a success, but the quantity of seed sown was so small that it was thought unwise to draw any conclusion.

The Superintendent of Chamba reported that the seed sown in wet ground which was much irrigated failed, but that sown on high ground and moderately watered produced a crop about one-fourth in excess of an average crop of country rice. It was added that the plant had a more substantial and stronger stalk and was less liable to be beaten down by heavy rain or wind than the ordinary rice. The Superintendent also remarked that, when the grain was separated from the husk in the usual country way by pounding it in a mortar, the grain was much bruised and injured, "so much so as to be greatly deteriorated in value."

In Kangra the seed was sown in irrigated *dofasli* land of the best description in the Palum Valley, and the amount of the uncleaned crop was 31 times as much as the seed sown. It was said that the crop would have been larger if the seed had not been received too late to allow of transplanting the rice.

In Gúrdaspúr 24 seers of seed produced 24 maunds of uncleaned rice. The grain was a little larger than the country rice.

The experiments failed in Hushiarpúr, Syalkote, Peshawur, and Huzara.

The Financial Commissioner remarked that even in 1870 the seed was in most cases received too late to allow of the necessary operation of transplanting. At the same time it was clear to him from the reports from Chamba and Kangra that even without transplantation the seed succeeded well. Looking at the results of the two years, 1869 and 1870, that officer concluded that the yield of the grain was considerable, and that the crop ripened earlier than other kinds of rice, but that the grain was coarse and did not command a high price. The Financial Commissioner therefore considered that it was unsuited for a country where rice was not the staple food for the poorer classes, where it was grown for sale and not for consumption.

MR. S. HOGG.
No. 155, dated 10th February 1871.

The Chairman of the Justices of the Peace for the Town of Calcutta reported that the experimental trial at the Salt

Water Lakes was an accidental failure, but promised to make a further trial next season (1871). He was told to submit his report on its termination.

Home Department, No. 87, dated 22nd February 1871.

BENGAL.

No. 1124, dated 17th April 1871.

The Government of Bengal forwarded a letter from the Officiating Superintendent, Botanical Gardens, from which it would appear that the experimental cultivation of Carolina rice in the reclaimed lands at the Salt Water Lakes had also failed owing to the rise of water. The trials made at the Botanical Gardens met with a similar result.

Bengal No. 2141, dated 21st July 1871.

The Board of Revenue submitted an abstract of the reports received from District Officers and others in the Lower Provinces respecting the results of the experiments made in cultivating the Carolina paddy in this country. This abstract is sub-divided into three parts—

1*st*. *Successful.*—The places where the results were very satisfactory and encouraging are noted in the margin. In several instances it is stated that the Carolina paddy, as cultivated experimentally, was superior to the country kind.

Debroogurh.	Durrung.
Lutkimpore.	Cachar.
Seebsaugor.	24-Pergunnahs.
Lohardugga.	Tipperah.
Burdwan.	Singhboom.
Midnapore.	Moorshedabad.
Pooree.	Soondurbunds.
Jessore.	

Besides Goruckpore in the North-Western Provinces, and Port Blair, respecting which reports were furnished by the Agri-Horticultural Society of India.

2*nd*. *Doubtful.*—The failures in the experiments* under this head are attributable, in most instances, to special causes, such as excessive rains, inundation, drought, destruction of crops by insects, birds, &c., want of care, and the different processes adopted in the experimental cultivation. In a few instances only the failures are said to have been due specially to the unsuitableness of the soil.

* Made in 61 places.

3*rd*. *Unsuccessful.*—In this portion of the abstract are shown those cases of trials which met with total failure from causes quite unaccountable. The aggregate of these unsuccessful attempts is 13.

Considering the disadvantages under which a new cultivation laboured, the Lieutenant-Governor thought that the report furnished by the Board of Revenue, as noticed above, was, on the whole, much in favor of the experiment. He observed that, in reality, in certain places and conditions, the Carolina paddy yielded decidedly more than the country paddy, but it laboured under the disadvantage that the grain was not understood, and was more difficult to husk, and consequently there was no easy market for it. He was at the same time of opinion that these latter disadvantages would diminish in proportion as the cultivation increased.

The Lieutenant-Governor thought that efforts should be made to continue the experiment, but apprehended great difficulties in doing so in Bengal, as the zemindars had no *neez* cultivation, *i. e.*, no farms, and were not readily made amenable to influence, while ryots could not be expected to risk experiments. His Honor remarked—"The chief advantage in Bengal is the presence of so many European gentlemen in the interior, but they do not cultivate rice, or any ordinary staple on a large scale, and only grow samples by way of experiment." It was added that "he very much wishes that Government could make agricultural experiments as has been done in Madras, but the zemindars are so entirely separated from agricultural interests, and consequently the work of improvement is likely to be so difficult, that he abstains from suggesting it, till he can give more attention to the subject than he has hitherto done."

OUDH.

No. 2675, dated 3rd June 1871.

Lucknow District.	
Oonao	"
Burabankee	"
Fyzabad	"
Kerasur Thannah, in Barraitch District.	
Sitapur District.	
Mohumdee, in Kheree District.	
Hurdui.	
Roy Bareilly.	
Sultanpur (partial success).	
Partabgarh	"

In this Province the experiments failed at the places noted on the margin from a variety of causes.

At *Nowparah*, in the Barraitch District, from one *kutcha* bigha three maunds twenty seers were produced, and at Bhingha a bigha produced four maunds.

In *Gola* and *Lackheempore*, Kheree District, the out-turn was good, and, in fact, above the average of the indigenous crops.

In *Sultanpur* two seers sown, yielded sixteen seers in one instance only.

In *Tehseel Puttee*, Pertabghur District, sixteen seers were gathered out of four seers sown.

Dr. Cameron, in submitting the above reports, remarked that the directions given for the cultivation of Carolina paddy had not apparently in any case been attended to, and that probably owing to neglect of the necessary precautions, almost universal failure was the result. On his being asked for the reason for the conclusion he arrived at, he said that one of the directions was to manure the soil well, and in no case was it stated that this was done. Thereupon the Chief Commissioner has proposed to call upon the Deputy Commis-

sioners to report whether the land selected for the experiment was manured or not. This report has been awaited by the Government of India.

CEYLON.

In the *Ceylon Government Gazette* of the 3rd June was published a very interesting report from the Múdaliyár of the Síyané Koralé on the subject of the cultivation of the Carolina paddy. At the beginning of 1868 the Múdaliyár received 1lb weight of the seed from the Government Agent for the Western Province for the purpose of extending its cultivation in his district. The result and the manner in which he proceeded with the charge entrusted to him will be seen from the following extract from his report:

"* * * Accordingly, without loss of time, I got a field prepared and sowed with the said paddy in the beginning of February the same year (1868); and although the drought was very great in that year, I got the field watered from a well, and the paddy which sprung up very well was reaped in May, but I only got a very poor return of two pounds weight of paddy.

"Upon careful examination of the crop, as well as the paddy, I came to the conclusion that this paddy required acclimatization. The paddy was, however, carefully prepared and preserved as seed paddy for the next harvest; and I took the advantage of the Maha harvest to cultivate this paddy jointly with the Maha cultivation, for which purpose I set apart a bed in a tract of paddy field cultivated for the Maha harvest, for the cultivation of Carolina paddy, prepared the same, and sowed therein the above two pounds weight of Carolina seed paddy on the 2nd October 1868. Three months after the Maha paddy was sown, and when the Maha paddy was being reaped, the Carolina paddy was also fit for reaping; and when reaped in January 1869, the crop amounted to three pecks of paddy; and plants having subsequently sprung out from the stalks left after the first reaping, also produced a second crop amounting to a quarter of a bushel, making in all one bushel, which one bushel was carefully prepared and sown for the next ensuing Maha harvest on the 6th of November 1869, and produced the encouraging result of 20 bushels at the beginning of February 1870.

"Out of these 20 bushels, I sowed one bushel for the next ensuing Yala harvest on the 1st of June in my field at Pasyala, and eight bushels in my field at Wanduramulla in October 1870, and the remainder I gratuitously distributed to 21 cultivators of my District to extend the cultivation of this paddy in their fields also.

"The paddy of my field at Pasyala that I had sown on the 1st June 1870 was reaped at the latter end of October 1870, which gave me 24 bushels of Carolina paddy, and I distributed the same also gratuitously to 30 cultivators of my district, to be sown for the ensuing Mutes harvest.

"The eight bushels that I had sown in my field at Wanduramulla in October 1870 for the last Maha harvest was reaped at the beginning of February last, and the crop amounted to 160 bushels. Out of this I have given 25 bushels of Carolina seed paddy to Government, to be sent to the Government Agent of the Southern Province, and the rest I have distributed among 40 of the best cultivators of my district, to be sown for the present Yala harvest, and return me the seed paddy when they reap their crops; and they are at present in the nursery and will be sown on the 1st of June next.

"I have experienced that, for the successful cultivation of this paddy, it is necessary to have soft and continually moist ground. In fields near the banks of rivers or streams, or at the foot of hills, no artificial manuring is necessary, but they only require a good weeding when the plants are about a foot high.

"If this paddy is to be sown on a poor sandy soil, it ought to be manured either with bone dust, cow-manure, ashes or 'keppetiya' leaves (which are to be had in abundance in almost all jungles) buried in the fields. But transplanting in either soil would yield crops of double the quantity expected.

"Out of my fields, without weeding or manuring, it gave me twenty-fold, and by weeding, bone-dust manuring, and transplanting, sixty-fold.

"This paddy ought to be sown very sparsely, so that the trees may not be closer than six inches from each other, as they shoot out a far larger number of young plants than the ordinary paddy, more particularly in the best soil; and if sown closer than desired, the paddy trees grow thin, fall off, and the whole crop get spoilt.

"The excellence of this paddy will commence to manifest itself weekly, after the sixth week, until they are reaped, which should not be endeavoured to be done, as with the ordinary paddy, at once as young plants of different growth are springing up from every paddy bush. They ought to be reaped, as the paddy ripen from time to time.

"The stumps of these paddy trees are larger and stronger; the leaves broader, thicker, rough, and more dark green than ordinary paddy; the trees never fall down; they grow to the height of four and five feet; and, when they commence to blossom, they blossom at once; and when they commence to ripen, they ripen at once, which is not the case with the paddy of this country; and they give different crops at different times, as the plants shoot out at different ages; and this paddy answers for all the harvests in Síyané Koralé, namely, the Maha, Yala, and Mutes harvests.

"According to the paddy cultivation in the Síyané Koralé, if this paddy is to be sown for the Maha harvest, they should be sown between the 1st and 5th October; if for the Yala harvest, on the 1st and 10th of June; if for the Mutes harvest, on any early day in December, as the high water permits. If they are sown early for the Mutes harvest, they can be reaped before the rising of the river.

"This paddy stands water and all other effects of the climate better than all the qualities of the native paddy.

"I found great difficulty in inducing the Natives to try and cultivate this paddy, and they were very much disinclined to do so, until they had seen the result of my cultivation, after which they flocked in for handfuls of seed paddy from me, and I think that two years hence there will be no other paddy cultivation in Síyané Koralé but that of Carolina paddy. This paddy is gradually improving in size after each cultivation of it, and they are the largest paddy now in existence in Ceylon, and it looks more like wheat than paddy, the husk being thinner, and the paddy heavier than the paddy of this country, and when its rice is boiled for the table, it is much more white, gluey, and more heavy food than the Ceylon rice."

MADRAS.

From the annual reports on the management of the Government Farm Estate at Sydapet, the following would appear to be the results of the Carolina paddy cultivation in that farm:—

1868-69.—In this year, a few plots of ground were sown; but as the ground was ill-suited for paddy cultivation, the crop failed.

1869-70.—The experiment was most successfully carried on, and the result was highly satisfactory this year. It was proved by experience that the foreign paddy required no special culture, and that the best Native system of growing rice was also the best system for the cultivation of Carolina paddy. A plot of land containing 225 square yards was planted on the 8th October with the plants produced by half a measure of seed; the crop was reaped on 8th February, and, after drying, yielded 336 pounds of straw and 70 measures or 160 pounds of paddy. This result

would be 7,183 pounds of straw, and 1,505 measures or 3,441 pounds of rice per acre; assuming 20 measures equal to an English bushel, the yield was about 75 bushels per acre.

1870-71.—The cultivation of Carolina paddy was carried on in the Native manner, and the result was that—

1,830	square yards of land	produced	950 lbs.	of grain, or 26	bushels per acre
2,027	„ „	„	960 „	„ or 46	„
2,650	„ „	„	1,120 „	„ or 40	„
A smal plot		„	215 „	„ or 23	„

Madras Revenue Proceedings for April 1871, Nos. 180-1.

The Superintendent of the Sydapet Farm made certain observations on the experimental cultivation of Carolina seeds in the Coimbatoor District. It was deduced that the land sown with Carolina paddy yielded 1,434 pounds of grain per acre, while that sown with country paddy gave an out-turn of 1,469 lbs. per acre. In discussing the relative merits of these two kinds of rice, Mr. Robertson admitted the superiority of the former over the latter in respect of the strength of its straw, and remarked that "the weather which would level a "field of country paddy, and thus discolor "and spoil their grain, would pass harm-"lessly over a crop of Carolina paddy."

Nos. 64-73.

Extract from the Proceedings of the Government of India in the Department of Agriculture, Revenue, and Commerce,—dated Simla, the 7th August 1871.

[AGRICULTURE AND HORTICULTURE.]

READ the under-mentioned correspondence on the subject of the cultivation of Carolina rice in India:

Revenue despatch to the Secretary of State, No. 67, dated 18th October 1869.
Revenue despatch from the Secretary of State, No. 96, dated 14th December 1869.
Revenue despatch from the Secretary of State, No. 98, dated 21st December 1869.
Letter to Bengal Government, No. 52, dated 22nd January 1870.
Letter to Bengal Government, No. 63, dated 25th January 1870.
Letter from Honorary Secretary to the Government Experimental Farm, Madras, dated 25th February 1870.
Letter to Government of Bengal, No. 155, dated 17th March 1870.
Letter to Mr. Stuart Hogg, No. 1729, dated 25th March 1870.
Letter from Government of the North-Western Provinces, No. 298A, dated 2nd April 1870.
Letter to local Governments and Administrations, Nos. 256-60, dated 4th May 1870.

Letter from Government of the North-Western Provinces, No. 698A, dated 19th May 1870.
Letter from Chief Commissioner of Oudh, No. 3062, dated 22nd June 1870.
Letter from Government of Bengal, No. 1807, dated 23rd June 1870.
Letter from Chief Commissioner of the Central Provinces, No. 1631—126, dated 21st June 1870.
Letter from Chief Commissioner of British Burmah, No. 238—13, dated 23rd July 1870.
Letter from Mr. S. Hogg, No. 155, dated 10th February 1871.
Letter to Mr. S. Hogg, No. 87, dated 22nd February 1871.
Letter from Government of the Punjab, No. 101, dated 24th February 1871.
Letter from Government of Bengal, No. 1124, dated 17th April 1871.
Letter from Chief Commissioner of Oudh, No. 2675, dated 3rd June 1871.
Office Memorandum from Home Department, No. 3078, dated 22nd June 1871.
Letter from Government of Bengal, No. 2141, dated 21st July 1871.

RESOLUTION.

EXPERIMENTS in the culture of this exotic staple have been carried on since 1868, and the papers read above contain the results of the experiments made in 1868-1869 and 1870 in the Bengal Presidency and certain districts in Madras and Ceylon. Although the Government of India is not yet in a position to decide authoritatively as to the exact merits of the Carolina paddy, as compared with the several indigenous varieties, and although the opinions of different officers and the reports of the results attained in different localities are very discordant, there appears to be generally a balance in favor of the superior utility of the American plant.

The advantages which this exotic possesses over the indigenous varieties may be briefly summed up as follows:

I.—The Carolina paddy plant is more hardy, as it is less easily injured by gales and heavy rains, which entirely prostrate the Indian kinds. It requires a less amount of water than the Indian plant; it suffers less from drought and also (according to some authorities) from floods.

II.—The produce of this species of rice is much greater than that of the country kinds.

(*a.*)—In respect of its yield in grain, it gives a much larger gross weight of rice in the husk, and, the husk being thinner, it yields a larger proportion of clean rice to rice in husk, and, when ripe, it does not drop its seed in consequence of a little rain or wind as the Indian varieties generally do.

(*b.*)—The straw is longer and stronger than that of Indian rice, and can be utilized for thatching and other purposes for which the Indian straw is almost useless. In Burmah it is said to be greedily devoured by cattle.

III.—It ripens earlier and in a much shorter time than the indigenous varieties, so that in Burmah and in some places on the Continent of India it would be possible to obtain two crops of Carolina for one of the common Indian rice.

IV.—When properly attended to, it appears to improve rather than deteriorate by cultivation in India.

2. On the other hand the following are the disadvantages of the Carolina rice :

I.—Its quality (according at any rate to Indian ideas) is somewhat inferior. It has little flavor and scarcely any scent. It is believed to contain somewhat less nutriment, is less liked by Native consumers, and commands at present a lower price amongst them.

II.—The grain is much more difficult to thresh out.

III.—The straw is coarser, and, in some localities, is said to be less liked by cattle.

3. Considering how little justice has on the whole been done to the cultivation of this foreign staple, and that it is quite a recent introduction into this country, the Governor General in Council thinks it may safely be concluded that the balance of advantages is in its favor, and that it is expedient to continue the trial. His Excellency in Council accordingly directs that the local Governments and Administrations in the Bengal Presidency be requested to state as early as possible what quantity of seed they will require and by what time it should reach them. Application will then be made to the Secretary of State for a supply of seed of the finest quality.

4. His Excellency in Council also directs that, besides the supply it is intended to obtain, instructions be issued to district officers to utilize all existing seed and to take particular care that all seed produced by the cultivation of the supply to be procured through the Secretary of State, is carefully preserved for use in 1873.

5. The Governor General in Council attaches great importance to the experimental cultivation of this rice, and trusts that the local Governments and Administrations will do their utmost to make this trial a really satisfactory and conclusive one,—not necessarily attempting it in all districts, but carefully selecting the most favorable localities and the most careful officers, and making such arrangements as will ensure the receipt from them of full and correct accounts of the results obtained. His Excellency in Council considers that for this purpose it would be advisable for the local Governments and Administrations at once to decide where and under which district officers the cultivation should be carried on, so that no delay whatever might occur in the distribution of the seed when it arrives.

6. The Secretary of State will be requested to procure and send out as early as possible by the Suez Canal 50 barrels of seed of the first and best quality, with an intimation that, if necessary, a further quantity will be indented for on receipt of replies from the several local Governments to the enquiry made in paragraph 3.

ORDERED, that a copy of the foregoing Resolution be forwarded to the Local Governments and Administrations named in the margin for information and guidance.

Bengal.	Central Provinces.
N. W. Provinces.	British Burmah.
Punjab.	Coorg.
Oudh.	Hyderabad Assigned Districts.

Ordered also, that a copy of this Resolution be forwarded to the Governments of Madras and Bombay, with a request that the Government of India be favored with a full report of the results obtained in those Presidencies, and of the conclusions arrived at in regard to the comparative merits of the Carolina rice and the indigenous varieties.

Ordered further, that this Resolution and a précis of the correspondence be published in the Supplement to the *Gazette of India*.

(True Extract.)

(Signed) A. O. HUME,
Secretary to the Govt. of India.

No. 31 of 1871.

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, AUGUST 19, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

Non-Subscribers to the GAZETTE *may receive the* SUPPLEMENT *separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.*

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA *is required by Law, of which it has been customary to publish in the* CALCUTTA GAZETTE, *will be included in the* SUPPLEMENT. *For such Orders and Notifications the body of the* GAZETTE *must be looked to.*

GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Tuesday, the 8th August 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding.*
His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.
The Hon'ble John Strachey.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major-General the Hon'ble H. W. Norman, C. B.
The Hon'ble F. R. Cockerell.
The Hon'ble R. E. Egerton.

PENSIONS' BILL.

THE Hon'ble MR. COCKERELL moved that the Report of the Select Committee on the Bill to consolidate and amend the law relating to Pensions be taken into consideration. He said that the only amendments of any importance proposed by

the Select Committee were in regard to (1st) the reference of claims to pensions or grants of money or land-revenue under certain circumstances to the Civil Courts for adjudication, and (2nd) the extension of the protection from sequestration now afforded to pensions, to charitable or compassionate allowances.

The fundamental principle of the Bill, which in this respect was, as regards its application to the whole of British India, with the exception of a portion of the Bombay Presidency, a mere recapitulation of the existing law, was that as the bestowal of pensions, money-grants or assignments of land-revenue was a pure act of grace on the part of the ruling power, so the latter justly and necessarily reserved to itself absolute freedom of action in regard to the disposal of all claims respecting such allowances; hence no power could be left to the Civil Courts to act adversely to the interests or policy of the Government in such matters.

But it might frequently happen that, when the liability of the Government to pay any pension or grant of money was admitted, and there were no political considerations affecting the determination of the order of succession to such pensions or grant, the Government might wish to leave the question of succession or participation to be determined in accordance with the ordinary law of inheritance as administered by the Courts.

To meet such cases, a new section (six) had been introduced, the legal effect of which was that the Civil Courts must accept and exercise jurisdiction in regard to cases of this kind referred to them by competent authority, but could make no decree by which the admitted liability of Government could in any way be increased or adversely affected. The decree of the Court would be binding in such cases as between A and B, the rival claimants, but could not operate as regards the Government, except with the consent of the latter.

The expediency of extending the protection accorded to pensions to compassionate allowances was too obvious to admit of question. The considerations which led to the exemption from attachment by civil process of the pensions of discharged public servants applied with equal force to the case of pensions or portions of pensions continued to the family of a deceased pensioner, or a compassionate allowance granted to the family of a person who had died in the public service.

The only other alteration which called for any special remark was the provision contained in section nine of the amended Bill. It was intended to meet the probably numerous cases of grantees who, under the conditions of their grants, were left to recover the revenue assigned to them from the occupiers of the land, of which the revenue was so assigned, in the same way as the proprietor of land recovered the rent of such land from his tenants.

It was necessary to declare that the want of power in the Civil Courts to entertain suits relating to an assignment of land-revenue, and the provision of the Bill in regard to the mode of payment of grants, should not apply to such cases. It might be said, indeed in one quarter at least it had been implied, that the subject of this Bill was one which might reasonably have been left to be dealt with by local legislation as regards the provinces in which there were local Councils.

The extension of the existing law to that part of the Bombay Presidency in which it was not at present in force, which was the prominent feature of the Bill, could not have been effected by the local legislature, inasmuch as it involved an interference with the jurisdiction of the High Court.

As the action of this Council was required to provide for that necessary extension, the opportunity had been taken for a general consolidation of the very numerous and diffuse enactments on the subject of pensions, and a comparison of the enacting matter of the Bill with its repealing schedule would show what a very considerable saving of statutory substance had been accomplished by that operation.

Nor was the course which had been adopted in regard to this measure in any way calculated to prejudice the public convenience, for the practical effect of sections five, eight and fourteen of the amended Bill was to transfer future legislation on all matters of detail connected with the subject of pensionary allowances from the ordinary legislature to the local executive, and he apprehended that this was by far the most convenient and satisfactory manner of dealing with such matters.

The Motion was put and agreed to.

The Hon'ble MR. ELLIS moved that, in section eleven, instead of the words "No pension granted by Government in consideration of past services," the words "No pension granted or continued by Government on political considerations or on account of past services," be inserted. He said that the original intention had been to extend the provisions of section eleven to this class of pensions, but that it had unintentionally been overlooked in Committee. He believed that the policy of the Government, with reference to this subject, might be seriously interfered with, if pensions granted on political grounds were not exempted from the ordinary process of the Courts. He also proposed the introduction of the words "or continued," so as to provide for cases in which pensions had been "continued," though not in the first instance granted by Government.

The Motion was put and agreed to.

The Hon'ble MR. COCKERELL then moved that the Bill as amended be passed.

The Motion was put and agreed to.

OATHS AND DECLARATIONS AMENDMENT BILL.

The Hon'ble MR. STEPHEN presented the Report of the Select Committee on the Bill to amend Act No. V of 1840 (concerning the Oaths and Declarations of Hindoos and Mahometans).

The Council adjourned to Tuesday, the 15th August 1871.

SIMLA;
The 8th August 1871.

H. S. CUNNINGHAM,
Offg. Secy. to the Council of the Govr. Genl. for making Laws and Regulations.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Rain-fall and Agricultural Prospects in the North-Western Provinces and in Mysore and Coorg.

From C. A. ELLIOTT, Esq., Officiating Secretary to the Government, North-Western Provinces, to the Secretary to the Government of India in the Department of Agriculture, Revenue, and Commerce,—No. 1220 A dated Nynee Tal, the 3rd August 1871.

IN continuation of my letter No. 1178A., dated 26th July, I am directed to forward, for the information of His Excellency the Governor General in Council, an Abstract Statement of the average rain-fall in the Districts of the North-Western Provinces during the week ending 14th July 1871, and of the total fall from the 1st June 1871.

2. I am to add that so far the agricultural accounts from all parts of the Province are favorable.

Abstract Statement of average rain-fall in the Districts of the North-Western Provinces during the week ending the 14th July, and total fall from 1st June 1871.

DISTRICTS.	Week ending 14th July.	Total from 1st June 1871.	REMARKS.
Kumaon	5·6	23·9	
Gurhwal	4·0	15·5	
Dehra Doon	5·9	31·8	
Seharunpore	2·3	13·5	
Bijnour	4·8	18·5	
Moradabad	6·3	17·5	
Terai	4·8	25·0	
Bareilly	6·6	20·1	
Budaon	6·8	13·5	
Shahjehanpore	7·9	20·2	
Moozuffernuggur ...	3·4	8·5	
Meerut	4·6	11·2	
Boolundshuhur	3·2	8·1	
Allygurh	2·4	7·8	
Etah	6·4	15·1	
Furruckabad	4·3	9·5	
Muttra	4·0	10·5	
Agra	2·1	8·1	
Mynpoory	4·2	14·2	
Etawah	2·9	10·7	
Cawnpore	.....	.....	
Jaloun	2·1	9·9	
Jhansie	3·2	11·1	
Lullutpore	1·6	14·3	
Humeerpore	1·7	9·4	
Futtehpore	3·2	15·7	
Banda	2·3	14·1	
Allahabad	5·1	19·1	
Mirzapore	4·9	18·1	
Benares	5·0	16·3	
Jounpore	7·4	14·9	
Ghazeepore	4·0	13·4	
Azimgurh	7·5	15·1	
Goruckpore	5·8	19·7	
Bustee	5·3	13·5	

Statement showing the rain-fall, the state of the weather, and the prospect of the crops in Mysore and Coorg for the week ending the 15th July 1871.

PROVINCE.	Rain-fall.	State of the weather.	Prospect of the crops.	REMARKS.
Mysore ...	Rain-fall registered at Bangalore 3 inches 90 cents.; at Shimoga, in the Nagar Division, 2 inches 15 cents. Rain to a less extent than the above has fallen in the other Districts.	South-west monsoon with showers of rain prevailed during the week.	As stated in last week's report, the prospects of the crops have been improved by the change of weather; rain having fallen generally in the Province. In some Districts, *viz.*, Mysore, Hassan, Chituldroog, and Toomkoor, the crops are suffering from want of sufficient rain.	
Coorg ...	Rain-fall gauged at Mercara, 7 inches 30 cents.	South-west monsoon in full force.	Prospect of crops reported to be generally good.	

MYSORE CHIEF COMMR.'S OFFICE,
BANGALORE;
The 25th July 1871.

T. G. CLARKE, *Captain,*
Officiating Secretary.

Statement showing the rain-fall, the state of the weather, and the prospect of the crops in Mysore and Coorg for the week ending 22nd July 1871.

PROVINCE.	Rain-fall.	State of the weather.	Prospect of the crops.	REMARKS.
Mysore ...	At Bangalore 30 cents. In the Province, the rain-fall registered varies from 35 cents. to 1¼ inches.	South-west monsoon prevailed with strong winds, and occasional showers.	The reports received from the several Districts are on the whole very favorable. The standing crops are generally doing well, though, in some localities, the want of abundant rain is felt.	
Coorg ...	At Mercara, 15 inches 94 cents.	South-west monsoon with heavy rain.	The prospects of the crops are good.	

MYSORE CHIEF COMMR.'S OFFICE,
BANGALORE;
The 29th July 1871.

T. G. CLARKE, *Captain,*
Officiating Secretary.

Statement showing rain-fall, state of weather, and prospect of crops in the Districts under the Central India Agency, from 1st June to 15th July 1871.

District and date.	Rain-fall.	Direction of Wind.	State of weather.	Prospect of crops.
Indore.				
June 1st to July 15th ..	7 inches 94° ...	Prevailing wind, South-West.	Showery with heavy rain latter part of June. 1st to 15th July fair with clouds.	Satisfactory.
Schore.				
June 1st to July 15th ..	17 inches 40° ...	Prevailing wind, South-West.	Ditto.	Ditto.

State and condition of Indian Immigrants in Grenada during 1870.

From Her Majesty's Secretary of State for India, to His Excellency the Right Hon'ble the Governor General of India in Council,—No. 48 (Public), dated India Office, London, the 15th June 1871.

IN continuation of paragraph 2 of my despatch of the 26th of October last, No. 99, I forward herewith a copy of a despatch* addressed by the Lieutenant-Governor of Grenada, to the Governor-in-Chief, Barbadoes, covering the report† of the Immigration Agent at Grenada on the state and condition of the Indian immigrants in that colony during the year 1870. I also transmit a copy of a letter‡ from the Emigration Board, to the Colonial Office, on the subject.

* Dated 23rd February 1871, No. 19.

† Dated 10th February 1871, with two enclosures.

‡ Dated 18th April 1871.

2. Your Excellency in Council will perceive that the Agent's report is upon the whole, satisfactory.

3. In reply to objections raised by that officer to the new Act of the Grenada Legislature No. 399, the Lieutenant-Governor of the Colony points out, it will be observed in the first place, that no complaints have reached him of immigrants being unable to obtain employment; and secondly, that Section 93 of the Act in question fully secures the right of the colies to back passage, which Mr. Munro had imagined was no longer provided for.

4. I would draw the attention of your Lordship in Council to the suggestion of the Immigration Agent, concurred in by the Emigration Board in this country, that the coolies should, on sanitary grounds, receive rations in lieu of wages for the first two or three months after arrival in the colony. It appears that the practice has been adopted with successful results in Mauritius, British Guiana, Trinidad, and Jamaica.

From the Lieutenant-Governor of Grenada, to His Excellency the Governor-in-Chief, Barbadoes,—No. 13—19, dated Grenada, the 23rd February 1871.

I HAVE the honor to transmit to your Excellency a letter* from the Immigration Agent, enclosing his report† on the state and condition of the Indian immigrants in this colony for the year 1870.

* Enclosure No. 1, dated 10th February 1871

† Immigration Report, year 1870.

2. With reference to Mr. Munro's observations on the Immigration Act, 1869, contained in the 7th paragraph of his letter, I have to report as follows:

1*st.*—No complaints have reached me of any immigrant being unable to obtain employment. It would appear, however, from the fact that the planters evince no desire to re-indenture their laborers, that they do not place that sufficient value upon their services which is relied upon by the Government to aid in securing for the immigrants a liberal and kind treatment.

2*nd.*—For the simplification of the law, the provisions of Act 256 were expressly omitted. Instead of the annual payment of a small sum into the hands of the Immigration Agent, to be applied towards the payment of the back passage, it was thought desirable to pay to the cooly a bounty provided by the Act, in order to induce the entering into a long contract from time to time, leaving the back passage to be provided out of the Immigration Fund.

3*rd.*—The repeal of Act 390 does not involve any breach of faith as suggested by the Immigration Agent, inasmuch as clause 93 fully secures the right to back passage of the coolies alluded to.

4. With reference to the 3rd and 4th paragraphs of his report, I have to remark as follows:

1*st.*—That the treatment of unindentured and unlocated sick immigrants is provided for by annual grant to the Colony Hospital under the Immigration Act. Free admissions should be confined to that class alone. If such immigrants, located on estates, and for whose treatment such estates are liable, have been admitted into the Colony Hospital without payment of the expenses, it has resulted from the inattention of the Immigration Agent. To prevent any such recurrence I have instructed him to make quarterly instead of half-yearly inspections of the estates on which immigrants are located.

2*nd.*—There is no ground for the regret expressed by the Immigration Agent, as, under the interpretation clause, the penalty is recoverable from the proprietor or manager, or other person having the direction of the estate.

3*rd.*—The state and condition of the immigrants appear, on the whole, satisfactory.

From G. G. MUNRO, ESQ., Immigration Agent, Grenada, to the Colonial Secretary,—dated Grenada, the 10th February 1871.

IN furnishing you with the annexed returns of the Indian immigrants who were in this colony on the 31st December last, I beg to furnish at the same time a report on the sanitary condition of the immigrants after personal inspections of them in the month of January of the present year.

2. *Their numerical strength.*—From the semi-annual returns furnished this Department by employers, I find that there were on estates, located in agricultural service, at the close of the year, 841 male and 345 female, 421 boys and girls, and 107 infant Indian immigrants, making a total of 1,714 souls.

A few bountied Indians, who have emancipated themselves from plantation labour, and have rented lands on the Upper Pearls Estate, residing there, are not included in this return.

3. *The increase in* 1870.—There were no importations of immigrants in 1870, and the natural increase among them was 40 Indian boys and 25 girls, making a total of 65 births.

4. *The decrease in* 1870.—There were two departures only from the colony in 1870, to the neighbouring Island, Trinidad; and the sanitary report hereto attached exhibits a mortality of 40 Indians, equal to 2·33 per cent., a death-rate somewhat less than that of the preceding year, but which should, I consider, be much lower in a colony so salubrious as this is known to be. The deaths were chiefly among children.

5. *Crimes and offences.*—From the returns furnished by the Justices in the several Districts, under the 69th Section of the Act, there would appear to have been only 20 convictions and imprisonments of Indians during the past year, namely, nine for assaults, one for burglary, one for cane-stealing, one for cutting and wounding, three for petty thefts, one for obtaining goods under a false pretence, one vagrancy, and three for breach of contract.

There were two commitments for arson and burglary; but the parties were acquitted after trial—a calendar by no means heavy for a heathen population who receive neither moral nor religious instruction.

From the paucity of convictions for breach of contract, I apprehend that those cases in which defendants pay money into Court on conviction are not included in those returns. Unless all convictions involving loss of time to employers are furnished me, the provisions contained in the 64th Section of the Act cannot be fully carried out.

6. *The coolies imported in* 1866.—The immigrants imported by the ship *Countess of Ripon*, on the 24th January 1866, completed their industrial service of five years on 23rd January of the present year. Certificates will be issued to those entitled thereto.

Of the 260 Indians landed here, there are now in the colony 84 men, 50 women, 29 boys, 36 girls, and 18 infants; in all 217 souls.

The natural increase among them during those five years was 32 boys and girls, and the decrease by deaths 67,—nearly one-fourth of the number landed. This mortality occurred chiefly among the male adults during the first two years of residence, and is, I think, sufficiently convincing that the new comers require special care and attention for some months after arrival here. With the view to ameliorate the privations which the new comers must feel by a sudden change of diet, I would respectfully suggest that in future the surplus stores of the importing vessel should be purchased, and divided among employers at the cost price, for the use of the immigrants, in quantities to last two or three months, and to be issued to the immigrants in lieu of wages, by which time they would get accustomed to our Native products.

The mortality above-mentioned occurred on the Mount Alexander, Lafortune, Mornefurdue, Plains, Samaritan, Simon, and Telescope Estates chiefly. Nine immigrants were removed to Demerara from the first-named estate.

7. *The new Immigration Act,* 1869.—Since the passing of the new law on the 15th October 1869, no immigrants have been re-indentured under its provisions, and at the present moment there is not an Indian immigrant under an annual contract to labour. This is an anomaly which could not have been contemplated.

The new law provides but one re-indenture, namely, after the expiration of the immigrants' first five years of industrial service in the Colony; whereupon if he accepts a bounty of £10, he may re-indenture for other five years to an employer. Employers have not as yet availed themselves of the Act, and contracts therefore, under which the immigrants at present serve, are verbal or monthly ones, which may be determined at any time by the misconduct of either party. A contract which can be terminated by six days' notice cannot be otherwise than unsuited to the planter, who requires steady and constant labour.

The new law repealed Act No. 256, under which employers contributed largely to the immigration fund for the back passages of Indians, and as the provisions contained in the second clause have not been re-enacted, these contributions, which amounted in the average to £700 per annum, have ceased. Employers do not, I believe, object to pay $7 or even $10 per annum to secure the services of the certificated Indians; but objection has been expressed, not by employers only, but by the immigrants themselves to the long indenture of five years. The latter prefer the liberty to change their employer in case they are not well treated, to resorting to complaint or legal measures.

I am of opinion, therefore, that an annual re-indenture of the immigrant during the last five years of his residence, although entailing additional work on this department, would be far more satisfactory to the employer and the employed. The new law also repealed Act No. 390, under which the immigrants per *Fullwood* and *Galawar* accepted bounties with a stipulation therein contained, that the right to the back passage would be secured to them at the expiration of the additional term of five years. Although I do not think that many of the bountied Indians will avail themselves of it, yet, as a few of them may wish to return home on the expiration of the additional term, the repeal bears an aspect of breach of faith, and I think it my duty to advert to it here, as it may have been unintentional.

8. *Time-expiring Indians.*—Next year the coolies imported by the ships *Accrington*, 9th January 1862; *Athletoe*, 25th March 1862; and *Ganges*, 29th May 1862, will have completed ten years of industrial residence in the colony, and will be entitled to return passages to Calcutta under the 93rd Section of the new law.

Of these immigrants there were in the colony at the close of last year as follows:

	Men.	Women.	Boys.	Girls.	Infants.	
Per *Accrington* ...	160	60	24	27	13	
„ *Athletoe* ...	144	41	22	14	10	
„ *Ganges* ...	151	30	15	16	6	
Total ...	455	131	61	57	29	733 souls.

Of these 586 adults, 414 have notified their desire to remain in the colony with their families if bounties are given to them, and 172 will return to Calcutta with their families.

It being evidently in the interests of the colony, and advantageous as well as more economical to employers that as many of these acclimatised immigrants as possible should be induced to prolong their stay among us, it is to be hoped that the legislature will deal as liberally towards them as with those of previous importations by providing bounties for such of them as will accept thereof and remain for an extended period of five years. Should this be done, I have no doubt that many of those who have resolved to depart will change their minds and remain also.

9. *Relation between employer and employed.*—I cannot say that the conduct of the Indian immigrants towards their employers was otherwise than good generally during the year 1870. Peaceful, submissive to order, and industrious, they are nevertheless very sensitive and excitable when wages are withheld, or not fairly paid them. When fairly treated, they are contented and averse to change, and many instances can be adduced of the entire period of their engagement with the colony having been spent under one employer; on the other hand, if any dissatisfaction existed among employers, such may be traced to abstention on their part from adopting the new law by re-indenturing under its provisions and the effects resulting from the short contracts referred to in No. 7, the remedy for which was clearly in their own hands.

GRENADA.—A Return of the Indian Immigrants located on the Plantations in this Colony, in the several Districts thereof, as compared with the previous year, showing the increase and decrease during the year ended 31*st December* 1870.

Districts.	Number on estates on the 31st December 1869.								Increase in 1870.				Decrease in 1870.				In Gaol.		In Colony Hospital.		Number of estates on 31st December 1870.						Total.	
	Adults.		Children.		Infants.		Total.		Births.		Arrivals.		Deaths.		Departures.						Adults.		Children.		Infants.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
St. George	61	20	9	17	3	2	73	39	2	3	Nil.		1	...	...	...	1	...	1	...	66	24	16	22	2	5	86	51
„ David	95	39	20	21	5	3	120	63	3	1			2	3	1	...	...	...	1	3	88	36	31	19	9	4	129	62
„ Andrews ...	428	168	79	89	25	18	532	275	18	9			11	4	...	...	...	...	2	...	349	147	88	87	28	20	467	254
„ Patricks	288	113	49	52	13	15	350	180	15	10			8	9	...	...	2	...	5	1	290	117	71	64	19	16	387	198
„ Marks	7	4	4	2	2	...	13	6	...	1			...	...	...	...	...	...	1	...	12	6	2	4	2	1	17	11
„ Johns	21	13	11	3	1	2	32	18	2	1			1	1	1	...	1	...	...	...	21	11	10	7	1	...	33	18
Carriacon	1	...	...	...	...	...	1	...	...	...			...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...
Total ...	900	357	172	184	49	40	1,121	581	40	25	...	...	23	17	2	...	4	...	10	4	827	341	218	203	61	46	1,120	594

Immigration Office;
The 1*st February* 1871.

G. G. MUNRO,
Immigration Agent.

GRENADA.—A General Report on the sanitary condition of the Indian Immigrants located on the Plantations in this Colony, with a statement of the increase and decrease among them during the year ended 31*st December* 1870.

Name of Plantation.	No. of Return.	Number on Estate 31st December.		Births in half year.		Deaths in half year.					Sanitary condition of immigrants on personal inspection in the month of January, and remarks.
		M.	F.	M.	F.	Date.	Name of deceased.	Cause of death.	M.	F.	
Tempe	1	3	...	...	...	.....	.....	.....	...	...	In good health.
Carriere	2	18	4	...	...	August ...	Sahebjat, a boy...	Fever	1	...	Ditto.
Mount Horne ...	3	15	4	...	...	.....	.....	.....	...	...	Ditto. A better disposition evinced in treatment of the coolies since fine was imposed on proprietor for attempting to cast off the sick.
Prospect Park ...	4	1	...								
Springs	5	10	3	...	...	.....	.....	.....	...	...	In good health.
Bologne	6	53	39	...	1	.....	.....	.....	...	...	Two cases of yaws under treatment. Other coolies in good health.
Woodford	7	2	1	1	...	.....	.....	.....	...	...	In good health.
Palmyle	8	16	13	...	...	16th July ...	Mathew ...	Debility, an infant ...	1	...	Ditto.
Balthazar	9	36	27	...	1	13th July ...	Nundoo ...	Senile debility ...	1	...	Ditto.
Mount St. Irvans ...	10	1	...	...	...	.....	.....	.....	...	...	Ditto.
Bocage	11	1	...	...	...	.....	.....	.....	...	...	Ditto.
Samaritan	12	5	4	...	...	.....	.....	.....	...	...	Ditto.
Pearls	13	34	15	...	...	30th November	Oodhoo ...	Dysentery	1	...	Ditto.
Grand Bras	14	47	20	2	...	.....	.....	.....	...	...	Ditto.
Bell Vue	15	3	...	...	...	.....	.....	.....	...	...	Ditto.
Grand Bacolet ...	16	25	15	1	...	.....	.....	.....	...	...	Ditto.
Caliviny	17	29	19	...	2	.....	.....	.....	...	...	Beersye and an infant girl under treatment for yaws. The other coolies well.
Dougaldstone ...	18	15	5	1	...	.....	.....	.....	...	...	In good health.
Piedmont	19	4	2	...	...	.....	.....	.....	...	...	Coolies all well.
Diamond	20	12	9	...	1	.....	.....	.....	...	...	
Mount William ...	21	14	8	...	...	.....	.....	.....	...	...	Ditto.
Reguin	22	50	15	...	...	.....	.....	.....	...	...	Juthun was placed in Colony Hospital on 18th January by Agent for treatment of a bad thumb (bitten in a fight). Estate's Doctor had not seen him, and he was attending Assembly. Other coolies well.
Simon	23	26	8	1	1	3rd November ...	John, an infant...	Eutoza	1	...	Coolies in Simon and Marli well.
Marli	24	7	1	...	...	.....	.....	.....	...	...	
Montreuil	25	30	18	...	...	10th November	Sookul, infant ...	Fever	1	...	Two cases of yaws under treatment. Other coolies well.
Paradise	26	22	16	...	1	.....	.....	.....	...	...	One case of yaws and one of rheumatism. 'Dawhoo' found drowned under the bridge on this estate on 10th January 1871. He had been sick and had not had medical attendance. Proceedings taken against the proprietor. Other coolies in good health.

Sanitary Report,—continued.

Name of Plantation.	No. of Return.	Number on Estate 31st December. M.	F.	Births in half year. M.	F.	Deaths in half year. Date.	Name.	Cause of death.	M.	F.	Sanitary condition of the immigrants on personal inspection in the month of January, and remarks.
Clarkes Court ...	27	23	13	...	...	.....	.....	.....	...	...	Coolies on Clarkes Court and Corinth in good health.
Corinth ...	28	24	13	...	...	.....	.....	.....	...	...	
Mount Gay	29	10	5	1	...	.....	.....	.....	...	...	In good health.
Lesterre and Columbere ...	30	16	11	...	...	.....	.....	.....	...	...	Ditto.
Snell Hall	31	12	9	1	1	September ...	An infant ...	Debility	...	1	Ditto. Some dissatisfaction among the coolies here, wages not fairly paid. Stock-keepers complained of not being paid for Sunday's work. Explained to overseer in the presence of the coolies that they cannot be compelled to work on Sundays; but if they do work, they must be paid.
Mount Craven ...	32	6	...	...	...	.....	.....	.....	...	...	All well.
Telescope	33	32	23	3	1	.....	.....	.....	...	...	Some cases of yaws on this estate among the children. Other coolies well.
St. Cyr and Meribeau ...	34	24	11	...	...	.....	.....	.....	...	...	Koolwantee and Doyalchand under treatment for yaws. Other coolies well.
Lavalette	35	2	...	...	...	.....	.....	.....	...	...	Ditto ditto.
Belmont	36	47	30	...	1	.....	.....	.....	...	...	Coolies in general good health.
Lataste	37	19	14	...	...	10th September	Seeballack ...	Leprosy	1	...	Coolies all well except "Tilluchdharry," who has ulcers on leg, and is treated for.
Mornefendue... ...	38	36	20	1	...	.....	.....	.....	...	...	Coolies all well except "Sewtohul," who has crabs in feet of long standing. Recommended him to be sent to Colony Hospital for treatment.
				Twins.							
Lafortune	39	25	12	1	1	14th November	Adriana, child ...	Worms	...	1	Coolies on Lafortune all well. Sukolvee still an invalid of incurable disorder.
						5th December ...	Fooliah, a girl ...	Debility	...	1	
						Ditto ...	Twins ...	Ditto	1	1	
Dunfermline	40	26	12	...	...	.....	.....	.....	...	...	Coolies all well, but complained of cottages, leaking. Manager appeared to have intentionally absented himself.
Mount Rich	41	34	22	3	...	.....	.....	.....	...	...	Coolies all well.
Tuileries	42	24	11	3	...	.....	.....	.....	...	...	Some cases of yaw among the children on Tuileries, which are being treated in their cottages. Other coolies well.
Hope Vale	43	4	5	...	...	.....	.....	.....	...	...	Coolies well.
Union D	44	2	2	...	...	.....	.....	.....	...	...	Ditto.
Montrose	45	44	16	...	1	1st July ...	Chamalia ...	Syphilis ...	1	1	Ditto.
						5th ,, ...	An infant ...	Debility ...			
Westerhall	46	29	31	...	...	20th December...	Lilloo, a girl ...	Fever ...	1	1	Some cases of yaws among the children. Other coolies well.
						22nd ,, ...	Jeetoo, a boy ...	,, ...			
Hope	47	41	27	1	2	.....	.....	.....	...	...	Three cases of yaws under treatment. Other coolies well.
Observatory	48	19	5	...	...	7th July ...	Jaunalli ...	Injuries received in a drunken fight.	...	...	The coolies well. The case of Jaunalli reported in previous half-year.
Mount Rodney ...	49	22	13	...	...	.....	.....	.....	...	...	Coolies all well.
River Antoine ...	50	13	5	...	...	26th October ...	Sukurum ...	Dropsy	1	...	Coolies here are in pretty good health, but they complain of the barracks near to work being unhealthy. Attorney promises to have the same removed to a more healthy situation.
Plains	51	53	22	1	2	24th October ...	Somoreea, a girl	Worm fits	...	2	Mooklall ill, but progressing under treatment. Other coolies well.
						2nd November	Oomria, a girl ...	Fever			
Baillies Bacolet ...	52	24	7	...	...	5th July ...	Luckhyram ...	Do.	1	1	Coolies all well.
						10th August ...	Kumly, an old woman.	Dysentery.			
Grenville Vale ...	53	6	2	...	...	.....	.....	.....	...	...	Ditto.
Mount Parnassus ...	54	3	..	...	...	.....	.....	.....	...	...	Ditto.
						5th September	Boodhun ...	Accidental death ...	1	...	This man died in the town of Grenville from injuries by a horse. Coroner's jury returned a verdict of accidental death.
						3rd September	Curreembux ...	Debility from large ulcers	1	...	This man died in the Colony Hospital.
		Births ...		21	16	In half year to 30th June.		Deaths ...	15	9	in half-year to 30th June.
				19	9				8	8	
		Total ...		40	25			Total ...	23	17	

REPORT.

1. The sanitary condition of the Indian immigrants located on estates in this colony, when inspected by me personally in the month of January last, appeared to me, on the whole, good, notwithstanding the wet season of the last half-year, which is generally productive of diarrhœa and dysentery, disorders which afflict the immigrants, indulging as they do in ripe and unripe fruit.

2. The medical attendance on immigrants on estates was regular, with exception of the Parish of St. Patrick, where the resident practitioner, from severe indisposition, was unable for two months to give the proper number of visits. The aid of brother practitioners was occasionally available however. It must nevertheless be very apparent that one medical attendant for so large a district is quite insufficient, and which, unless remedied, may hereafter result in serious consequences to employers were the law to be put in force.

3. There were 65 births and 40 deaths during the year. The mortality in the past half-year occurred chiefly among the children, of whom 14 died, and, as compared with that of the previous year, the death-rate is lower, notwithstanding the disadvantage experienced as to short medical attendance above referred; a result which I attribute to acclimatization rather than to any better attention bestowed on the sick by managers on estates. I am strengthened in this conclusion by the fact that a larger number of coolie-patients were admitted into the Colony Hospital last year than in the preceding, namely, 131 in 1870 against 121 in 1869. There were only twelve admissions in 1870 with guarantees from their employers for the payment of the hospital charges. It must, therefore, be evident that the onus of restoring the sick Indian laborers to health (who are, with very few exceptions, located on estates) has been borne by the public. Were the sick coolies better looked after, these admissions into the public hospital at the capital would not be so large.

4. The convictions of the proprietors of Mount Horne and Dunfermline estates announced in my previous report, and the confirmation of the decision of the Police Magistrate in each case, by His Honor the Chief Justice on appeal, cannot fail to have a salutary effect on managers of estates, by inducing greater attention to the sick immigrants. I have had occasion to proceed against the proprietor of Paradise Estate for neglect on the part of the manager on that property to make available to "Dowhoo," when sick, the hospital accommodation and medical attendance required by law to be provided. I fear that this immigrant threw himself into the river in despair and was drowned. It is to be regretted that the penalty in this case is imposed on the employer, and not on the manager, who is really the culpable party, his attention having been called to the condition of this man by me by a letter.

5. Yaws continues prevalent among the immigrants, and has increased among the Creole laborers also. This loathsome and debilitating disease will not be stamped out, unless measures are adopted by the legislature to compel those afflicted with it into a lazaretto.

Immigration Office, Grenada;
The 1st February 1871.

G. G. MUNRO,
Immigration Agent.

From T. W. MURDOCH, Esq., Emigration Board, to SIR FREDERIC ROGERS, Bart.,—dated the 18th April 1871.

I HAVE to acknowledge your letter of 6th instant, with a despatch from the Lieutenant-Governor of Grenada, enclosing the half-yearly report to the 31st December last of Mr. Munro, the Emigration Agent.

2. It appears from these papers that at the end of 1870 there were located on the several plantations in the colony 1,714 coolies, of whom 1,120 were males and 594 were females. Besides these, there are said to be a few Indians who, having obtained bounties, reside on Upper Pearls Estates on lands which they rent there.

3. No emigrants were introduced in the year. The births number 65, and the deaths 40, showing a death-rate of 2·29 per cent., which is somewhat less than that of 1869. The deaths occurred chiefly amongst the children.

4. The recorded convictions and imprisonments were not numerous—20 in number;—and were chiefly for minor offences, one only being for burglary, one for cutting and wounding, and three for breaches of contract. To account for the few convictions on this latter head of offence, Mr. Munro supposes that these cases in which the defendants pay money into Court on conviction are not included in the returns, and he suggests, in which suggestion I concur, that all convictions involving loss of time to employers should be furnished to him, otherwise he cannot carry out the duties imposed on him by the 64th Section of the Emigration Act, 1869, No. 399.

5. In January 1866, 260 coolies were landed from the ship *Countess of Ripon*. Of these there are now in the Island 84 men, 50 women, 29 boys, 36 girls, and 18 infants, in all 217 souls, the adults among whom completed their industrial service on the 23rd January last; certificates will accordingly be issued to those entitled to them. During the five years, the deaths amongst this particular body of people were 67, or nearly one-fourth of the number landed, and the births 32. As the mortality occurred chiefly amongst the male adults and during the first two years of residence, Mr. Munro thinks that non-acclimatization and sudden change of diet has much to do with it. He recommends, therefore, that coolies should receive rations instead of wages for the first two or three months after arrival. The principle of rationing the emigrants has now been adopted with successful results in Mauritius, British Guiana, Trinidad, and Jamaica, and I see no reason why it should not be extended to Grenada.

6. During the ensuing year 733 being the remainder of the emigrants imported in 1862 in the ships *Accrington*, *Athletoe*, and *Ganges*, will be entitled to return passages. But of 586 adults, 414 have notified their desire to accept bounty and remain in the colony with their families. The remaining 172 will be sent back to India, unless, before an opportunity of doing so occurs, they are induced to forego their claim.

7. In commenting on the working of the Emigration Act No. 399 of 1869, Mr. Munro observes that no emigrant has been re-indentured under it, and that at present there is not a single coolie under an annual contract of service. The Act (Section 51) provides for re-indenture for periods of five years and for no shorter terms. This Mr. Munro considers inexpedient, and that shorter contracts would be preferred both by employers and labourers. The Lieutenant-Governor explains, however, that no reports have reached him of any emigrant being unable to obtain employment, and that in repealing the Act No. 256 it was thought desirable to promote the system of long contracts by the offer of a bounty of £10 to the emigrant on each occasion of re-indenture, and throwing the back passage on the Emigration Fund instead of requiring an annual payment of a small sum from employers towards the cost of back passages.

8. Mr. Munro considers also that the repeal of the Act No. 390, which secured a back passage to certain emigrants at the expiration of a second term of indenture, may be looked upon as breach of faith. But the Lieutenant-Governor points out that in this Mr. Munro is in error, inasmuch as the 93rd Section of the repealing Act, No. 399, expressly secured their right.

9. Besides his general report Mr. Munro forwards a sanitary report upon which Lieutenant-Governor Mundy comments, and states that to prevent the abuse of throwing upon Colonial funds hospital expenses for which the estates are liable, he has directed that in future the Agent's visits to estates should be made quarterly instead of half-yearly.

10. On the whole these reports are satisfactory as regards the emigrants.

Results of Experiments with Compton's Chemical Manure.

MESSRS. C. H. COMPTON & Co. having written to Government offering to supply samples of Australian chemical (bone) manure for the cost of carriage, the Government of India, in July 1869, ordered two tons from the firm for experiment.

This quantity was sent in October 1869 to the Governments of Bengal, the Punjab, and the North-Western Provinces, and the Chief Commissioner of Oudh, for distribution to the Superintendents of the Botanical Gardens, Calcutta and Saharunpore, and the Agricultural and Horticultural Societies, Calcutta, Lucknow, and Lahore, one ton being thus used up, and the other ton was sent to the Cotton Commissioner for the Central Provinces and the Berars to be tried upon his model cotton farms.

REPORTS OF RESULTS.

I.—North-Western Provinces, No. 1302*A*, *dated* 21*st September* 1870, *and No.* 1131*A*, *dated* 15*th July* 1871.

Dr. Jameson reported in July 1870 that, on his return from furlough in the November previous, he found lying in the godowns two barrels of the manure which had not been used in any way. He says,—"Though the season was then far advanced, I applied about a fourth of the quantity, a maund, as a top-dressing to some pedigree wheat and other cereals that had been received from England during the season. But the results were most unsatisfactory, as the cereals only seeded very sparingly. To annuals in the form of liquid manure it was also applied, but the blooms were not superior to those manured with common city guano. The lateness of the season in which it was applied as a top-dressing to cereals may account for its failure." Dr. Jameson kept about half the quantity received for further trial on cotton, paddy, &c., and promised a further report. The Government of the North-Western Provinces in sending on this report said, that the failure was probably attributable to the lateness of the season in which the manure was applied.

The further trials, however, made in 1870, were equally unsuccessful. In his report dated the 22nd June 1871, Dr. Jameson said—"Experiments have been made with it on cereals, vines, and many flowering shrubs, both annual and perennial, with most unsatisfactory results, as the improvement in the plants was not equal to that brought about by city or cowshed manure."

II.—Oudh, No. 5243, *dated* 25*th October* 1870.

The manure was made over to Dr. Cameron, Superintendent of the Department of Science, Lucknow. In the absence of information regarding the chemical composition of the manure, or its uses or mode of application, Dr. Cameron made over the whole consignment to the English practical gardener in charge of the public gardens, with instructions to try it on a variety of crops of garden-produce as opportunity offered, and to report the results. The report was, Dr. Cameron says, in substance as follows: "The patent chemical manure was tried on crops of cabbages, carrots, turnips, and lettuces. The cabbages received two top-dressings, and one application to the roots before earthing up. The carrots, turnips, and lettuces received two top-dressings only. These vegetables were not equal to others which had been dressed with night-soil, or even to those grown on soil which had been manured with a mixture of cow-dung and night-soil. It was also tried on flower annuals without any obvious effect. The plants thus treated did not thrive better, and the flowers were not larger or more prolific than those which had been dressed with leaf-mould, or the other ordinary manures. It seemed, however, to answer very well in the form of a liquid manure for weakly plants. With this exception the results of its application have been entirely negative." Dr. Cameron thinks the manure is suited to a clayey soil, which is capable of holding it, but that it will not answer for the alluvial soil of India where frequent irrigation probably carries it readily down into the sub-soil and out of reach of the plant. Dr. Cameron reserved a portion of the manure for trial on wheat and other grains, which he was going to cultivate experimentally during last cold season, and promised a further report in due course. No further report has been received.

III.—Punjab, from the Secretary to the Agricultural and Horticultural Society, Lahore, dated 15*th November* 1870.

"The manure sent was extensively tried with our crops of peas, turnips, and also with various kinds of flower seeds in the proportion of four cwt. to each acre

of soil. The results of this application were in every way good, and quite equal to the effects of the city manure on similar crops." But the Society said the cost of the manure (probably £20 a ton at Lahore) was so much greater than the cost of city manure (10 annas for $\frac{1}{8}$ of a ton), the supply of the latter being also very abundant, that it was obviously undesirable to use it in such a place, though it might be of great service in places where natural manure was deficient or expensive.

IV.—Bengal, letters of 17th November 1870, *No.* 4477, *and 8th May* 1871, *No.* 1684.

With the first letter the Government of Bengal sent the following report from Mr. John Scott, Curator of the Botanical Gardens, Calcutta:

"I have tried Compton's patent chemical manure on cotton, sugar-cane, and guinea grass. Having no knowledge as to the character or potency of the manure, I, in my first experiment, applied it in much the same quantity as I would good guano. I also repeated the application twice at intervals of from 10 to 14 days, but on none of the above crops did the portions thus treated present any very marked difference from those which had received no manure. I have also tried it (on the previously mentioned crops) weight for weight with oil-cake, and the results show very clearly that the latter (oil-cake) is alike the more energetic and productive."

The Agri-Horticultural Society distributed the quantity given to it among thirty members for trial. The following five members of the Society have reported the results of the trials made by them:

Colonel Edward Money, of Sengoo Plantation, Chittagong, November 20th, 1870.

"I tried the manure very carefully, and could perceive no benefit whatever from it. No one believes more in the advantages of manure for tea than I do, but I found no advantage from this."

Mr. E. C. Bayley, Calcutta (no date).

"I tried it in small quantities, and with several different kinds of plants. I applied it round the roots of dahlias and artichokes, and dug it in with roots of dahlias. I used it also with onions as a top-dressing. In no case, however, did it appear to produce any result. In every instance I applied it only to a certain portion of the bed, and in every case the bed seemed as good where no chemical manure was applied as where it was. My trial was necessarily not very extensive, but, so far as it went, the results were not in favor of this new manure."

Mr. W. Pigott, Calcutta, 16*th November* 1870.

"I was unable to discover that any benefit was derived by the plants to which I applied Compton's patent manure. I only applied it to a few rose-trees and not to any culinary vegetable or agricultural plants of any kind."

Mr. C. G. D. Betts, Aurungabad viâ Pakour, 12*th November* 1870.

"I applied it as directed on 5 cottahs of land, being a portion of 20 beegahs, which I sowed in paddy, and which I had manured with animal manure. The former gave me a produce at the rate of 20 maunds the beegah (of 14,400 square feet), while the latter yielded about 12 maunds. My tenants, who had sown paddy all round my field, were (owing to the bad season) very unsuccessful with their crop. I dont believe that on an average they got more than three maunds the beegah. I should observe that my land was highly cultivated, well ploughed, and twice weeded, whereas my ryots only weeded their lands once. My opinion is, that the chemical manure would answer very well for all crops in India, and that it would pay."

Messrs. Begg, Dunlop & Co., Calcutta, 12*th July* 1871.

"None of our managers [of tea-gardens in Assam] to whom the manure was sent were able to carry out successfully any experiments with it, and we have consequently no information of any value to give you regarding it." In the letter sending on this report, the Government of Bengal says that, as the degree of care with which the trials were conducted is not reported, the results cannot be considered conclusive. No further reports have been received from Bengal.

No 3524, dated Allahabad, the 18th July 1871.

From—H. RIVETT-CARNAC, ESQ., Cotton Commissioner.

To—The Secretary to the Government of India in the Department of Agriculture, Revenue, and Commerce.

WITH reference to the letter of the Secretary to the Government of India in the Home Department, No. 1644, dated 24th of March, and previous correspondence, I have now the honor to report on the experiments made with Compton's patent manure at the farms in the Central Provinces and the Berars.

2. This report would have been submitted at a much earlier date had it not been that I was anxious, if possible, to submit detailed information regarding the produce of the land to which the manure was applied, as compared with the crop on the adjoining unmanured fields, together with a tabulated statement showing the financial results. After much inquiry, however, I have ascertained that, for the reasons to be noticed in a later paragraph, it will not be possible to supply this information in a satisfactory manner, or to submit the report in the form which I had first planned.

3. The orders of the Government of India to procure a supply of this manure, and to try its effect on the cotton farms, were unfortunately not received until the month of August. No time was lost in obtaining a supply from Bombay, but by the time the casks reached the farms, the plants were well above ground, and the manure, instead of being ploughed into the ground before the sowing of the seed, had to be applied as a top dressing by which its effect was much diminished. The results were indeed so unfortunate that, as the trial could not be considered a fair one, no special report was made by the Assistants on the subject, and the matter was allowed to stand over until further and less unsatisfactory experiments could be undertaken. The following details have now been received in answer to the call made by the Home Department.

4. Mr. Dunlop, the Assistant to the Cotton Commissioner, West Berar, thus reports:

"The manure arrived late in the season, and was applied as a 'top dressing' to the plants. Owing to this, probably, no marked effect was noticeable in that season's crop; and, as you are aware, the present farm is now situated in a different locality.

"Although, however, the farm could not benefit by the manure, I arranged with one of my former pupils that he should cultivate the manured land with cotton, and in this way I have been able to give it a fair trial.

"The area of manured land was two acres. It was re-sown with 'Bunnee' seed in the beginning of last rains. The plants came up well, and were large, strong, and fresh-looking, while the ordinary cotton plants were leafless and withered. The crop has been wholly picked, the turn-out being at the rate of 78 lbs. of clean cotton per acre. The seed was sown thinly, which explains the small out-turn. The field might have contained 40 per cent. more plants, and this year's experience has shown us that there is no advantage in thin sowing.

"A small quantity of the manure was also given to some land in which the owner has this season cultivated maize. The crop was the finest of the kind I have yet seen in Berar: many of the stalks bearing two large-sized

heads. I should mention, however, that this field had also been deep-ploughed the previous year.

"With these results, I conclude that the manure is quite a success, in so far as it improves the soil and stimulates the plants; but I doubt if it could be laid down sufficiently cheaply to give a satisfactory financial result to the cultivator."

5. The following report from Mr. Nago Rao Jeyá Krishná, the Assistant to the Cotton Commissioner at Oomraotee, confirms very much the views expressed by Mr. Dunlop as to the late arrival of the manure affecting the experiment:

"I have the honor to report that about 550 lbs. of Compton's patent chemical manure were supplied to me by Messrs. Stearns, Hobart and Company; but, unfortunately, the manure reached the Oomraotee model farm towards the end of August, when the cotton plants were in flower, and the manure was, therefore, applied only as a 'top dressing.' Moreover, there was no water at the farm to irrigate the manured parts, and consequently the result was not as favorable as it was expected. The manured plants looked a little stronger and better than the unmanured."

6. The experiments above referred to were undertaken during the season of 1869-70. Instructions were issued to supply the farm in the Wurdah Valley with 5 cwts. of this guano for experiment. The supply arrived so late that, in accordance with my instructions, the guano was reserved until last season, when it was applied at the Mudnee Farm under the direction of Mr. Noble.

7. Here, too, the experiment was most unfortunate. The River Bore, across which a dam had been thrown in accordance with a scheme for irrigating the model farm, overflowed and inundated the adjoining lands, including that which had been prepared with this manure. The results are described in the following extract from Mr. Noble's report:

"The effects of the manure at first were very apparent, causing the young seedlings to grow up sturdier and quicker than the others. But, after the growing plants had been up for a short while, nearly the whole of the farm was inundated twice, the second flood occurring about eight days after the first. All the manured portion was completely flooded, and no doubt the greater portion of the manure must have been carried away with the flood, or perhaps distributed over all the land which was flooded. In consequence, I do not think it would be fair to take the manured portion as a fair sample of manured cotton. The plants in this piece (manured with the cotton manure) are not superior to some other parts of the farm. One portion of this piece was completely re-sown ('bukhars' having first been passed over), and this part is superior to the other which was not re-sown.

"From what I have written above, and in my weekly reports at the time the floods occurred, I think you will agree with me that I am not well able to speak positively about what effects have resulted from the use of the manure. If this manured portion had turned out superior to the rest of the farm, then, of course, allowing a difference for different kinds of soil, it would have been apparent that this superiority was due to the use of the manure, but such is not the case. Some parts of it are, perhaps, equal to the other parts of the farm, but there are also some parts of it decidedly inferior."

8. It must, then, be admitted that the manure has not yet had a fair trial. In fact, the experiments were undertaken under such manifest disadvantages that, as already noticed, no special record was kept on the subject. I was therefore anxious to try its effects again this season; but, on application to the agents in Bombay, I learnt that none of the manure is available in Bombay. Should His Excellency the Governor General in Council desire it, arrangements can be made to ensure a supply being obtained early next year, so as to admit

of the fertiliser being well ploughed into the soil before the seed is sown, and the effect thus being thoroughly tested next season.

9. Judging from the accompanying analysis of the manure, and of the black cotton soil of the Deccan, there can, I think, be little doubt that the manure, if properly applied, would benefit the cotton fields of the Berars, although exactly to what extent it is not possible to predict, by giving back to the soil many of those fertilizing ingredients which the cotton plant absorbs. The following is the analysis of the manure as given by Messrs. Compton and Company:

Ammoniacal organic matter	23·5
Alkaline salts	9·5
Phosphate of lime and magnesia	17·5
Sulphate of lime	7·0
Carbonate of lime and magnesia	18·5
Vegetable organic matter	9·0
Silicate alumina and sand	5·0
Water (hygroscopic)	10·0
TOTAL	100·0

Ansted's analysis of the "*regur*" or black cotton soil of the Deccan is as follows:

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
TOTAL	100·00

10. The chief question involved in the proposed use of this and other imported fertilisers rests, however, on the point whether they can or cannot be used by the cultivators of the Berars at a profit, *i. e.*, whether, after deducting the expenses connected with the purchase and application of the manure, the extra yield of cotton resulting from the use of the fertiliser will leave a balance of profit in the hands of the ryot, sufficient to encourage him to adopt this improved system of farming.

11. Another question also is involved which will be noticed at the close of this report, and that is, whether manure to any great extent can safely be used without a supply of water ready at hand to be applied in the event of the rain-fall failing.

12. Although, for the reasons already stated, it is not in my power to give reliable figures shewing the actual yield of cotton on the lands at the farms which enjoyed the advantage of the manure, compared with the yield on those lands to which no manure was applied, still I am able to give the cost of the manure as laid down on our farms, and from this it may be judged whether there is a fair probability of this and other imported chemical manures being generally adopted in the Berars.

13. The cost of this manure delivered at Bombay or Calcutta is £8 per ton. The railway carriage on goods of the first or lowest class is 9·5 pie per ton per mile for distance over 400 miles, with a terminal charge of Rs. 2-1-9, and in this class fertilisers would apparently be included. Now Oomraotee, which is about the centre of the Central Provinces and Berar cotton field, is 438

miles from Bombay, whilst Nagpore, which is quite at the Northern extremity, is 539 miles distant from that port; Mulkapore the nearest point being 327 miles distant from Bombay. It will not then be unfair to calculate that if this manure were generally adopted in the cotton-growing country, then that, in addition to the cost of £8 per each ton at the sea port, an additional charge of about pies 9·5 × 400 pies (the rate per ton per mile multiplied by the number of miles which the manure would have to be carried) or Rs. 19-12-8 *plus* a terminal charge of Rs. 2-1-9, making a total charge of Rs. 21-14-5 for railway freight, would have to be incurred for each ton laid down in Central India, bringing the total cost of a ton of manure up to Rs. 101-14-5.

14. Now, supposing that this manure was applied to the soil at the rate of 2 cwts. per acre (in America much greater quantities are used), the cost of the manure per acre delivered at the cotton field in Central India, would be Rs. 10-3-0½. To this, again, has to be added the cost of spreading the manure and working it into the soil, &c. This, from a careful estimate that has been framed and checked by the actual charges incurred in applying manure of a somewhat similar description last season, amounts to Rs. 2-2 per acre, calculated as follows:

	Rs.	A.	P.
Spreading 2 cwts. of manure over one acre of ground, four men at four annas per diem	1	0	0
Ploughing the manure into the ground with "bukhur" (one *bukhur* per one day)	1	0	0
Carting 2 cwts. of manure to the field, say on an average	0	2	0

15. The estimate is framed for land near the railway line. The cartage to places at a distance would of course be more expensive.

16. The total cost to the cultivators of the 2 cwts. of manure up to the time of its being ploughed into the soil would then be as follows:

Cost of 2 cwts. of manure sufficient to sow one acre of cotton land.

	Rs.	A.	P.
Cost in Bombay	8	0	0
Railway charges	2	3	0·5
Cost of ploughing into the land	2	2	0
TOTAL ...	12	5	0·5

17. To ensure the cost of the manure being repaid to the cultivator, it would be necessary, then, that the acre to which the manure was applied should bear a certain number of pounds clean cotton in excess of that produced by the neighbouring land, which did not enjoy the advantage of the manure, and on which thus the expenditnre of Rs. 12-5-0·5 shown above would not have been incurred.

18. Given the price of cotton per pound in the cotton districts, it becomes then a not very intricate Rule of Three sum to determine how many additional pounds of cotton it would be incumbent on the one acre of manured land to grow in excess of that grown by its neighbour, the less favoured acre, to enable the cultivator to cover the expenses of the experiments. Now the price of cotton has varied very considerably during even the the last few years. I put the prices that were touched during the American war out of the question, as we are not likely to see them again at present.

19. Now the price of cotton per pound in Liverpool, by which the price of the staple at the markets of Bombay and up-country is generally governed,*

* I say generally, because sometimes from the action of speculators or one cause and another, the price of cotton in Bombay and the up-country markets is actually higher than in Liverpool!

stood during the past cotton-selling season, *i. e.*, from December to the end of May, as follows:

PRICE PER POUND.

H. denotes the highest quotation, L. the lowest.

Months.	Fair Dhollera.		Fair Oomraotee.		Fair Hingunghât.	
	H.	L.	H.	L.	H.	L.
	d.	*d.*	*d.*	*d.*	*d.*	*d.*
December	6 7/16	6½	6⅝	6½	7¼	7⅛
January	6½	5⅞	6⅝	6½	7¼	7¼
February	6¼	6⅛	6⅝	6⅝	6⅝	6⅝
March	6⅛	5⅞	6¼	6	6⅝	6½
April	6⅛	5⅞	6¼	5⅞	6⅝	6¼
May	1 1/16	5¾	6⅛	5⅞	6¼	6

20. Since, then, the market has improved, and Fair Dhollera was quoted at Liverpool on the 15th instant at 7 7/16*d.* per pound. The cotton of our Provinces is, as will be seen from the above statement, worth rather more than the "*Fair Dhollera*," the standard quotation; for instance, when Fair Dhollera stood at 6 1/16*d.* Fair Oomraotee was selling at 6⅛*d.*, Fair Hingunghât at rather a higher figure again at 6¼*d.*

21. The price of cotton in the Berars from December to the end of May, when the selling season closed, has varied in a manner corresponding, cotton being sold at Oomraotee (the sales at which market I propose to take as the standard for my calculation) from Rs. 52 per bojah of Rs. 260 to Rs. 48 per bojah of the same weight. This year prices have admittedly been very low. During the present month, however, consequent on the Liverpool quotations, the price rose to Rs. 63 per bojah.

22. I propose then taking Rs. 60 per bojah as a fair average, and at this price the Berar cultivator gets, if we value the rupee at 2*s.*, a trifle more than 5½*d.* or 3 annas 8 pie per pound for his cotton, the exact figure being 5·542*d.* (with exchange at 1*s.* 10¾*d.* it is 5·25*d.*).

23. The Liverpool price corresponding with cotton selling at Oomraotee at Rs. 60 a bojah or 5·25*d.* would be, roughly speaking, about 7·366*d.* per pound,* which, considering the present condition of the trade, may, I think, be accepted as a fair price on which to base the following calculation.

I have adopted present exchange 1*s.* 10¾*d.* = 1 Rupee.

* It may be satisfactory to show how this figure is arrived at. Three bojahs of 260 lbs. each equal to a Bombay candy of 784 lbs. (or two bales of 3½ cwt. each); the dry Berar cotton gaining some thing small i n weight in the damp climate of Bombay, and the difference of 4 lbs. being thus accounted for.

The price of one candy of 3 bojahs (784 lbs.) at Rs. 60 equals to Rs. 180, but to this has to be added the expenses incident on sending this cotton to Bombay, agency, pressing charges, frei ;ht, &c. These charges are taken at about Rs. 34 a candy, and the price of a candy of Berar cotton laid down in Bombay is thus brought up to Rs. 214 per candy of 784 lbs. Now the equivalent Liverpool quotation for Oomraotee cotton, costing in the Oomraotee market Rs. 60 per bojah (or 5·25 to the cultivator) and selling in the Bombay market at Rs. 214 per candy, would be taking exchange at 1*s.* 10¾*d.* per rupee, and freight (Suez Canal) at £3 per ton, and allowing the usual charges for commission, insurance, &c., 7·366*d.* per pound. The calculation will vary slightly according to exchange, freight, &c., but the above will be found nearly correct.

In fact, when the Manchester spinner can afford to give 7·366*d.* for "Fair Oomraotee," the cultivator in Berar gets about 5½*d.*; of this sum, the balance of upwards of 2*d.* being absorbed in the charges incurred in agency, freight, &c., between the Oomraotee cotton market and the factory in Manchester. I have thought it desirable to work out the figures, and give the details in an Appendix.

24. The ryot then sells his cotton at 3 annas 8 pie a pound. The manure costs Rs. 12-5-0·5 per acre. To ascertain then the number of additional pounds of cotton that the manured acre must yield to repay the cost of experiment, the following sum has to be worked out:

Rs.	A.	P.		Rs.	A.	P.		lb.	lbs.
0	3	8	:	12	5	0·5	: :	1	= 54

which gives, as will be seen above, 54 lbs. of cotton as the result.

25. It will be seen then that, for the manure to repay the expenditure, it would be necessary that the acre so manured should yield 54 lbs. more cotton than an acre of unmanured land of similar quality. There would also be a corresponding quantity of seed in excess; but, as the additional seed would have to be put against the additional expense of cleaning the increased quantity of cotton, it may be excluded from the calculation.

26. Now, as the Berar cotton lands in a good season bear from 80 to 100lbs. of cleaned cotton to the acre, it would not be an extraordinary success for a fertiliser to achieve to increase the produce by, say, 50 per cent., and it will be seen from the above calculation that such an increase would about pay the cost of the experiment. This would of course be a very satisfactory result for the trade, as the supply of the raw material would be increased, but hardly gratifying to the cultivator who, in reward for some extra trouble, risk, and anxiety, would only just be able to pay expenses incurred. If the crop were doubled by the manure the ryot would then make a profit of about Rs. 12 per acre. But I doubt if this effect could be expected from the fertilisers as a continuance. It is however to be remembered that in the Berars the experiment is weighted by a railway freight of Rs. 2-3-0·5, or 18 per cent. having to be paid on the manure; and if this charge be deducted, as would be done in the case of an experiment undertaken near the sea coast, then, with cotton selling on the spot at Rs. 60 per bojah of 260lbs., an extra yield of not more than 44lbs. would be required to cover the expense of the experiment, and thus an increased yield of 50lbs. would give the cultivator a profit of Rs. 1-6 per acre.

27. I fear, however, these figures, though not, perhaps, discouraging, are not very hopeful for the imported manure. No one feels more strongly than I do the importance of trying to increase the yield per acre of our cotton tracts. But I believe that we must look to a cheaper fertiliser than that which can be imported from abroad, and with this object experiments are being made with *poudrettee*, prepared on the dry earth system, and with several other descriptions of manures.

28. Native cultivators are, it is well known, fully alive to the benefit resulting from the use of manure. In the Berars the patches on which irrigated crops are raised, receive as much of the cattle manure as can be spared after the quantity set aside for fuel has been supplied. But where irrigation is not available, but little manure is used. This arises from two causes,—the one, that but little manure is available; the second, that the application of manure in any considerable quantity to land which cannot be artificially watered, in the opinion of the Natives who are not bad judges in such a matter, is attended with some risk.

29. The subject is explained in the following paragraphs of my report for 1868-69, paragraphs 90, 91 and 92, page 73, which for facility of reference are quoted below:

Para. 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.

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 draught, will be an utter failure, the manure exciting the plant, burning it up, or driving it to wood; that he is a poor man dependant 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 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 rain-fall. 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 cultivator paying an annual premium on the insurance in the form of a water-rate.

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 not certainly 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 fertiliser; and the fertiliser entails irrigation; and I believe it will be found in the long run that irrigation we must have.

30. Up to the present moment, however, the schemes for irrigating the cotton lands in the Central Provinces and the Berars, have not, so far as I am informed, progressed beyond the preliminary stages, and until more progress is made in this respect, we cannot, I fear, do much for increasing the yield of cotton in Central India by the use of fertilisers.

31. The reports I am now receiving from Berar show that this season the rain has held off, and that the crop is suffering. If the rain returns soon, I hope that our sturdy little cotton plants will yet pull through. But had the cotton-growing tracts been heavily manured, there would, I think, have been little hope of the plants, stimulated by the manure, making a stand against the ill effects of the scarcity of rain.

32. It may be noted here that several experiments have been made during the past season with other descriptions of manure. I have purposely omitted any detail of the results in this report, which refers to the manure received from Australia.

Calculation—cost of Oomraotee Cotton laid down in Liverpool.

THE cost in Oomraotee and charges from thence to Liverpool are given *approximately*.

They will vary according to many circumstances that need not here be detailed.

Price at Oomraotee.

The cultivator sells his cotton in the Oomraotee market to the European agent for Rs. 60* a bojah of 260 lbs., *i. e.*, the ryot pockets 3 annas 8 pies per pound which, at 1*s.* 10¾*d.* exchange, is equal to 5·25*d.* per pound.

The price realized by cultivators per pound there is 5·25*d.*

Charges between Oomraotee and Bombay.

The calculations are now made on the Bombay *candy* of 784 lbs., which equals three bojahs of 260 lbs. *plus* 4 lbs. minus difference gained in weight by Oomraotee cotton in the damp climate of Bombay—

		Rs.	A.	P.	Pence per pound.
Charges between Oomraotee and Bombay.	Price of a candy or 784 lbs. of cotton at Oomraotee ...	180	0	0	or 5·25
	Pressing in bales ready for shipment per candy (2 bales)	7	0	0	
	Railway freight from Oomraotee to Bombay, including terminals on 784 lbs. (*plus* 40 lbs. tare) *i. e.*, on 824 lbs. at Rs. 1-11-6 per maund of cotton of 82 lbs.	17	0	0	
	Petties, discount on Bombay bill, &c.	2	0	0	
		206	0	0	
	Commission at 4 per cent. ...	8	0	0	
	Total cost of a candy laid down in Bombay ...	214	0	0	or 6·209*d.*

Thus, charges between Oomraotee and Bombay Rs. 34-0-0 or ·959*d.*

Charges between Bombay and Liverpool.

	Rs.	A.	P.		Pence per pound.
Price of a candy of 784 lbs delivered in Bombay, as shown separately	214	0	0	...	6·209
Brokerage at ¼ per cent.	0	8	7	Charges between Bombay and Liverpool.	
Shipping charges and petties	2	0	0		
Freight at £3 per ton	15	0	0		
English charges and fire insurance, ½ per cent. ...	2	0	0		
Rs.	233	8	7		·807
Insurance at 2½ per cent.	5	13	8		
... Rs.†	239	5	10		
Discount (one month and-a-half) at 1 per cent. ...	2	6	9		
Price at Liverpool (without profit)	241	12	7	...	7·016
Profit at 5 per cent.	12	1	5	...	·35
Total price in Liverpool Rs.	253	14	0	for 784 lbs.	or 7·366

(*a*)—Thus the ryot gets ... ... 5·25*d.* per pound.
(*b*)—Charges from Oomraotee to Bombay (including Agent's commission) ... ·959*d.* ,,
(7)—Charges between Bombay and Liverpool ... ... ·807*d.* ,,
(8)—Add profit at 5 per cent. ... ·35*d.* ,,
7·366*d.* ,,

Exchange at 1*s.* 10¾*d.* to the rupee.

* Rupees 60 per *bojah* is above the average price of the past season, which was, comparatively speaking, a bad one for the ryot, the price having ranged from Rs. 48 to Rs. 52 per *bojah* since the rise in the price of cotton at Liverpool: since June the price at Oomraotee is more than Rs. 60.

† Trade discount at 3½ per cent. is generally given. I have not taken this into account.

ALLAHABAD,
COTTON COMMR.'S OFFICE;
The 22nd July 1871.

H. RIVETT-CARNAC,
Cotton Commissioner.

Resolution by the Government of India in the Department of Agriculture, Revenue, and Commerce,—Nos. 94-99 dated Simla, the 16th August 1871.

READ the following papers containing reports on experiments made with Compton's Patent Manure:

Home Department letters Nos. 4651 to 4659, dated 11th October 1870.
From Government, North-Western Provinces, No. 1302A, dated 21st September 1870.
From ditto ditto, No. 1131A, dated 15th July 1871.
From Chief Commissioner of Oudh, No. 5243, dated 25th October 1870.
From Secretary to Agri-Horticultural Society, Punjab, No. 15—115, dated 15th November 1870.
From Government of Bengal, No. 4477, dated 17th November 1870.
From ditto ditto, No. 1684, dated 8th May 1871.
From H. Rivett-Carnac, Esq., Cotton Commissioner, Central Provinces and Berar, No. 3524, dated 18th July 1871.

OBSERVATIONS.—From the various reports of the experiments that have been made, it appears that, so far as this manure has yet been tried in India, it has not proved a success. It is not, however, impossible that its apparent failure may be due to some error in the methods of applying it, and a communication will be addressed to Messrs. Compton and Company on the subject.

ORDER.—Ordered, that a copy of this Resolution, of Mr. Carnac's Report in full, and of the précis of correspondence, be forwarded to Messrs. C. H. Compton and Company, and that they be invited to furnish Government with two tons of their chemical manure for further experiment, on the same terms as before, together with any remarks they may have to offer as to the probable causes of the unfavorable results of past experiments, and full and detailed instructions as to the best methods of employing the supply now asked for; also, to state what would be the lowest price per 100 tons for which they could deliver the manure free of all other charges at Calcutta, Madras, and Bombay, in the event of considerable quantities being at any time required; as even if future experiments should prove more successful than those hitherto undertaken, the possibility of largely utilizing this manure must depend chiefly on the price at which it can be delivered in India.

Ordered also, that a copy of this Resolution, Mr. Carnac's Report, and the précis of correspondence be forwarded to the Secretary to the Agri-Horticultural Society, Punjab, for information, and to the Governments of Bengal and the North-Western Provinces, and the Chief Commissioner of Oudh for information and communication to the societies, superintendents of public gardens, and private parties who have tried and reported on this manure.

Ordered also, that a copy of this Resolution and of the précis of correspondence be forwarded to the Cotton Commissioner of the Central Provinces and Berar.

Ordered further, that this Resolution, Mr. Rivett-Carnac's Report, and the précis of correspondence be published in the Supplement to the *Gazette of India*.

Introduction of the Ipecacuanha Plant into India.

From Her Majesty's Secretary of State for India, to the Government of India,—No. 69, dated India Office, London, the 16th November 1870.

IN continuation of my despatches numbered 27 and 52, and dated, respectively, the 20th of April and the 28th of July, on the measures taken for procuring a supply of ipecacuanha plants for introduction into India, I transmit to your Excellency in Council ten printed copies of a Report* by Dr. Christison, of Edinburgh, on the plants now being reared there for this purpose, under Mr. Macnab, of the Royal Bonatical Gardens, and in the nurseries of Messrs. Lawson.

* Dated 25th October 1870.

2. Since this letter was received, I have received with very deep regret the intelligence of the death of Dr. Anderson, Superintendent of the Botanical Gardens at Calcutta, to whom, on your recommendation, I had entrusted the conduct of this experiment. It will not be easy to provide a substitute for this able and zealous officer, but the progress which he had made, with the help of Dr. Christison and the other gentlemen mentioned before, has been so satisfactory that the safe conveyance to Calcutta of such plants as may be fit to be moved is now the chief difficulty. Dr. Thomas Farquhar, of the Bengal Medical Service, as you are aware, took an early interest in this experiment, and I have selected him for the duty of conveying such plants as are ready. I enclose a copy of the instructions addressed to him, and of the reply to Dr. Christison.

3. Dr. Hooker will still be ready to receive any plants at Kew which it may be found expedient to send to him, and to transmit them to India as opportunity may occur.

From D. R. CHRISTISON, ESQ., to the Under Secretary of State for India,—dated 40, Moray Place, Edinburgh the 25th October 1870.

I REGRET to have to intimate to you, for the information of Her Majesty's Secretary of State for India, that Dr. Thomas Anderson, who is in charge of the preparations here for the introduction of the culture of the ipecacuan plant into India, has been for nearly two months so seriously ill as to have been unable to attend to any business. Although his state of health is improved, he continues to be wholly incapable of transacting business, and he has, therefore, requested me to report to you the progress of his preparations here.

This progress has not suffered from his illness, because fortunately the necessary measures for multiplying plants had been previously organized thoroughly by Mr. Macnab, Head Gardener of the Edinburgh Royal Botanic Garden, and also by Messrs. Lawson, Nurserymen.

I have carefully examined, on the 22nd, the plants in both places, and have to report that the progress made is eminently satisfactory.

In Messrs. Lawson's nursery stove there are now 110 healthy young plants reared from cuttings of specimens obtained by them from Belgium, and these plants are of such size that, if thought advisable, many of them might be transported to India in January next. There are also about 200 newly-risen plants from cuttings of others of the same age with these now mentioned. One plant only has flowered in Messrs. Lawson's stove.

In the Botanic Garden there are four sets of plants—

(1.) Forty plants somewhat farther advanced than the majority of those of Messrs. Lawson, which I have described as nearly ready for removal to India. Many of these have flowered, and their progress is such as to have induced Mr. Macnab to prepare them for the journey.

(2.) Sixty plants raised from cuttings obtained from the former set, younger therefore, but well forward, and very healthy and thriving to appearance. The originals of both these sets were plants obtained from the Continent, and probably identical in characters with those obtained by Messrs. Lawson.

(3.) Sixty thriving plants, nearly as far advanced as the last set, being the first produce of cuttings of the stems and roots of the plants sent to me last summer by Dr. Gunning, of Rio Janeiro, direct from Brazil.

(4.) One hundred and fifty younger plants, being a second set from the same stock, obtained from cuttings of the last set No. 3.

The plants of No. 3 and No. 4 present some differences in their form from those of the same ages of Nos. 1 and 2, as well as from those cultivated by Messrs. Lawson. It is probable that these differences depend on mere variety only. Several varieties of true ipecacuan root, besides spurious ones, are known in trade, especially on the Continent, and it is reasonable to infer that the several varieties of true root, which seem all equal in energy, may be the produce of corresponding varieties in the true species of plant.

It is unnecessary to state that great care must be taken in choosing the true species, and if possible, the best variety of it, for culture in India. On this point I have to observe that there can be no doubt of the genuineness of the plants sent by Dr. Gunning. The most elaborate description and best defined drawing of the plant as observed in Brazil are those of Von Martins, in his "Specimen Materiæ Medicæ, Brasiliensis, 1824," re-printed from the ninth volume of the transactions of the Bavarian Academy of Sciences. In this treatise the author has described and figured also the several plants and roots of the spurious ipecacuans—an addition which gives facility and accuracy to the diagnosis. The plants sent by Dr. Gunning corresponded, so far as their characters were shown, precisely with the description and figure of Von Martins, and so do all the young plants, without exception, which have been raised from them. I also found the roots of Dr. Gunning's stock plants to be absolutely identical, in their rather remarkable characters, with the finest ipecacuan root of our shops. Mr. Macnab, therefore, proposes to confine for the present the further multiplication of plants to Dr. Gunning's stock. It is quite possible, however, that, in the progress of the plants to maturity, the differences in character now observable may so far disappear as to indicate variety unimportant in reference to the object of their culture.

It was Dr. Anderson's hope and intention to return to India in January next, by which time a considerable consignment of plants might have accompanied him. His illness, however, has been so severe, and not long ago even dangerous, that it is impossible for him to go out so soon. But both Mr. Macnab and Messrs. Lawson's Superintendent state that the plants will gain in hardiness and endurance of transport by more mature growth in their present situation.

At all events it will be a matter of great importance that they be not sent out to India except in custody of some skilful person, who will either see them to their actual destination there, or consign them into trusty hands on arriving at an Indian port.

From H. MERIVALE, ESQ., C. B., Under Secretary of State for India, to DR. THOMAS FARQUHAR,—dated India Office, London, the 10th November 1870.

I AM directed by His Grace the Secretary of State for India in Council to refer to the representations made by you some time since to His Excellency the Governor General in Council and to this Department as to the importance of introducing into India a sufficient number of ipecacuanha plants in order to establish that valuable medicine as one of the products of that country, and to inquire whether you are ready to undertake the duty of arranging with the authorities at the Royal Botanical Gardens at Kew and at Edinburgh in regard to such of the plants at those places as may be fit to be moved at the time that your stay in this country is completed, and of conveying them to the Botanical Gardens at Calcutta.

This duty had been entrusted to the late Dr. Anderson, Superintendent of the Botanical Gardens at Calcutta, but the lamented death of that officer obliges His Grace to make other arrangements.

The number of plants at Kew is not believed to be large; but Dr. Anderson had, with the help of Dr. Christison, of Edinburgh, the authorities of the Botanical Gardens, and Messrs. Lawson, succeeded in collecting a considerable number of plants (now over 600) in different stages of growth. Some of these will be fit for removal at the beginning of next year.

Dr. Christison is in communication with the Secretary of State in regard to them; and, should it appear that a sufficient number of plants could properly be removed by the time of your departure for India, the Secretary of State in Council will grant you the sum of £50 in consideration of the trouble and expense which you will have in visiting Edinburgh and safely conveying the plants from that place to Calcutta.

By the enclosed letter from the late Dr. Anderson you will observe that, should it be expedient to remove any of the plants which are not yet fit for so long a voyage as that to Calcutta, Dr. Hooker is kindly willing to receive them at Kew, whence there will probably be more opportunities of getting them safely transported to Calcutta; but this is a matter which, with the other details, should you accept the commission, you will arrange in communication with the Revenue Department of this Office, with which you are instructed to place yourself in communication.

I transmit also a printed copy of the report made by Dr. Christison.

From H. MERIVALE, ESQ., C. B., Under Secretary of State for India, to Dr. CHRISTISON,—dated India Office, London, the 10th November 1870.

I AM directed by His Grace the Secretary of State for India in Council to acknowledge the receipt of your letter of the 25th ultimo, in which you inform him of the serious illness of Dr. Thomas Anderson, Superintendent of the Botanical Gardens at Calcutta, and entrusted in this country with the duty of collecting and despatching to Calcutta plants of ipecacuanha in order to establish that valuable medicine as one of the products of India. At the request of that officer you also report on the number and condition of the plants now in the Royal Botanical Gardens at Edinburgh and at Messrs. Lawson's nursery.

Since the receipt of your letter His Grace has learned with very great regret that Dr. Anderson's illness had resulted in his death. Apart from the other merits and qualifications of this able and zealous officer, his loss will be very much felt in regard to this experiment, in which he had taken such a deep interest. But, sensible as the Duke of Argyll is of the difficulty of supplying Dr. Anderson's place in this matter, he hopes that the progress which, with your aid and that of the authorities of the Botanical Gardens at Edinburgh and Kew, and of Messrs. Lawson, he had been enabled to make in obtaining plants has been so great that the chief difficulty is now in the safe conveyance of such as may be ready to Calcutta, and he hopes shortly to make a satisfactory arrangement for that purpose. When that is completed, you will be again addressed from this Department.

I am further to express to you the thanks of the Secretary of State in Council, not only for the interesting report which you have made upon these plants, but also for such of them—and those on account of their undoubted genuineness the most valuable—as you took the trouble to procure from Dr. Gunning, of Rio Janeiro.

I am also to ask you to convey His Grace's thanks to Mr. Macnab and Messrs. Lawson for the services which they have rendered in taking care of and increasing the number of plants.

A copy of your report will be transmitted to the Government of India.

From Her Majesty's Secretary of State for India, to the Government of India,—No. 75, dated India Office, London, the 22nd December 1870.

In continuation of my despatch No. 69, dated the 16th ultimo, I forward to you herewith a copy of further letters which have been received from Dr. Christison, and of the reply which I have caused to be addressed to him. I also forward a copy of a letter from Dr. Farquhar begging to decline the charge of conveying the plants to India.

2. The letter to Dr. Christison will explain my decision upon the points submitted to me.

3. With respect to the terms on which Messrs. Lawson have given trouble and attention to the cultivation of the plants with them, the Inspector General of Forests should be directed to send to them a "good allowance" of fresh deodar seed according to their request.

From R. Christison, Esq., to Her Majesty's Under Secretary of State for India,—dated Edinburgh, 40, Moray Place, the 26th November 1870.

Since receiving your letter and queries respecting the ipecacuan plants under cultivation in the Royal Botanic Garden and in Messrs. Lawson's nursery, I have several times considered with Mr. Macnab the question of the transport of the plants to India; and two days ago I had also the advantage of the opinion of Dr. Farquhar, of the India Medical Service, who had much to do with suggesting to the Government at Calcutta the introduction of the ipecacuan culture.

The result is that both Dr. Farquhar and I concur with the opinion of Mr. Macnab, that it would be hazardous to remove the plants in the winter season; that the most advisable course is to wait till the beginning of June, so as to secure them against exposure to cold in this country; and that they will thus arrive at the most favorable season for transport up-country in India, *viz.*, when the dry heats are over, and the wet season begins. The reason for this preference is, that not only Marcgrav and Riso, who first described the ipecacuan plant in 1648, but likewise every successive Brazilian traveller who has noticed the subject, represents the plant to grow in a damp atmosphere under the shade of woods and exposed to full tropical heat. It is also, under conditions equivalent to these that their cultivation has proved eminently successful equally in the Botanic Garden and in Messrs. Lawson's hands.

If the botanical and horticultural advisers of the Council for India adopt Mr. Macnab's suggestions, it is time enough to settle what precautions should be taken for securing the transmission of the plants to their ultimate destination when the period of their departure approaches. It is evident from Mr. Macnab's experience of the transmission of plants by sea, and that of Dr. Farquhar as to the transport up-country in India, that, although they prove very hardy in our stoves, and even stood the voyage hither from Brazil well, various precautions will be necessary both on the voyage to Calcutta and on the journey into the interior by the Indian railways.

I beg to add that Mr. Macnab sees no reason whatever why such plants as were received last July from Rio Janeiro should not be shipped thence direct to Calcutta. He even thinks they might very well be at once forwarded hence for multiplication in India, should any further consignment arrive here from Dr. Gunning. I will gladly learn what the opinion of the advisers of the Council is on that question, and will write in conformity with it to Dr. Gunning. I have been expecting for some time a further arrival of plants from him, and ought to write to him soon that no others have come since his first consignment four months ago.

I have had a conversation with Mr. Charles Lawson, junior, of the Messrs. Lawsons' firm, about the footing on which they have been cultivating their plants for Government; and he informs me that his firm understand they are doing so on the usual footing of exchanges, and that they will be very glad to receive, in exchange for their plants, "a good allowance" of deodar seeds.

From R. Christison, Esq., to C. B. Phillimore, Esq.,—dated Edinburgh, the 15th December 1870.

Another consignment of ipecacuan plants from Dr. Gunning, of Rio Janeiro, arrived at the Botanic Garden here yesterday afternoon, and I have examined them this morning with Dr. Balfour and Mr. Macnab.

A box with mould contained a few plants in good condition for multiplication by cutting. Had they been numerous enough, Mr. Macnab would have proposed to send the box off to India at once. But unfortunately the plants are too few in number, and Mr. Macnab is persuaded, from various circumstances, that the box must have been tampered with, and that it had contained many more. He proposes, therefore, to retain these plants for multiplication here.

There came also, at the same time, a large paper parcel of roots and stems, probably a hundred plants altogether. Had they been put simply into the box with the mould, they would have arrived fit for multiplication; but packed as they were, they have dried up merely into good pharmaceutical specimens without vitality.

No letter has come in explanation, but I shall write by the first post to Dr. Gunning and tell him the result of his second attempt to supply us.

The nursery of growing young plants continues to thrive excellently.

From H. Merivale, Esq., Under Secretary of State for India, to R. Christison, Esq.,—dated India Office, London, the 20th December 1870.

I am directed by His Grace the Secretary of State for India in Council to acknowledge the receipt of your letter of the 26th ultimo, on the subject of the ipecacuan plants now under cultivation at Edinburgh in the Royal Botanic Garden and the Nursery of Messrs. Lawson, and reporting the result of a consultation which you had held with Mr. Macnab and Dr. Farquhar as to the best time of removing the plants to India. An additional intimation, dated the 15th instant, of the arrival of a further supply from Dr. Gunning has also been received at this Office from you.

In reply, I am to inform you that, under the representations made by you, His Grace is quite satisfied that the plants should not be removed from Edinburgh until the end of March or beginning of April so as to reach Calcutta in June—the time decided upon at your consultation with the above-named gentlemen. You will have learned from Dr. Farquhar that he has been forced to decline the charge of conveying the plants to India, and, therefore, some other arrangement will be necessary. Should there be no person returning to India to whom the charge of the plants could be safely consigned, it seems to the Duke of Argyll that they might, if properly packed in cases, be despatched in safety from Glasgow or Liverpool through the Suez Canal to Bombay, and thence sent overland to Calcutta. The Secretary of State quite agrees that any further consignments from Rio might now be sent off direct to India as your letter proposes, and he regrets to learn that the last box has been so tampered with that that course cannot be taken with it.

With respect to your account of the footing on which Messrs. Lawson are cultivating the plants they possess for the Government, it accords entirely with what the department had understood to be the arrangement with Dr. Anderson, and the Government of India will be directed to transmit to Messrs. Lawson such a quantity of deodar seeds as they request.

I am not to conclude without again asking you to accept the the hearty thanks of the Secretary of State in Council for the kind and disinterested manner in which your love of science has led you to render your assistance to the department in this matter. I am also to ask you to convey to Dr. Balfour and to Mr. Macnab the acknowledgments of the Secretary of State for the successful attention which they have so zealously given to the introduction of this important plant into India.

From Surgeon-Major T. Farquhar, M. D., to Her Majesty's Under Secretary of State for India,—dated 16, Rubislaw Terrace, Aberdeen, the 30th November 1870.

In reply to your letter of the 10th November, referring to ipecacuan plants for India, I beg first to acknowledge with thanks the proposal that I should be deputed to convey them to Calcutta.

I beg, however, that I may be allowed to decline the duty, for which a suitable man may, I trust, be very readily found.

Since seeing you on the subject in London I have visited Edinburgh, where I had the pleasure (along with Dr. Christison and Dr. Macnab) of seeing the plants in the Horticultural Gardens, and of going over the questions as to the season and plans most suitable for their removal to India.

Several facts in regard to the plants struck me as interesting.

First.—They are in a most satisfactory and, indeed, flourishing state in the Edinburgh Gardens under Mr. Macnab's care.

Second.—This opinion should be accepted as final that they should not be removed till spring, but allowed to remain in Edinburgh that they may go through a system of hardening.

Third.—Mr. Macnab clearly demonstrates the most acceptable fact that the ipecacuan plant can be readily multiplied by cutting up the fresh roots into small pieces, which readily bud.

It therefore appears that, instead of considerable expense being incurred in securing plants, and transmitting them in expensive cases across the sea, many hundreds of them can be raised from a few pounds of fresh roots.

The Edinburgh plants that will be ready for shipment in spring should, however, still be sent, for, on being forwarded to different parts of India, it will at once be seen in what localities, and under what conditions, root plants are most likely to thrive.

It would be likewise of the first importance that some of the natives of India should be interested in the subject of the cultivation of the plant, so that it may become, at as early a date as possible, a commercial commodity, and find its way into every bazaar in the country.

P. S.—On reading over Dr. Christison's letter as to the season of the year at which the plants should be sent to India, I beg to say that, in talking over the matter in Edinburgh, I meant him to understand that the beginning of June would be the best month in which the plants should *arrive* in India.

This would lead to their being despatched from this country in the end of March, which would give them a more favourable season for their passage through the Red Sea.

Extract from the Proceedings of the Government of India in the Department of Agriculture, Revenue, and Commerce,—Nos. 21-23 (*Agriculture and Horticulture*), *dated Simla, the 29th June* 1871.

READ again—

Secretary of State's despatch No. 75 (Public), dated the 22nd December 1870, regarding the transmission of a number of ipecacuanha plants to India.

Circular from the Home Department, to the Local Governments and Administrations, forwarding copy of the above despatch, No. 577—86, dated 31st January 1871.

Read also—

Letter from the Home Department, in continuation of the above circular, to the Governments of Madras and Bombay, Nos. 2014 and 2015, dated 24th April 1871.

From the Government of Bengal, No. 647, dated the 3rd March 1871.

From the Government of the North-Western Provinces, No. 369 A, dated the 24th March 1871.

From the Government of Bombay, No. 1412, dated the 31st May 1871.

From the Government of Fort St. George, dated the 7th June 1871.

OBSERVATIONS.—In the despatch above-cited the Secretary of State informed the Government of India that he had decided to send out the ipecacuanha plants which had been collected at Edinburgh, so as to reach Calcutta in June, or that, failing a proper person to take charge of them to Calcutta, they would be sent to Bombay *vid* the Suez Canal.

2. In anticipation of the arrival of the plants, the Governments of Bengal and the North-Western Provinces were asked to submit reports from the Superintendents of the Botanical Gardens at Calcutta and Saharunpore as to the localities best suited to the plant, and the Governments of Madras and Bombay were afterwards asked to state if it could be cultivated on the Nilgiris and the Mahabaleshwar Hills, respectively.

3. Mr. Clarke, Acting Superintendent of the Calcutta Botanical Gardens, proposed as a fit place the Bhanum Pookree spur close to the main road between Silligori and Pankabari and in the Sikkim terai. Dr. Jameson, Superintendent of the Saharunpore Botanical Gardens, thinks that nowhere in the North-Western Provinces would the plant succeed.

4. The Government of Bombay forwards a report from the Superintendent of the Botanical Gardens, suggesting that the cultivation should be attempted at Mahabaleshwar under the superintendence of the Assistant in charge of the Cinchona Plantation at Lingmulla. He also recommends the introduction of rhizomes direct from Brazil, so timed as to reach Bombay in June. The Government of Bombay asks whether, if the plants arrive *vid* Bombay, any portion of the consignment can be stopped for trial at Mahabaleshwar.

5. The Government of Madras forwards a brief note from Mr. McIvor, stating that he considers the high plateau of the Nilgiris too cold for the successful cultivation of the plant. But he is of opinion that in well selected places, and at elevations not exceeding 4,000 feet, the plant may be successfully grown in those hills.

6. It is not exactly known how many plants may be expected, nor has any intimation yet been received of their despatch. It is advisable, however, with a view to their probable early arrival that the places for the experimental cultivation should at once be decided. And it seems to the Governor General in Council that the Sikkim terai, the lower slopes of the Nilgiris, and Mahabaleshwar, present a fair prospect of success. Accordingly, on the arrival of

the plants, they should be distributed in three equal portions between these places. The Governments of Bengal and of Bombay will, therefore, be requested to effect in this sense an equal distribution according as the plants arrive at Calcutta or Bombay.

ORDER.—Ordered, that a copy of these remarks be forwarded to the Governments of Madras, Bombay, and Bengal, for information and guidance.

From Her Majesty's Secretary of State for India, to the Government of India,—No. 18, dated India Office, London, the 31st May 1871.

IN continuation of my despatch of the 22nd of December last, No. 75, on the collection of ipecacuanha plants for transmission to Calcutta, I have to inform your Excellency in Council that I have determined to avail myself of the return to Bombay of Mr. W. Walton, of the Cotton Department of that Presidency, to forward a small Wardian case containing from 25 to 30 ipecacuanha plants, which have been got ready for the voyage out of the stock now at the Royal Botanical Gardens at Edinburgh.

2. Mr. Walton, who leaves Southampton for Bombay on the 17th of June, and is willing to take charge of this case, is accustomed to the charge of similar plants. Should he succeed, as he hopes to do, in conveying the plants safely, they will arrive in India at a favorable time. They will be transmitted from Bombay by Railway to the Superintendent of the Botanical Gardens at Calcutta, and special injunctions should be given to the Railway functionaries to be careful of the case during its transit.

3. I shall address His Excellency the Governor of Bombay on this point.

4. The risk of the destruction of the plants through the heat of the passage down the Red Sea from June to the end of September is so great that I have informed Dr. Balfour that I do not purpose sending any further quantity of these plants until October next.

From J. GEOGHEGAN, ESQ., Under Secretary to the Government of India in the Department of Agriculture, Revenue, and Commerce, to the Secretary to the Governmentof Bombay,—No. 50, dated Simla, the 8th July 1871.

IN continuation of the Resolution in this Department, No. 22, dated 29th ultimo, and with reference to the despatch from the Secretary of State, to the Government of Bombay, No. 42, dated 31st May last, I am directed to request that on its receipt the Wardian case containing the ipecacuanha plants sent out from England may be sent on as soon as possible to the Superintendent of the Botanical Gardens at Calcutta without removing any of the plants. As only 25 or 30 plants have been sent, and are arriving later than was intended, the Governor General in Council is of opinion that they should be planted out in the Sikkim Terai, which seems to be the most favorable locality for them.

From GEORGE KING, ESQ., M. B., Superintendent, Botanical Garden, Calcutta, to the Officiating Under Secretary to the Government of Bengal,—No. 420, dated Botanical Garden, the 21st July 1871.

WITH reference to the endorsements marginally noted, I have the honor to report, for the information of His Honor the Lieutenant-Governor, that a Wardian case containing twelve plants of ipecacuanha has been received at this garden. The case was brought to Bombay under the care of Mr. W. Walton, and from thence forwarded to Calcutta by railway.

General Department, General No. 2047 of 14th July 1871.
General Department, General No. No. 1965 of 8th July 1871.

The condition of the plants is highly satisfactory, and is most creditable to Mr. Walton. They all present a healthy appearance, and have apparently suffered but little in transit from England.

I propose to keep them here for a short time, so that they may get well established, and then to forward them to Sikkim under the care of a competent person.

No. 2205, dated Fort William, the 27th July 1871.

Endorsed by the Government of Bengal.

COPY forwarded to the Under Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce, with reference to his letters Nos. 23 and 51, dated, respectively, 29th ultimo and 8th instant.

From J. GEOGHEGAN, ESQ., Under Secretary to the Government of India in the Department of Agriculture, Revenue, and Commerce, to the Secretary to the Government of Bombay,—No. 102, dated Simla, the 18th August 1871.

IN continuation of this Office letter No. 50, dated 8th ultimo, I am directed to forward copy of a communication from the Government of Bengal, No. 2205, dated 27th idem, reporting that a Wardian case containing twelve ipecacuanha plants sent out from England under the care of Mr. Walton, has been safely received at the Botanical Gardens, Calcutta, and to request that the thanks of the Government of India may be conveyed to Mr. Walton for the care he bestowed upon the plants during their transit.

Statement of Rain-fall and Agricultural Prospects in Bengal, Bombay, Punjab, Central Provinces, Oudh, Mysore, Coorg, Central India, Sindh, and Berar.

No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Rain-fall for week ending		Date of despatch from Local Government or Administration.	State of Agricultural Prospects.	Remarks by Local Government or Administration.
				Inches.	Week ending	Inches.			
1	Bengal	Bhaugulpore	August 4	.....	August 5	2·6	August 7	Janerah gone; Rice very good.	
		Monghyr	,, 5	.....	,,	2·1	,,	Bhadoi much injured; Amun excellent.	
		Purneah	July 28	.....	,,	4·	,,	*	* Will be furnished hereafter by the Collector.
		Rajmehal	August 5	.....	,,	2·	,,	Bhadoi on the Dearahs nearly destroyed; Amun good.	
		Deoghur	,,	.....	,,	5·8	,,	Favorable. Heavy rain destroying Sugar-cane and Janerah.	
		Nya-Doomka	,,	.....	,,	2·7	,,	Rice very promising; Indian-corn damaged by rains.	
		Pakour	,, 16	.....	,,	3·4	,,	Same as last week.	
		Patna	,,	2·56	,,	.....	17	Rice crop doing well; Bhadoi crop much injured by late rains and floods.	
		Gya	July 29	.....	,,	2·6	7	Favorable. Bhadoi doubtful.	
		Chumparun	,,	.....	,,	·5	,,	Bhadoi crops in excellent condition.	
		Shahabad	August 5	.....	,,	1·2	,,	Rice favorable; Janerah and Murwah injured.	
		Tirhoot	July 29	.....	,,	1·8	,,	Loss of about six annas of Bhadoi crops throughout the District owing to floods and rain; Dhan may not suffer much.	
		Ditto	August 5	.....	,,	1·8	,,	Generally very satisfactory.	
		Rajshahye	July 29	.....	,,	2·2	,,	Ous generally damaged; Amun, though slightly injured, is in good condition.	
		Bograh	28	.....	,,	5·6	,,	Good.	
		Dinagepore	,, 29	.....	,,	4·4	,,	Favorable.	
		Maldah	,, 28	.....	,,	2·9	,,	Good, except in Thannah Kaliachak, where two annas Bhadoi crop injured by the rise of the river.	

No.	Presidency or Province	District.	Date of District Report.	Rain-fall for fortnight preceding.	Rain-fall for week. Week ending	Rain-fall for week. Inches.	Date of despatch from Local Government or Administration.	State of Agricultural Prospects.	Remarks by Local Government or Administration.
	Bengal, *concluded* ...	Moorshedabad ...	July 29 ...	.....	August 5 ...	1·8	August 7 ...	Good, but danger apprehended from inundation. Some injury done by it.	
		Pubna ...	„ ...	.....	„ ...	3·2	„ ...	Six annas Ous damaged by the rise of rivers; Amun still very promising.	
		Ditto ...	August 5 ...	.....	„ ...	10·8	„ ...	Ditto ditto ditto.	
		Burdwan ...	„ 16 ...	Sufficient	„ ...	.....	„ 17 ...	Prospects good. Partial damage by overflow of Damuda and Bhaguruthee.	
		Bancoorah ...	„ 5 ...	.....	„ ...	3·7	„ 7 ...	An unprecedentedly rich harvest of rice is expected if it rains in September.	
		Beerbhoom ...	„ ...	.....	„ ...	4·9	„ ...	Good.	
		Hooghly ...	July 28 ...	.....	„ ...	5·6	„ ...	All crops thriving.	
		Ditto ...	August 5 ...	.....	„ ...	3·7	„ ...	Favorable, except on low lands.	
		Howrah ...	„ ...	.....	„ ...	3·6	„ ...	Favorable.	
		Midnapore ...	„ ...	.....	„ ...	4·2	„ ...	Good.	
		Nuddea ...	„ ...	.....	„ ...	1·4	„ ...	Twelve annas Ous expected; Amun promising.	
		Jessore ...	July 28 ...	.....	„ ...	2·	„ ...	Good throughout; Ous and Indigo suffered severely in Magoorah.	
		Ditto ...	August 4 ...	.....	„ ...	3·8	„ ...	Ous being reaped; rest good.	
		Dacca ...	„ 15 ...	1·10	„ ...	...	„ 17 ...	Good.	
		Backergunge ...	July 29 ...	.....	„ ...	2·3	„ 7 ...	Favorable.	
		Furreedpore ...	„ ...	.....	„ ...	3·	„ ...	Good.	
		Ditto ...	August 5 ...	.....	„ ...	2·6	„ ...	Good.	
		Mymensingh ...	July 29 ...	.....	„ ...	6·7	„ ...	Ous very fine; Amun partly sacrificed to Jute.	
		Cachar ...	„ ...	.....	„ ...	4·6	„ ...	Ous worse; Amun good; a little more sun required for Tea.	
		Noacolly or Bullooah ...	„ 28 ...	...	„ ...	3·7	„ ...	*	* Not received, but will be submitted regularly from next week.
		Tipperah ...	„ 29 ...	...	„ ...	3·1	„ ...	Good and favorable.	
		Cuttack ...	August 16 ...	4·82	„ ...	...	„ 17 ...	Very favorable.	
		Pooree ...	July 29 ...	...	„ ...	2·5	„ 7 ...	Very fair.	
		Hazareebaugh ...	August 5 ...	...	„	3·7	„ ...	Favorable.	
		Lohardugga ...	July 29 ...	...	„	3·4	„ ...	Very good and promising.	
		Maunbhoom ...	August 5 ...	...	„	7·8	„ ...	Favorable.	
		Singbhoom ...	July 29 ...	...	„	2·9	„ ...	Favorable.	
		Durrung ...	„ ...	...	„	2·5	„ ...	Fair.	
		Nowgong ...	„ ...	...	„	7·	„ ...	Ous promising.	
		Kamroop ...	„ 28 ...	...	„	0·	„ ...	Favorable.	
		Julpigoree ...	„ ...	...	„	2·2	„ ...	Fair.	
		Gowalparah ...	„ 29 ...	...	„	·5	„ ...	Ous reaped; Salee or Amun being transplanted.	
		Garo Hills ...	„ ...	...	„	2·9	„ ...	Healthy.	
		Darjeeling ...	„ 28 ...	...	„ ...	3·6	„ ...	Hill crops thriving; others much injured by the hail-stones.	
		Cooch Behar ...	„ 29 ...	...	„ ...	*	„ ...	Good ...	* No rain guage kept.
		Lucknow ...	.....	...	July 28 ...	4·7	„ 4		
		* „ ...	August 11 ...	3·8	.....	...	„ 12 ...	In parts Rice and Kodo suffered from excess of rain, and sowing delayed. State of kharif crops not satisfactory.	The Chief Commissioner of Oudh, on the 12th August, remarks—
		„ ...	„ 16 ...	2·9	.....	...	„ 17 ...	Kharif prospects good.	Some damage from too continuous rain, but there is now a break. General agricultural prospects excellent. And on the 17th prospects excellent.
		Oonao ...	.....	...	July 28 ...	4·7	„ 4 ...	Good.	
		Barabunkee ...	.....	...	„ ...	6·3	„ ...	Kodo, Sugar-cane, and Juar crops are suffering from excess of rain.	Report of Tehsil Hydergush not received.
		Seetapore ...	.....	...	„ ...	4·9	„ ...	Favorable ...	Tehsil Seetapore report not received.
		Hurdui ...	.....	...	„ ...	4·8	„ ...	Cultivation kept back by excessive rain.	
		Kheree ...	.....	...	„ ...	3·9	„		
		Fyzabad ...	.....	...	„ ...	4·9	„ ...	Sugar-cane crops suffering from the excess of rain.	
2	Oudh ...	„ ...	August 11 ...	2·3	.....	...	„ 12 ...	Rice crops good; Juar and Kodo suffered much from excess of rain.	The Chief Commissioner of Oudh, on the 12th August, remarks—
		„ ...	„ 16 ...	5·6	.....	...	„ 17 ...	Sugar-cane good; Jarhan being transacted; Wheat lands ploughed.	Some damage from too continuous rain, but there is now a break. General agricultural prospects excellent.
		Baraich ...	.....	...	July 28 ...	2·7	„ 4 ...	Kharif crops have almost everywhere germinated.	And on the 17th prospects excellent.
		Gonda ...	.....	...	„ ...	4·2	„ ...	.....	Report of Tehsil Begumgunj not received.
		Rai Bareilly ...	.....	...	„ ...	3·3	„ ...	Aghani very much behind-hand; Paddy favorable.	
		Sultanpore ...	.....	...	„ ...	4·2	„ ...	Much rain, but no serious injury done yet, excepting along the River Goomti.	
		Pertabgurh ...	.....	...	„ ...	3·7	„ ...	Crops are thriving well, fields are being prepared for showing Bajra and Mothi.	

No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Rain-fall for week. Weekending	Rain-fall for week. Inches.	Date of despatch from Local Government or Administration.	State of Agricultural Prospects.	Remarks by Local Government or Administration.
3	Mysore	.....	.....	...	July 29 ...	·45	August 7 ...	Generally good, but the want of seasonable rain is everywhere felt, and affects the young crops on the high lands injuriously.	
	"	.....	August 15 ...	2·5	.....	...	" 16 ...	Improved	Deficient rain till within past three days.
4	Coorg	.....	.....	...	July 29 ...	8·42	" 7 ...	Very good.	
	"	.....	.....	*	.....	...	" 16 ...	Crops in good condition	* Not reported.
5	Central India Agency.	Indore ...	.....	...	July 22 ...	1·9	" 1 ...	Favorable.	
		Bhopal—Sehore ...	.....	...	" ...	9·7	" ...	Good	Previous rain-fall 17 inches.
		Gwalior ...	.....	...	" ...	6·	" ...	Favorable.	
		Bundelcund—Nowgong ...	.....	...	" ...	5·6	" ...	Ditto	Previous rain-fall 15 inches.
		Western Malwa. Augur ...	.....	...	" ...	2·4	" ...	Good	Previous rain-fall 1·5 inches.
		Western Malwa. Mehidpore ...	.....	...	" ...	4·37	" ...	"	Previous rain-fall 3·16 inches.
		Western Malwa. Rutlam ...	.....	...	" ...	3·96	" ...	"	Previous rain-fall 3·09 inches.
		Deputy Bheel Agency. Maunpore ...	.....	...	" ...	1·07	" ...	"	
		Deputy Bheel Agency. Bagode ...	.....	...	" ...	2·06	" ...	"	
		Deputy Bheel Agency. Burwanee ...	.....	...	" ...	·06	" ...	"	
		Deputy Bheel Agency. Jamnia ...	.....	...	" ...	·04	" ...	"	
		Deputy Bheel Agency. Khull ...	.....	...	" ...	·09	" ...	"	
		Bheel Agency. Sirdarpore ... 14th to 18th July 1871 ...	.....	...	" ...	1·79	" ...	Fair	Previous rain-fall 10·07 inches.
6	Sindh ...	Thurr and Parkur ...	.....	...	*	†	.....	Unfavorable for want of rain ...	* From 1st to 15th July 1871. † The fall of rain in May last encouraged the people to cultivate small patches of ground in anticipation of a favorable season. Since then no rain has fallen. The people are disappointed, and the young plants, for want of water, are perishing. Famine expected.
		Hyderabad ...	August 15 ...	0·49‡	.....	...	August 17 ...	Prospects good, but rain wanted in high-lying Districts.	‡ Total fall during the year 3·20. Inundation of the Indus 16 feet 9 inches. Inundation favorable to agricultural prospects.
7	Berar ...	Omrawottee ...	.....	14	.....	...	" 16 ...	Cotton and Grain prospects good.	Rain is much wanted; unless there are a few heavy showers soon, there will be a considerable falling off in the outturn of autumn crops. Weather continues cloudy, and rain seems imminent. Public health good; cattle disease prevalent in some parts.
		Akola ...	.....	...	.....	...	" ...	.....	
8	Central Provinces	Nagpur ...	August 12 ...	2·6	.....	...	" ...	Jawari sowings slightly delayed. Transplanting rice nearly finished. Prospects generally good. Cotton in Wurdha favorable.	
		Jabalpur ...	" ...	10·5	.....	...	" 17 ...	Prospects excellent.	
		Hoshangabad ...	" 5 ...	7·3	.....	...	" ...	Heavy rain, but crops uninjured. Generally favorable. Cotton slightly injured in Nursingpur.	
		Raipur ...	" ...	3·6	.....	...	" ...	Kharif crops generally good, with little damage from continual rain.	

No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Rain-fall for week. Week ending	Rain-fall for week. Inches.	Date of despatch from Local Government or Administration.	State of Agricultural Prospects.	Remarks by Local Government or Administration.
			Fortnight ending August 16		.....	...	August 17 ...	Crops good	The Lieutenant-Governor remarks on 17th August—
9	Punjab	Umballa ...		7·9					Rain generally wanted in Districts west of the Sutlej. East of the Sutlej and in the Jullundhur Doab, the agriculture prospects are decidedly good. * In the city during the fortnight previous.
		Jullundhur	"	1·2	.....	...	.....	Crops generally flourishing.	
		Lahore ...	"	*Nil.*	.....	...	.....	Crops on unirrigated lands want rain. Baree Doab Canal water too has been stopped.	
		Mooltan	"	"	.....	...	.....	Crops on unirrigated lands want rain.	
		Rawul Pindee ...	"	3·5	.....	...	.....	Crops flourishing.	
		Ahmedabad ...	" 15	17·6*	.....	...	August 17 ...	Prospects good ...	
		Dharwar ...	" 16	1·39	.....	...	" ...	Crops throughout most of the District withering, and sowing operations retarded from want of rain.	
		Kaira ...	" 15	·16	.....	...	.....	Very heavy floods from 3rd to 8th. Prospects of an abundant harvest.	
10	Bombay	Khandeish ...	" 17	2·68	.....	...	.....	Prospects bad.	
		Poona—4 Western Districts ...	" "	5·37	.....	...	.....	Crops generally good. Prices risen slightly.	
		" —4 Eastern Districts	" ...	0·22	.....	...	.....	Rain very scanty. Sowing at a standstill. The few growing crops not promising. Grain dear. Prices rising.	

GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., cap. 67.

The Council met at Simla on Tuesday, the 15th August 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding*.

The Hon'ble John Strachey.

The Hon'ble Sir Richard Temple, K. C. S. I.

The Hon'ble J. Fitzjames Stephen, Q. C.

The Hon'ble B. H. Ellis.

Major-General the Hon'ble H. W. Norman, C. B.

The Hon'ble F. R. Cockerell.

The Hon'ble R. E. Egerton.

His Highness Sarámade Rájáhée Hindústán Ráj Rájendra Srí Mahárájá Dhiráj Sivái Rám Sing Bahádur, of Jaypúr, G. C. S. I.

His Highness the Mahárájá of Jaypúr made a solemn declaration of allegiance to Her Majesty, and that he would faithfully fulfil the duties of his office.

INDIAN TARIFF ACT (AMENDMENT) BILL.

The Hon'ble SIR RICHARD TEMPLE, in moving for leave to introduce a Bill to amend the Schedule of the Indian Tariff Act, 1871, said that the necessity for legislation had arisen in the following manner: The Indian Tariff Act, 1871, imposed an *ad valorem* duty of one per cent. on the export of indigo. Their French neighbours at Pondicherry had evaded this tax by exporting indigo leaf (on which no duty at present was levied) to Pondicherry, where, on reaching the factories, it was manufactured into indigo; and since the French Government levied no duty on exported indigo, the French manufacturer obtained a slight advantage over those who exported from British territory. This state of things naturally gave rise to complaints, and the present Bill was intended to remedy an admitted hardship, by imposing a duty on indigo leaf, and thus placing the French and English manufacturer on a footing of equality.

The Motion was put and agreed to.

INDIAN WEIGHTS AND MEASURES OF CAPACITY BILL.

The Hon'ble MR. STEPHEN moved for leave to introduce a Bill to regulate the Weights and Measures of capacity of British India. He said that the Bill had been placed in his hands, not because he was in any way especially familiar with the subject, but under somewhat peculiar circumstances, of which it was right that he should inform the Council. His Excellency the President having signified to the Council the disallowance of the Weights and Measures Act passed last year, it was right that the grounds of that disallowance should be publicly known, and that it should be understood that there was not any difference of opinion as regarded matters of principle between the Secretary of State and those with whom this measure had originated. All parties were

agreed as to the great desirability of establishing an uniform standard of weights, and it was unnecessary to repeat the instances brought forward by Colonel Strachey last year to show the confusion and inconvenience to which the existing diversity of standards in various parts of the country at present gave rise. The Act, however, had gone somewhat beyond the original scheme in dealing with measures of length, and the Secretary of State had, in the exercise of that abundant caution which such a matter demanded, shrunk from sanctioning a measure which might seem in any manner to interfere with the existing customs and tastes of the people. If any such result was likely to ensue, the Government of India entirely concurred that it was too high a price to pay for any conveniences and advantages which the Act might have secured. The difference between the Government of India and the Secretary of State was, accordingly, one of degree rather than of principle; and, since it had been resolved to postpone the passing of the measure in its entirety, the course proposed was to re-enact those parts of the Act as to which no difference of opinion existed. This would precisely carry out the views of the Secretary of State, those provisions which he considered undesirable being omitted. This was the object of the present Bill. It was believed that the introduction of a recognized standard of weights and measures would offend no existing custom, and would gradually make its way among the people as the advantages of uniformity on such a subject came to be generally appreciated. The Railway and other great Companies had already adopted an uniform standard, and, he believed, that, in no long time, the people at large would spontaneously follow their example. On these grounds he hoped that leave would be given.

His Excellency THE PRESIDENT said—"As the Indian Weights and Measures Act of 1870 has been disallowed by Her Majesty, and will, from the date of this my signification of that disallowance, cease to have any legal validity, I wish to say a few words as to the position of the Government of India with reference to it, and to the measure by which it is contemplated to replace it. It never was the intention of the Government to force any measure on the public against the wishes and tastes of the community at large. Those who proposed the original measure did not intend that such of its provisions as were other than permissive should come into operation till it appeared that the public mind was ready to accept them. I am well aware that the forcible introduction of a measure of this sort, before the public was alive to its advantages, might be calculated only to defeat the hopes and intentions of those who advocate it. The Government of India has never had any intention of attempting any such forcible introduction. I trust, however, that the present disallowance of the measure will not have the effect of indefinitely postponing what I believe to be a most useful reform; but that the Bill, for the introduction of which leave is now asked, will practically lay the foundations of a system of uniform weights and measures throughout the empire. The Railway Companies have shown that they are anxious to second the Government in the attempt to introduce the new system, and I hope that the present Bill will be found to arm Companies, Municipalities and other bodies with adequate powers to facilitate the gradual and permissive adoption of a system which I believe to be likely, at no distant time, to conduce to the public convenience."

The Motion was put and agreed to.

CRIMINAL TRIBES BILL.

The Hon'ble MR. STEPHEN also presented the Report of the Select Committee on the Bill for the Registration of Criminal Tribes and Eunuchs.

The Council adjourned to Tuesday, the 29th August 1871.

H. S. CUNNINGHAM,
Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

SIMLA;
The 15th August 1871.

No. 32 **of 1871.**

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, AUGUST 26, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

Non-Subscribers to the GAZETTE *may receive the* SUPPLEMENT *separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.*

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA *is required by Law, of which it has been customary to publish in the* CALCUTTA GAZETTE, *will be included in the* SUPPLEMENT. *For such Orders and Notifications the body of the* GAZETTE *must be looked to.*

GOVERNMENT OF INDIA.

FOREIGN DEPARTMENT.

Discovery of a Coal Mine in the Territories of His Highness the Nizam.

From C. B. SAUNDERS, ESQ., C. B., Resident at Hyderabad, to the Secretary to the Government of India, Foreign Department, with Governor General,—No. 8, dated Hyderabad Residency, the 3rd July 1871.

I HAVE the honor to forward, for the information of His Excellency the Viceroy and Governor General of India, the accompanying translations of correspondence* with His Highness the Nizam's Minister regarding the discovery recently of a coal mine in His Highness's territory.

* No. 1510, dated 8th May 1871, with enclosures, from His Highness the Nizam's Minister.
No. 1727, dated 25th May 1871, with enclosures, from ditto ditto.
No. 1254, dated 26th May 1871, from the Resident, to Minister.
No. 1828, dated 2nd June 1871, from the Minister, to Resident.

2. The subject was first brought to my notice by the Officiating Collector, Kistna District, under orders of the Madras Government, on information received by that officer from an inhabitant of His Highness's territory, with samples of coal from a locality, which was roughly indicated as lying in the Oraganti Sircar, about 224 miles from Juggiapet and 96 miles from Budrachellum, forming a waste of 32 miles in circumference. The Collector also forwarded to me one of the specimens referred to, which was undoubtedly genuine coal, and stated that his informant asked for a reward of Rs. 2,000 to show the place where the specimen was found, and where it was said to lie near the surface in great quantities; the present specimen having been obtained about three feet from the surface.

3. I immediately brought the matter to the notice of His Highness the Nizam's Minister for his favourable consideration, with the remark that it would be for him to determine whether he would be prepared to offer the informant so large a sum as Rs. 2,000, which exceeded the reward offered by the British Government for similar information by Rs. 1,000,

without taking the precaution of depositing the reward with a third party, to be paid only in the event of the area occupied by the coal being sufficiently extensive and near the surface to enable its being worked with advantage.

4. From the Minister's reply, No. 1510 of the 8th May 1871, it appeared that he was fully alive to the importance of the discovery of coal in His Highness's dominions, enquiries having been already set on foot by him, and an officer of His Highness's Government specially detailed on this duty, and that the Tehseeldar of Talooka Kandeecondah in the Khammumet Sircar had already obtained information of the existence of a coal mine in his talooka, which he was about visiting personally and reporting upon fully. The Minister, however, liberally agreed to the large amount of reward asked by the informant of the Collector of the Kistna District, provided the coal mine he spoke of was an entirely distinct and separate one from that which the Tehseeldar above mentioned was going to visit and examine. The Collector was informed accordingly, and was requested to direct his informant to take steps for pointing out the coal mine spoken of by him.

5. In the meantime, the Tehseeldar of Kandeecondah having visited the coal mine of which he had received information from other sources, submitted a detailed and interesting report, accompanied with several specimens of coal from it. This report is attached to the Minister's note No. 1727, dated 25th May 1871, and will be found among the translations accompanying this letter. It describes the coal mine as situated in the rocky bed of the forest stream called Goondralawag, which, flowing from the border of Dewurlah towards Goondral, in the Talooncha Estate, falls into the Godavery River. The coal is reported to crop out and lie very near the surface and on the bank of the river in large masses or heaps, where the Tehseeldar had caused the bed of the river to be dug, a stratum of coal was found so near as one yard below the surface occupying a space of 10 yards. He also traced a vein of coal extending along the bank of the stream to a distance of a quarter of a mile. The report gives further interesting details, and judging from those details and from the specimens of coal produced, there seems to be no doubt of the discovery of a real and extensive coal mine. With a view to its being worked and utilized hereafter, the Minister has given orders for the locality to be visited and examined by a competent and experienced person; but it is to be regretted that the coal viewer, Mr. Coulson, whose services he obtained about a year ago from England, died a short time since.

6. The Tehseeldar of Kandeecondah, Mahomed Ibraheem Ali Khan, it will be seen from the Ahkam or instructions issued by the Minister on this subject, is not only to receive the liberal reward of Rs. 2,000 from His Highness's Government, but also to obtain promotion to a higher grade in his department, in consideration of his zealous and successful exertions in the explorations for coal in His Highness's territory.

7. In conclusion, I may add that I shall keep the Government of India duly informed of any further action which His Highness's Government may take in connection with this interesting subject.

Translation of a letter from His Highness the Nizam's Minister, to the Resident at Hyderabad,—No. 1510, dated 8th May 1871.

I HAVE received your letter dated 28th April 1871, No. 1000, giving cover to copy of a communication from the Officiating Collector, Kistna District, and a Teloogoo petition from Toomlooree Soobiah, inhabitant of Juggiapet, with a small packet containing a sample of mineral coal discovered in the District of Khammumet, His Highness's territory, forwarded for my information and favourable consideration, with your remark that it would be for me to determine whether I would be prepared to offer to the informant so large a sum as Rs. 2,000, or Rs. 1,000 more than was offered by the British Government for similar information in regard to the discovery, within British territory, of good workable coal without taking the precaution of insisting upon the reward being deposited with a third, party, and only paid in the event of the area occupied by the coal being sufficiently extensive and near the surface to ensure its being worked to advantage. In reply, I beg to forward for your perusal a report from Mahomed Haneef, Talookdar of Khammumet, in answer to an Ahkam addressed to him on this very subject. It will be seen from the report referred to, that the Tehseeldar of that District, having obtained information of a coal mine, has already set out in search of it; moreover, I have issued orders through Mr. White, who is now engaged in the examination of coal in the direction of Cheenoor, for the immediate despatch of a person capable of prosecuting such enquiries to the Tehseeldar of Khammum, with a view to his first examining the coal mine which the Tehseeldar may succeed in discovering. If the locality prove to be the same that Kodavendi Venkyah gave notice of, he would not be entitled to any reward, since in point of time he would be forestalled by the Tehseeldar in actually pointing it out, and the latter would thus become entitled to promotion by way of reward. But should the locality discovered by Kodavendi Venkyah be a distinct one from

that which the Tehseeldar may succeed in discovering and pointing out, then after due examination if the mine prove to be of genuine coal and sufficiently extensive, a reward of Rs. 2,000 Halee will, of course, be granted to the informant above alluded to. It will not, however, in my opinion, be necessary to deposit the amount of reward with a third party, inasmuch as my agreement to the amount of reward solicited, and the assurance thereof given to the informant by the Collector of Kistna District on the authority of your communication to that officer, would form an arrangement not less reliable, perhaps, than the actual deposit of cash with a third party, since by the former procedure both Governments would stand pledged for but a trifling sum of money. Be so good as to request the Collector of Kistna District to require his informant to depute one or two persons on his part to the Talookdar of Khammum in order to point out the coal mine, if necessary.

Translated substance of a Report from MAHOMED HANEEF, Talookdar of Khammum, to His Highness the Nizam's Minister,—dated 28th April 1871.

WITH reference to the Minister's Ahkam calling for information regarding the discovery of a coal mine either in His Highness's or British territory, to be ascertained from one Venkyah, inhabitant of Dantalpully, in Talook Khammum, who knows its locality, states that copies of the Akham, with translation of Colonel Applegath's letter on the subject, have been forwarded to the several Tehseeldars of the District, calling on them to furnish the required information with all practicable despatch; that previously to this a report (copy enclosed) was received from the Tehseeldar of Kandeecondah, dated 14th April 1871, giving notice of a coal mine, and of a block of coal obtained from it, and stating his intention to visit the spot in person to satisfy himself thoroughly and report positively on the subject; that the Tehseeldar was informed, in reply (copy enclosed), that his promised report is awaited with great interest, and should be submitted as early as practicable, and that his laudable exertions will be duly brought to the notice of Government. As regards the informant Venkyah, inhabitant of Dantalpully, it appears from the Tehseeldar's report, since received, that he has never been in Talook Kandeecondah, but that two persons of British territory had been there in search of coal in His Highness's dominions, and that the Tehseeldar of Juggiapet had addressed the Tehseeldar of Kandeecondah asking him to assist them. Upon this the latter officer having asked instructions whether the persons should be permitted to prosecute their purpose or not was told, under orders of the Sudder Talookdar, that they might be permitted to prosecute the search and take samples with them after weighment, being at the same time warned to bring Government orders for the future. Adds that nothing has been since heard as to who the two persons referred to were, where they proceeded, or whether or not they discovered any coal mines, and that should the Tehseeldar of Kandeecondah succeed in his explorations for coal, no time will be lost in reporting the particulars to Government.

From MAHOMED IBRAHEEM ALI KHAN, Tehseeldar of Kandeecondah, to the First Talookdar, Khammum District,—dated 14th April 1871.

I SOME time ago reported the arrival of some persons in search of coal from British territory, with a letter from the Deputy Sub-Magistrate of Juggiapet. Since that period I have heard that a person named Venkyah, inhabitant of Dantalpully, having obtained trace of a coal mine gave notice thereof to British Officers, applying for a large amount of reward; that a reward of one thousand rupees being offered, he declined to receive it, and has not since come forward. Upon this, deeming it inexpedient to remain inactive in the matter, I caused search to be instituted far and near for the coal mine referred to, and was so far successful as to obtain information of a coal mine in this talook* with a lump of coal therefrom. I have therefore started on a personal visit to the spot, after inspection of which, and having some portion of the ground dug up, I shall communicate the result in detail. In the event of my sanguine expectation of coming upon a coal mine being realized, I rely on your goodness for my exertions and the claims of informants for suitable rewards being duly brought to the favourable notice of higher authority. I am taking with me for comparison the sample coal brought to me. The circumstances above set forth may be reported to Government, should it be deemed expedient to do so.

* Kandeecondah.

Official memorandum from the Talookdar of Khammum District, to the Tehseeldar of Kandeecondah,—dated 27th April 1871.

IN reply to the forgoing, observes that the discovery of the coal mine is highly satisfactory, and it is hoped that several specimens of coal will be shortly forwarded for transmission to Government. The Tehseeldar is assured that after receipt of detailed information with samples of coal from him, his zealous exertions will be duly brought to notice. In the mean-

time his present report has been forwarded to put Government in possession of the limited information available. Adds that his further report is awaited with great interest, and should be furnished at as early a date as practicable.

Translation from His Highness the Nizam's Minister, to the Resident at Hyderabad,—No. 1727, dated 25th May 1871.

WITH reference to my letter dated 9th May 1871, No. 1076, regarding the Tehseeldar of Kandeecondah being deserving of promotion for his having traced out the existence of a coal mine, and the promise of a reward of Rs. 2,000 to Kodavendi Venkyah, if the coal mine which he offered to point out should be a separate and distinct one from that discovered by the Tehseeldar above referred to, I have the pleasure to forward, for your information, a report, with enclosure, received from the Talookdar of Yelgundel District, relative to the coal mine last mentioned, with copy of an Ahkam issued by me on the subject.

From MAHOMED HANEEF, Talookdar of Yelgundel, to His Highness the Nizam's Minister,—No. 21, dated 17th May 1871.

IN my previous report No. 12 of the 27th April 1871, I brought to notice the discovery of a coal mine by Mahomed Ibraheem Ali Khan, Tehseeldar of Talooka Kandeecondah, informing the Tehseeldar at the same time that his further report, after a full inspection of the mine, accompanied with specimens of coal, would be awaited. The Tehseeldar, in reply, has now forwarded a memorandum (No. 60, dated 10th May 1871), together with three specimens of coal, each weighing 5¾ seers, which, secured in a sealed box with the memorandum in original, I herewith submit. In doing so, I would beg to remark that the Tehseeldar has shown great zeal and energy, and taken much trouble in the exploration and discovery of the mine, even supposing any other person to have made the same discovery before the Tehseeldar, yet from the fact of such person having failed to point out the locality to any of His Highness's authorities, the Tehseeldar cannot, I submit, be considered as having no claim to the Government reward. I would further solicit consideration to his suggestion, which appears to be a judicious one, as to the employment of a certain number of men at two rupees each per mensem for the care of the mine, pending permanent arrangements and further orders from Government, and a sum of about Rs. 200, if sanctioned, would enable the jungle to be cleared and a passage prepared towards the locality, so that the person deputed by Government to examine the coal field might find his way to it without difficulty.

Memorandum from the Tehseeldar of Kandeecondah, to the First Talookdar of Khammumet, No. 60.

WITH reference to the memorandum No. 76, dated 26th April 1871, on the subject of coal, and requiring me to submit a full report accompanied with additional specimens, to be laid before Government, and touching on other points connected with the same subject, I beg, in pursuance of the above instructions, to submit the following detailed account of what I have seen and discovered on a personal visit to the spot where the coal mine is situated, together with several specimens of coal selected from it, and hope that it will be found to contain full information on the subject.

2. It so happened that in order to visit the spot it was necessary for me to travel considerable distances (from 60 to 120 miles in all) beyond the limits of the talooka under my charge by difficult and dangerous routes, though it has now been ascertained from enquiries that up to Dewurlagoodem, in the direction of Goondral, under the Palooncha jurisdiction, there is a very clear road over the village of Kamaram, Talooka Pukhal, suitable for travellers as well as carts; but my men, who were employed on coal researches, ignorant of the road in question, led me by the same forest routes by which they had themselves come at first, and I was in consequence much distressed for food and water, and found my journey extremely difficult in other respects. At length, having travelled a distance of nearly 16 miles from the border of Dewurlagoodem towards the locality of the mine, past Kamaram and strictly over hills and through frightful forests, at 10 o'clock in the morning I arrived at the spot, and found that the mine lay towards the north-west point in the bed of the jungle stream called Goondralwag, which, flowing from the border of Dewurlagoodem towards Goondral, under the Palooncha jurisdiction, joins in Goodavery River.

3. The bed of the stream is not clear and open, being everywhere encumbered with large and irregular boulders. As rain had fallen two or three days previously, pools of water were observable in several places and foot-marks of elephants all round the place. The Koyawars, a wild tribe, informed me that the locality is daily frequented by wild elephants for the sake of

forage and water, and that it was not safe to stay there, for there was no certainty when and from what direction these wild animals might be approaching; but trusting in God, and relying on the support and auspices of Government, I continued my progress in search of coal, making my way through the irregular passage up and down the rocks before mentioned.

4. When I had proceeded a mile in the bed of the river I began to perceive traces of coal on its west bank, which I traced on to about quarter of a mile, when the vein terminated. I caused digging operation on a small scale to be carried out over and within the banks. Owing to the great heap of earth on the surface of the bank, and want of proper and efficient tools, it was found impossible to dig the bank down to its bottom; but the operation was successfully carried out within the bed of the stream to the depth of a yard, which brought to light, underneath the sandy surface, a stratum of coal occupying a space of 10 yards, where the bed was free from rocks; in some places coal is perceptible even above the sandy surface. A doubt suggested itself to my mind whether the stratum above referred to might not also extend below the large rock; but this point, I regret, could not be cleared up without a few days' stay on the spot, keeping away the elephants, making available a good supply of digging implements, and employment of professional men.

5. I should not omit to mention the large masses or heaps of coal that were seen lying in the bed of the river above the sand, and in the inner side of its bank they do not much differ in their relative dimensions, but are somewhat of an equal size. The depth of these and of the stratum before mentioned should have been ascertained, but from want of opportunity by the constant fear of wild elephants, from small instruments alone being available, and the impossibility of procuring large instruments, I found the task beyond my power.

6. The coal discovered, from its varied appearance, colour, and quality, would seem to admit of distribution into several sorts, *viz.*, 1st sort, dark, 2nd, less dark, and 3rd, least dark. In some places, by the action of water, the coal has lost its outward colour, and when pressed by the hand crumbles into bits; in other places, the coal lying on the surface is so much engrained with the earth that it is reduced to the same colour with it. I have transmitted by Shaik Boorhan, peon of my Cutcherry, a small quantity of each sort of coal above described, an inspection of which will explain everything.

7. By the time all the above enquiries and examination were completed, it was about midday, and as those who had accompanied me were unable to bear hunger and the exertion of returning at once, and were much fatigued by the long and harassing journey, and as it was, moreover, desirable to verify the presence of wild elephants about the place, the whole party halted in the bed of the river. In the afternoon of the same day, four elephants, one of them a large one with a pair of thick tusks, and the others comparatively small, made their appearance and began to advance towards us. When they approached within 10 or 12 yards of us, one of my peons, who happened to see them first, came running to give me notice. Looking up, I perceived that it would be highly unsafe for us to remain where we were, and finding my party exceedingly alarmed and perplexed, the whole of us took refuge behind the trees on the bank of the river, and notwithstanding all the noise and uproar we made, we totally failed to check or intimidate them, as they with perfect indifference and ease engaged themselves in splashing water, scattering leaves of trees, and feeding on them, which done, they stood still, with their faces turned towards us. We judged it expedient to take up our necessary baggage the best way we could and start immediately, and accordingly again making 16 miles through the same jungle infested with the elephants with great difficulty escaped with our lives in safety, for till we reached inhabited and cultivated parts there was ground for apprehension. The people of these parts state that the big elephant is a furious and wicked one; that it has no fear, and is in the habit of attacking men whenever it sees them; that it has even entered some villages and attempted to kill people, who from fear have deserted their villages. That such a bold and vicious animal should to-day have refrained from attacking us I attribute entirely to the grace of God and the influence of the good fortune of Government which subdues its enemies. We therefore continue thankful to God, the Creator of Heaven and Earth, for the protection and salvation of His servants, and grateful to Government for giving us refuge by its power and perpetual good fortune.

8. My object in entering into such details in the forgoing paragraph in regard to the elephants is to warn any person who may come in this direction hereafter to be on his guard about them, and show the necessity of providing himself with weapons suitable for killing elephants, and, if possible, with the aid of the Government, hunting elephants besides; otherwise, he will risk his own life.

9 I now propose to say a few words in regard to the season suitable for visiting this locality. Information on this point would be useful not only for the security of life and property, but also for ensuring the coal mine being visited and examined with advantage in the most favourable season for such purposes. In the rainy season, apart from the impossibility

of finding a way owing to the density of the woods, the height of the grass, numbers of wild animals, and flood in the river, which presents itself in seven or eight places on the way to the locality, it will not only be impraticable to gain access to the site of the mine, but the mine itself would be submerged by water. As regards the cold weather, although as compared with the rainy season there would not be much flood and vegetation, some obstacles would still exist, and owing to the grass on the ground not having dried up and been burnt, it would be difficult to find a way, and the injurious nature of the water and atmosphere at the period of the year would affect the heath of strangers. For the above reasons, then, it would not be advisable in either the cold or rainy season to visit these parts. After their close, in the beginning of the month of February would be the most advantageous period in every respect for the purpose.

10. Although at the present time an opportunity is available of obtaining a cursory view of the coal mine, yet there is very little time left, as this is the 10th of May 1871, and it only wants 26 days for the rainy season to set in. It does not appear likely that an officer from either His Highness's or the British Government can arrive here in such a short interval, nor is there any dependence on the rains, for even in the interval before the rainy season untimely rain-fall might occur in some places here and flood the rivers and channels, as was witnessed a few days ago, when some showers of rain fell in certain places and filled the tanks, ponds, and channels with as much water as to be sufficient for ordinary purposes.

11. Hereafter when it may be proposed to depute an officer to visit the mine, I would suggest the jungle being first cleared, to the width of 10 yards on either side of the road, from above Kamaram to the site of the mine. Although for the present I have caused flags with the words "Ilaqua Sirkari Alee" (Government property) to be put up on two large and lofty trees near the coal mine to indicate its situation, and, as far as possible, smaller marks to be fixed on the trees along the road, so as to lead one straight to the spot, yet these marks cannot be expected to endure long, and I had not the necessary instruments for making more lasting ones.

12. As it appeared to me expedient that some arrangement should be made for the protection of the mine, I have stationed, as a temporary measure, two men of the Koyawar class from those of Dewurlagoodem and other villages of Goondral, and from Mouzah Kamaram respectively, associated with a Police Jowan from the Goondral Thannah, instructing them to keep watch over the mine with the utmost diligence and care, so that no one is allowed to encroach upon it. But the Koyawars have asked for pay, and I would recommend their being salaried at Rupees two each per mensem, and retained for such period as may be deemed necessary. In this matter Government will decide as it may judge fit.

13. I now beg to submit that from first to last I have not omitted the smallest point essential to success in my exertions in the explorations for coal which have fortunately resulted in the discovery of the coal mine under present notice, having kept the object constantly in view during my tours of the talooka, and also employed several persons at my own private expense in this business. Even at the present time, amidst a multiplicity of work connected with the attachment of the Palooncha Estate, and the necessary arrangements consequent on it, and with the annual jummabundy of the talooka under my charge at hand, being conscious that in the rainy season the coal mine will be submerged by water, and the chance of its discovery and examination be thus cut off, I immediately proceeded to the spot through frightful woods and forests, and travelling even by night. Under these circumstances, I indulge the firm hope that by the appreciation of my humble services by Government I shall be liberally rewarded by promotion to higher grades, and by the special favour of the head of the administration be made to enjoy the good fruit of my exertions in this matter.

14. Moreover, to the persons employed by me in the enquiries for coal—*viz.*, 1, Veeriah, goldsmith; 2, Budda Veeriah, shop-keeper; and 3, Luchmoodoo Tilingah, residents of Mouzah Dantalpully in this talooka—I had given hopes of their receiving rewards from Government, besides the expenses of their subsistence, &c., defrayed by myself. I therefore beg that Government will take this matter into favorable consideration, and *satisfy* their reasonable hopes by way of encouragement; for I hear liberal rewards of money, &c., are proclaimed under the British Government for giving similar information.

15. I hope that the Talookdar will, in fulfilment of the promise contained in his memorandum No. 76, bring my labour and exertions to the favorable notice of Government in such terms as he may consider just and fitting, supported with his own kind recommendation, in order that the servants of Government, having received the rewards attached to their good services, may feel grateful and offer thanks. In conclusion, I beg pardon for my presumption.

Ahkam addressed to MAHOMED HANEEF, Talookdar of Yelgundel, under date the 23rd May 1871.

YOUR report dated 17th May 1871, No. 21, submitting a memorandum from Mahomed Ibraheem Ali Khan, Tehseeldar of Talooka Kandeecondah, on the discovery by him of a coal mine, accompanied with a box containing specimens of coal from it, and offering remarks thereon, has reached the Sirkar and afforded high satisfaction, not only by the hope it has inspired of obtaining trace of a source of coal supply, but also as affording the first instance of exertions in this direction, attended as they have been with complete success, on the part of the servants of this Government, under circumstances of great difficulty and labor. The suggestion of the Tehseeldar regarding the felling of trees and clearing a passage is a highly judicious one, and sanction is given to an expenditure even up to Rupees 500, if necessary, for the purpose. Information is required as to the number of men of the Koyawar class necessary to be entertained at Rs. 2 each per mensem for the care of the coal mine; when this is furnished, the necessary sanction will be given. As doubtless the Tehseeldar has shown great zeal and energy, and been at considerable labor and exertion in the exploration and discovery of the coal mine under notice, so soon as it shall have been duly examined a reward of Rs. 2,000 and promotion to the next higher grade of his class will be bestowed upon him. Peremptory orders have again been issued through the Secretary, in the Public Works Department, to Mr. White, Assistant Engineer, now engaged on coal explorations, to despatch some one at once before the commencement of the rains, with a view to the requisite examination being carried out. It would be as well to proclaim at the place that a reward of 200 Hallee Sicca Rupees will be given to any one killing a large elephant, and of Rs. 100 for every other elephant.

From the Resident, to the Minister,—No. 1254, dated 26th May 1871.

WITH reference to your letter No. 1727, dated 25th instant, communicating the discovery of a coal mine by the Tehseeldar of Kandeecondah, and copy of the orders issued by you on the subject, I have the honor to state that I have been highly gratified by the perusal of the whole of the papers in the matter; but it appears to me that if, instead of issuing orders for the destruction of elephants, you had taken measures for capturing them by such contrivances* as are adopted in the Central Provinces, Mysore and Ceylon, it would certainly prove advantageous to your Government, and the elephants caught would be useful for State purposes.

* Obee and Akral.

From the Minister, to the Resident,—No. 1828, dated 2nd June 1871.

IN reply to your letter No. 1254, dated 26th ultimo, I beg to state that your suggestion on the subject of catching elephants is highly judicious and proper, and I thank you for it, as it is calculated not only to rid the people of the place of a source of annoyance and trouble, but would also tend to ensure the security of their lives, while the animals themselves would be useful to Government for purposes of riding and carrying baggage and burden. I regret, however, that their capture by the elephant drivers here is out of the question; but I understand that professional elephant catchers are shortly expected at Hyderabad with elephants for sale. If they agree to capture elephants here, their services will be certainly availed of for scatching the elephants in question.

From H. LEPOER WYNNE, ESQ., Under Secretary to the Government of India, Foreign Department, to the Resident at Hyderabad,—No. 1748 P, dated Simla, the 18th August 1871.

I AM directed to acknowledge the receipt of your letter, No. 8, dated the 3rd July 1871, and of its enclosures, intimating that a valuable seam of coal has been discovered in the territories of His Highness the Nizam.

2. The Viceroy and Governor General in Council has learned of this discovery with much satisfaction, and desires that Sir Salar Jung, as well as yourself, should be informed that the Government of India fully appreciates the value of the action taken in order to place the question of the existence of coal in this part of the country beyond doubt.

3. This correspondence will be published in the *Gazette of India*.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

IRRIGATION OPERATIONS OF FUSL KHURREEF IN THE NORTH-WESTERN PROVINCES UP TO 30th JUNE 1871.

	CANAL DIVISIONS.	Water distributed during the month: Depth in Canal at Regulating Gauge. Full supply, feet.	Actual throughout, feet.	Gross Consumption, cubic feet per second. Estimated full supply.	Actual average throughout.
Ganges Canal	Northern ..	10·00	8·48	710	477
	Meerut ..	8·10	6·82	1,037	205
	Futtehgurh ..	6·80	3·65	667	734
	Boolundshuhur ..	6·35	6·00	933	763
	Allygurh ..	5·60	5·40	1,053	327
	Etawah ..	4·80	2·70	771	326
	Cawnpoor ..	6·20	5·00	958	772
	Total ..	..	..	6,129	3,604
	Eastern Jumna Canal	..	4·30	..	961
	Doon Canals ..	..	..	..	69
	Bundelkhund Irrigation Works ..	..	..	..	..
	Rohilkhund Canals ..	..	..	..	137
	Grand Total ..	..	..	6,129	4,771

Navigation Return, Ganges Canal. Principal Items of Traffic. Nature of Traffic.	Up. Mds.	Up. No.	Down. Mds.	Down. No.	Total Up and Down. Mds.	Total Up and Down. No.
Grains—						
Wheat ..	..	..	825	..	825	..
Gram ..	4,198	..	..	..	4,198	..
Oorud ..	50	..	2,148	..	2,198	..
Urhur ..	46	..	4	..	50	..
Paddy ..	..	..	125	..	125	..
Barley ..	..	..	405	..	405	..
Total ..	4,294	..	3,507	..	7,801	..
Cotton ..	..	..	3,860	..	3,860	..
Oil-seeds ..	..	..	3,197	..	3,197	..
Salt ..	975	..	4,935	..	5,910	..
Metals ..	1,770	..	..	..	1,770	..
Building materials ..	3,402	..	18,010	..	21,412	..
Miscellaneous goods ..	1,997	..	5,943	..	7,940	..
Firewood ..	..	..	29,408	..	29,408	..
Bamboos ..	..	1,551	..	553,540	..	555,091
Tors or unsquared timber ..	..	..	..	6,280	..	6,280
Kurrees, or squared timber ..	..	19	..	7,429	..	7,448
Logs ..	..	..	..	5	..	5
Miscellaneous timber ..	..	5	..	174	..	179
Live-stock ..	..	..	..	46	..	46
Total ..	12,438	1,575	68,860	567,474	81,298	569,049
Fusl Khurreef 1869-70, to 30th June 1870 ..	..	..	..	..	91,144	790,051
Decrease 1871					9,846	221,002

Land irrigated (approximate). Zillah.	Acres.	Rain-fall. Total from the 1st April 1871 to 30th June 1871.	Rain-fall. Average of ten previous years for the same period.
Saharunpoor ..	17,571	16·7	5·20
Mozuffernuggur ..	31,309	5·8	4·78
Meerut ..	55,389	9·0	7·16
Boolundshuhur ..	27,989	5·1	2·80
Allygurh ..	40,404	5·3	3·49
Muttra ..	5,321	13·1	2·85
Agra ..	454	11·2	2·73
Etah ..	10,497	5·9	2·94
Mynpoorie ..	9,508	11·0	3·62
Futtehgurh ..	6,217	11·3	4·11
Etawah ..	13,392	10·6	3·13
Cawnpoor ..	18,521	7·7	3·41
Dehra Doon ..	3,325	25·9	9·18
Bijnour ..	381	11·7	6·08
Terai ..	733	20·7	6·45
Bareilly ..	6,674	16·3	7·04
Jhansie ..	81	7·5	4·89
Humeerpoor ..	287	8·4	3·10
Total ..	248,053	..	..
Fusl Khurreef. 1869-70, to 30th June 1870 ..	248,745	..	..
Decrease, 1871 ..	692	..	..

REMARKS.

The mean volume passing Roorkee gauge during the month was 4,853 cubic feet per second.

Volumes discharged—

Etawah Branch	Tail ..	22	c. ft. per second.
,, ,,	Escapes ..	583	,, ,,
Cawnpoor ,,	Tail ..	244	,, ,,
,, ,,	Escapes ..	400	,, ,,
Total	..	1,249	,, ,,

During the early part of the month the demand for water in the terminal Division was merely nominal, and towards the end ceased entirely. Steady rain prevailed up to the 27th, and heavy rain during the subsequent portion of the month. The average condition of crops throughout the month was good.

There was a moderate demand in the Upper Divisions during the former portion of the month, but it decreased considerably during the latter. The requirements have been chiefly for sugar-cane, indigo, and cotton, but also moderately for rice "puleo" and 4th-class crops.

The rain-fall during the month was considerable.

EASTERN JUMNA CANAL.

For the first eight days of the month there was only a partial demand for water, it however increased considerably until the 20th, but subsequently ceased, except for rice "pulleo." The canal was closed for the day on the 22nd on account of floods.

Whether alternately rainy and clear during the former part of the month, and heavy rain during the latter.

DOON CANALS.

Fair demand for rice during the first ten days of the month, which increased until the 20th, but subsequently subsided.

Steady and occasionally heavy rain throughout the month.

ROHILKHUND CANALS.

Very slight demand.

BUNDELKHUND CANALS.

Demand nominal.

Traffic Returns.—Slight increase in transport of grain. Jowlie Lock was opened for traffic on the 9th and Nirganjnee Lock was closed for repairs from the 3rd to end of the month. Owing to these interruptions the rafting trade has ceased, and merchants have been obliged to remove rafts from the water and stack timbers on canal bank.

The Terminal Divisions have alternate weeks of high and low supply.

ALLAHABAD:
The 4th August 1871.

P. S. MARINDIN, *Capt., R. E.,*
Offg. Asst. Secy. to Govt., N. W. P., Irrigation Branch.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Statement of Rain-fall and Agricultural Prospects in the North-Western Provinces, Rajpootana, Bengal, and Central India.

[NOTE.—The information in this statement was received too late for insertion in the general abstract published in last week's supplement.]

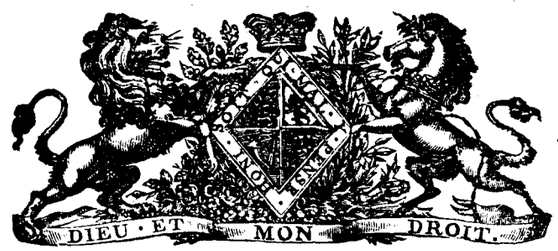
No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Rain-fall for week. Week ending	Rain-fall for week. Inches.	Date of despatch from Local Government or Administration.	State of Agricultural Prospects.	Remarks by Local Government or Administration.
				Inches.					
1	N. W. Provinces ...	Benares ...	.....	3·7	.....	.....	August 18	Crops suffered a good deal from heavy rain; Cotton and Indigo nearly destroyed.	
		Allahabad ...	.....	5·5	.....	.....	,,		
		Agra ...	.....	10·	.....	.....	,, ...	Hardly any injury done. Prospects good.	
		Meerut ...	.....	7·8	.....	.....	,, ...		
		Bareilly ...	.....	3·5	.....	.....	,, ...	Good, only land have suffered.	
		Serohi, at Erinpoora ...	.....	.....	July 29 ...	2·66	,, 8 ...	Very good	The rain has almost all come up with a westerly wind; continues cloudy; break in rain wanted.
2	Rajpootana ...	Marwar, at Joudpore ...	.....	...	,, ...	2·87	,, ...	Crops promising well; ploughing and sowing proceeding vigorously.	Weather rainy. The rain-fall is only for Joudpore for week ending 24th July 1871, but elsewhere there has been more rain, especially in the north and east of Marwar.

No.	Presidency or Province	District.	Date of District Report.	Rain-fall for fortnight preceding.	Rain-fall for week. Week ending	Rain-fall for week. Inches.	Date of despatch from Local Government or Administration.	State of Agricultural Prospects.	Remarks by Local Government or Administration.
	Rajpootana, concld.	Meywar, at Oodeypore ...	.....	...	July 29 ...	0·78	August 8 ...	The crops all in vigorous growth and have not yet suffered from the want of rain.	Wind generally south-west. Rain seems imminent, but does not fall.
		Eastern States, Bhurtpore..	.....	...	„ ...	0·8	„ ...	As bright as could be wished, and the zemindars are sanguine of plentiful Khurreef harvest.	Weather cloudy and humid. The total fall since 22nd June, when register was commenced, is 11 inches.
		Jeypore, at Jeypore ...	.....	...	„ ...	2·65	„ ...	Good	Weather very cloudy, wind almost westerly.
		Harrowtee and Tonk, at Deolee	.....	...	„ ...	2·3	„ ...	In Kotah, Jalowar, and Shapoora young crops beginning to suffer from excess of rain. In Bhoondee, Tonk, and Mpenah Districts, good.	During the week the rain has been more or less heavy everywhere, and continued all over country. Wind south and south-west. The rain fall is as recorded at Deolee, Kotah, an Tonk.
		Kotah	.....	...	„ ...	4·5			
		Tonk	.....	...	„ ...	8·7			
		Ajmere and Mairwara Districts, at Ajmere ...	.....	...	„ ...	4·45	„ ...	Good	Wind almost westerly, weather very cloudy.
		Beawur	.....	...	„ ...	5·7	„ ...		
		Harrowtee and Tonk, at Deolee.	.....	.....	August 5 ...	5·9	August 15 ...	Good	Quite seasonable.
		Tonk	.....	.....	„ ...	0·2	„ ...	„	A seasonable break has occurred here and at Shahpoora.
		Kotah	.. ...	.....	„ ...	4·8	...	„ ...	Rain throughout the week. A break required here, as at Boondee, excess of rain proving prejudicial to crops.
		Jhallawar	.....	.....	„ ...	4·1	„ ...	„ ...	
		Jeypore, at Jeypore ...	.....	.....	„ ...	2·31	„ ...	„	Weather cloudy, wind westerly.
		Serohi, Erinpoora ...	.....	.....	„ ...	1·5	„ ...	Excellent	Quite seasonable.
		Eastern States, Bhurtpore	.....	.....	.....	.....	„ ...	Good	Weather dry but cloudy, Nights damp. No apprehension exists owing to break.
		Meywar, at Oodeypore ...	.....	.....	„ ...	2·81	„ ...	Very good	The weather has been cold, cloudy and rainy.
		Ulwur	.....	.....	„ ...	.....	„ ...	Excellent	No further particular given in the statement.
		Marwar, at Joudpore ...	.....	.....	„ ...	0·08	„ ...	Very good	Rain-fall only for Joudpore where less rain has fallen than elsewhere.
3	Bengal ...	Bhaugulpore ...	August 11 ...	...	August 12...	1·5	„ ...	Jawrah and Bhadoi crops much damaged; Amun very good.	
		Monghyr ...	„ 12 ...	...	„ ...	2·5	„ ...	Bhadoi crops much injured; Amun cheerful.	
		Purneah ...	„ 7 ...	...	„ ...	2·2	„ ...	*	* No information received.
		Rajmehal ...	„ 12 ...	...	„ ...	*	„ ...	Same as last week	* Few drops of rain on the 7th and 11th.
		Deoghur ...	„ ...	...	„ ...	3·1	„ ...	Good; low land paddy to suffer from continued rain.	
		Pakour ...	„ ...	...	„ ...	·1	„ ...	Paddy thriving.	
		Jamtarah ...	„ 11 ...	...	„ ...	3·	„ ...	Thriving; twelve-anna crop expected.	
		Patna ...	„ 12 ...	...	„ ...	1·1	„ ...	Bhadoi much injured by the inundations of the Soane and the Ganges; Rice promising.	
		Gya ...	„ ...	.....	„ ...	6·2	„ ..	Bhadoi destroyed.	
		Chumparun ...	„ 5 ...	.....	„ ...	·1	„ ...	Bhadoi excellent; Aughani or Amun being sown.	
		Sarun ...	„ ...	.....	„ ...	·3	„ ...	Rain crops much injured by heavy rains; Rice good.	
		Shahabad ...	„ 12 ...	.....	„ ...	9·4	„ ...	Bhadoi a little damaged; Amun favorable.	
		Tirhoot ...	.....	.....	.....	...	.....	Good; no further damage to Ous.	
		Rajshahye ...	„ 10 ...	.....	„ ...	3·1	„ ...	Crops suffering from want of rain.	

No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Rain-fall for week.		Date of despatch from Local Government or Administration.	State of Agricultural Prospects.	Remarks by Local Government or Administration.
					Week ending	Inches.			
	Bengal, concluded	Bograh	August 11	.....	August 12	·9	August 15	Cultivation favorably progressing; more rain needed.	
		Dinagepore	„ 5	.....	„	·1	„	Ditto ditto	
		Maldah	„ 4	.....	„	2·	„	Fair.	
		Moorshedabad	„ 12	.....	„	1·6	„	Crops on more than 10,000 beegahs of land have been destroyed by inundation; Amun being sown.	
		Pubna	„	.....	„	1·9	„	Ous slightly injured; Amun good.	
		Rungpore	„ 5	.....	„	·4	„	Amun promising; Ous reaped.	
		Burdwan	„ 12	.....	„	·1	„	Ous partly injured by the over-flow of the Bhageeruthee; Amun good.	
		Bancoorah	„	.....	„	2·9	„	Crops progressing well.	
		Beerbhoom	„	.....	„	1·5	„	Good.	
		Hooghly	„	.....	„	4·6	„	Favorable.	
		Howrah	„	.....	„	5·2	„	Flourishing.	
		Midnapore	„ 11	.....	„	3·9	„	Good.	
		Nuddea	„ 12	.....	„	1·1	„	Favorable; low land inundated ...	Fever at Kancharparra and Debogram.
		Jessore	„ 11	.....	„	2·3	„	Ous being reaped; Amun good.	
		Dacca	„ 4	.....	„	4·	„	Good.	
		Backergunge	„ 5	.....	„	4·	„	Favorable generally.	
		Furreedpore	„ 12	.....	„	·2	„	Good.	
		Sylhet	„ 7	.....	„	1·	„	Good; no cause of apprehension.	
		Cachar	„ 5	.....	„	2·4	„	Ous mostly planted out; the early one has almost failed, but it is not of much consequence.	
		Chittagong	„	.....	„	2·5	„	Generally favorable.	
		Noacolly or Bullooah	„ 4	.....	„	8·1	„	Ous partly damaged; Amun good.	
		Tipperah	„ 5	.....	„	2·7	„	Good.	
		Cuttack	„	.....	„	2·9	„	Early crop being reaped; a good outturn expected; Amun good.	
		Balasore	„	.....	„	3·8	„	Flourishing.	
		Pooree	„ 4	.....	„	·6	„	Generally good; slight injury from inundation.	
		Hazareebaugh	„ 12	.....	„	·9	„	Continuous heavy rains unfavorable for the early crops, but good for others.	
		Lohardugga	„ 5	.....	„	5·1	„	A little too much rain for the Bhadoi crops; Rice excellent.	
		Maunbhoom	„ 12	.....	„	4·7	„	Generally favorable.	
		Singbhoom	„	.....	„	2·5	„	Favorable.	
		Durrung	„ 5	...	„	4·8	„	Fair.	
		Nowgong	„	...	„	·9	„	Ous promising; Amun not very favorable for want of rain.	Earthquake at 9½ P. M. on 30th July 1871.
		Seebsaugor	„	...	„	1·7	„	Fair; Amun plants being transplanted.	Ditto ditto followed by a heavy thunderstorm with vivid lightning.
		Kamroop	„	...	„	·9	„	Want of rain retards the transplantation of Amun crop.	
		Luckimpore	„	...	„	3·4	„	No apprehension as regards Rice crop.	
		Julpigoree	„ 4	...	„	·3	„	Promising, but wants more rain.	
		Goalparah	„ 7	...	„	·8	„	Amun suffering from want of rain.	
		Garrow Hills	„ 5	...	„	1·2	„	Good.	
		Darjeeling	„	...	„	2·1	„	Same as last week.	
		Cooch Behar	„	...	„	*	„	Fair, if it rains soon.	* No rain-gauge.
		Indore	.....	...	„ 5	5·93	„	Good.	
		Bhopal	.....	...	„	11·15	„	Satisfactory	Rain-fall from 24th to 29th ultimo, inclusive ... 2·22
		Gwalior	.....	...	„	...	„	Favorable	Rain-fall approximate to 1st instant ... 20·
		Bundelcund Agency—Nowgong.	.....	...	„	3·2	„	Fair	Previous rain-fall ... 23·06
		Bhagelcund Agency. — Myhere	.....	...	„	...	„	Favorable	Rain-fall up to date ... 38·
		Bhagelcund Agency. — Nagode	.....	...	„	...	„	Ditto	Ditto ditto ... 41·03
		Bhagelcund Agency. — Sohawal	.....	...	„	...	„	Ditto	Ditto ditto ... 38·09
		Western Malwa Agency. — Augur	.....	...	„	6·9	„	Good.	
		Western Malwa Agency. — Mehidpore	.....	...	„	10·17	„	Ditto.	
		Rutlam*	August 5	...	„	13·42	„	.....	* This heavy fall of rain will be injurious to the Mucka crops if the weather does not clear up; it is favorable to Rubbee crops.
		Oojein	„	...	„	17·35	„	Good.	
		Jonrat	„	...	„	6·47	„	„	
		Neemuch	„	...	„	2·89	„	Exceedingly favorable	Previous rain-fall 15·32.
4	Central India								

No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Rain-fall for week ending		Date of despatch from Local Government or Administration.	State of Agricultural Prospects.	Remarks by Local Government or Administration.
					Week ending	Inches.			
	C. India, *contd.* ...	Goona ...	August 5	...	August 5	8·45	August 15	Promising	Previous rain-fall 5474.
		Bheel Agency { Sirdarpore	"		"	6·28	"	Good.	
		Dhar	"		"	6·94	"	"	
		Jhaboon...	"		"	10·79	"	"	
		Rajpore ...	"		"	·54	"	"	
		Deputy Bheel Agency. { Maunpore	"		"	7·3	"	"	
		Begorle ...	"		"	4·1	"	"	
		Burwanee	"		"	2·1	"	"	
		Jamneea...	"		"	5·8	"	"	In some places Jawre had to be sown twice.
		Khull ...	"		"	2·9	"	"	

No. 33 of 1871.



SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, SEPTEMBER 2, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

Non-Subscribers to the GAZETTE *may receive the* SUPPLEMENT *separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.*

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA *is required by Law, of which it has been customary to publish in the* CALCUTTA GAZETTE, *will be included in the* SUPPLEMENT. *For such Orders and Notifications the body of the* GAZETTE *must be looked to.*

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

Results of an experiment in the cultivation of "Oosur" Land in the North-Western Provinces.

From COLONEL F. H. RUNDALL, R. E., Deputy Secretary to the Government of India, Public Works Department, to the Joint Secretary to the Government of the North-Western Provinces in the Public Works Department, Irrigation Branch,—No. 391 I, dated Simla, the 19th August 1871.

I AM directed to acknowledge the receipt of your letter No. 708 I—C of the 12th instant, and papers enclosed, describing the results of an experiment in the cultivation of "oosur" land, *i. e.*, land affected by the "reh" efflorescence, in the Allygurh Division, Ganges Canal.

2. In reply, I am to state that His Excellency the Governor General in Council is of opinion, that there is no subject more interesting or important than that of the reclamation of "reh" lands, and considers that all experiments in this direction should be greatly encouraged, and their results most accurately recorded.

3. The present experiment seems to lead to the conclusion that the process of efflorescence is generally a gradual one; that the saline particles come slowly to the surface, and, when caused by the exudation of canal water, can be counteracted by constant, but very deep, cultivation.

4. It certainly appears to be a more promising experiment than those by which "reh" can be supposed to be counteracted by deep thorough drainage, though His Excellency greatly fears that the process pursued and apparently with so much success might have to be every year or at short intervals renewed, to prevent the recurrence of "reh" in the soil.

5. It seems doubtful whether tile drainage and irrigation can be carried on together. All tile drainage shows a disposition to get stopped, but to what extent on most Indian soils water thrown on the surface by irrigation would have the effect of rapidly stopping drains, it is not possible at present to determine.

6. In India, however, where labour is so cheap, and in the irrigated districts chiefly, where the produce is so valuable, an experiment of this kind would be worth trying, and it appears very probable that open drains 100 to 150 feet apart, and about 3 feet deep, might be found sufficient to prevent efflorescence in the intervals, especially if irrigation were constantly in use. These drains will, doubtless, have to be scoured perhaps more than once in a year, but the process in soft alluvial soils would be extremely inexpensive and easy.

7. There may, however, be many descriptions of and causes for saline efflorescences, all of which would probably require different treatment. Although land on which "reh" effloresces is also called "oosur," the true *oosur* is understood to be land free from efflorescence, but is underlaid at a depth of from 6 inches to one foot by a stratum, more or less continuous, sometimes of considerable thickness of kunkur, sometimes in block (known as silia), and at other times in strings and nodules. "Reh" is of course merely a generic name for all saline efflorescences. Sometimes it is an impure sulphate or carbonate of soda, sometimes a *bonâ fide* chloride of sodium, and sometimes carbonate or nitrate of potash, but generally more or less a mixture of all. It rises to the surface by capillary attraction.

8. In conclusion, I am to communicate to the Government, North-Western Provinces, the thanks of His Excellency for the interesting information afforded in the present papers, and to say that the foregoing remarks should be regarded as suggestions made with the view of eliciting discussion, and that a further report will consequently be awaited of the experiments ordered to be undertaken on the larger scale.

Nos. 392—406 I.

Madras.
Bombay.
Bengal.
Punjab.
Oudh.
Central Provinces.
Sindh.
British Burmah.
Mysore and Coorg.
Rajpootana.
Hyderabad.
Central India.
Ajmere.

COPIES of this correspondence forwarded to the Agricultural Department and the Local Governments and Administrations marginally noted for information, and to the Home Department for publication in the *Gazette of India*.

From R. E. FOREST, ESQ., Officiating Joint Secretary to the Government, North-Western Provinces in the Public Works Department, Irrigation Branch, to the Secretary to the Government of India, Public Works Department,—No. 708 I.—C., dated Nynee Tal, the 12th July 1871.

I AM directed by His Honor the Lieutenant-Governor of the North-Western Provinces to refer to your No. 1471 of the 21st May 1869, and to forward, for the information of His Excellency the Governor General in Council, copies of the papers noted in the margin, containing a very interesting report by Captain Parsons, Executive Engineer, Allyghur Division, Ganges Canal, on the results of an experiment in the cultivation of "oosur" land, *i. e.*, land affected by the reh efflorescence.

No. 1996, dated 22nd June 1871, from the Officiating Superintending Engineer, 1st Circle, Irrigation Works.
No. 1044, dated 14th idem, from the Executive Engineer, Allyghur Division, Ganges Canal, to the address of the Officiating Superintending Engineer, 1st Circle, Irrigation Works.
Valuation Statement of Oosur Field, reclaimed in the years 1870-71 and 1872.
General Order No. 706 I—C of 12th July 1871, to Officiating Superintending Engineer, 1st Circle, Irrigation Works.

From CAPTAIN C. S. MONCRIEFF, R. E., Officiating Superintending Engineer, 1st Circle, Irrigation Works, North-Western Provinces, to the Joint Secretary to the Government, North-Western Provinces, Public Works Department, Irrigation Branch,—No. 1996, dated Meerut, the 22nd June 1871.

Cultivation of Oosur Land in the Allyghur Division, Ganges Canal.

IN reply to General Order No. 1169 I of 17th April, I have the honor to forward an interesting report by Captain Parsons on an experiment made in his Division by Sub-Conductor McArther on the reclamation of oosur land. This shews an actual cost of reclamation of Rs. 41 per acre, and a probability that two years' produce would cover this outlay. It remains of course to be seen whether the salts will rise again in the soil or not, and how often the process of trenching and manuring may be necessary. As I think, too, that both Captain Parsons and Mr. McArther are apt to be sanguine in their views, I am far from looking on this remedy for 'oosur' land as proved. It is, however, a very interesting and so far successful experiment, and I would respectfully suggest that a small sum, say Rs. 500, might be well expended on repeating it on a larger scale. If such a sum would be put at my disposal, I should like to give about Rs. 300 to the Executive Engineer, Allyghur Division, and the balance to the Executive Engineer, Boolundshuhur Division. Sub-Engineer Elahee Buksh attached to the latter division is very well qualified to carry out an experiment of this sort.

From CAPTAIN B. J. PARSONS, Executive Engineer, Allyghur Division, Ganges Canal, to the Superintending Engineer, 1st Circle, Irrigation Works, North-Western Provinces,—No. 1044, dated Allyghur, the 14th June 1871.

WITH reference to your No. 1316, dated 24th April, I have the honor to inform you that two experiments have been made to cultivate oosur land in this Division; one has proved successful, and the other failed. The former was carried out on Mr. McArther's method, and the latter according to the verbal instructions of Dr. Jameson.

2. In July 1870, Mr. McArther took up two pieces of land near the Poordilnuggur Bridge, Cawnpore Branch Canal, within our boundaries, aggregating 1¾ acres, on which not even grass would grow.

3. He first of all spread horse, cow, and sheep's dung over the surface to a depth of about three inches, and damped the soil with canal water. On one side across the full breadth a trench was dug one foot deep and one foot wide, and the soil used to make a boundary to the field.

Trench No. 2 was then dug a foot from the first, of the same width and depth, and the soil, well mixed up with the manure, was thrown into trench No. 1.

Trench No. 2 was filled up with soil, in a similar way taken from trench No. 3, and so on, till the whole length of field had been trenched.

4. All clods were carefully broken up, and all small kunkur and rubbish cleared off the ground.

5. Small water-course channels were then made, and the ground divided into plots (kyarees) in the usual way, and a top-dressing of manure and silt of about three inches was roughly mixed with the soil by *phowrah* (hoes).

6. It was then too late to sow rice, so plants nine inches high were purchased, and put in by hand six inches apart after the *kyarees* had been well flooded.

7. The crop was above the average of those in the neighbourhood.

8. After the rice was cut about the 30th November barley and pease were sow. The land was ploughed with a country plough, one way, and then crossed; and the seed was sown in the furrows made by the second ploughing. The crop received the usual warterings, and seemed to be a most promising one, for it was about 4 feet high on the 23rd February when a severe hail storm very nearly destroyed the whole of it. The crop was cut on the 27th March.

9. On the 8th of April, the land was sown with indigo, and in accordance with the system in vogue, the land was first irrigated, and without ploughing, the seed was sown broad cast, and the surface merely scratched over with a *babool* branch.

10. The crop is a most promising one, and there is at present every reason to expect an out-turn of 84 maunds of plant, that is, at the rate of 48 maunds per acre, or 30 maunds per beegah.

11. In the rubbee of 1871-72 wheat will be sown in these reclaimed oosur tracts, and report of the result forwarded in due course.

12. I selected a few days ago a plot of most unpromising oosur land near the Poordilnuggur Bridge, and have directed McArther to prepare this land for the next rubbee.

13. An account current showing the outlay and return herewith accompanies.

14. The other experiment referred to was conducted by Mr. Thornhill in the following way. The piece of land operated upon was about a beegah. Trenches four feet apart, two feet wide, and two feet deep were dug, and the trenches filled in with silt. Twenty-four loads of manure were then spread over the surface, and the land was then ploughed several times, watered and sown with indigo. The plant at first came up very thick, but after having been again watered the ground threw up "reh" which completely destroyed the entire crops.

ALLYGHUR DIVISION, GANGES CANAL.

DR. *Valuation Statement of Oosur Field reclaimed, 1870-71 and 1871-72.* CR.

Fusl.	Value of Produce, &c.	Amount.	Total of each Fusl.	Fusl.	Expenditure.	Amount.	Total of each Fusl.
	M. S.	Rs. A. P.	Rs. A. P.			Rs. A. P.	Rs. A. P.
Khurreef, 1870 ...	25 0 Rice (common Soondee) at Rs. 1-4 per maund	31 4 0		Khurreef, 1870 ...	Digging and preparing 1 acre 30 poles ...	64 0 0	
	6 10 Rice, table rice (Lall Dom) at Rs. 2 per maund	12 8 0			Sprinkling above with canal silt ...	3 0 0	
	Rice straw, value	7 0 0			Four days,—two carts carting manure at 8 annas	4 0 0	
			50 12 0		Purchase and planting rice plants ...	10 0 0	
Rubbee, 1870-71 ...	11 20 Barley, at Re. 1 per maund ...	11 8 0			Canal water-rate	2 6 0	
	12 0 Bhoosa, at 4 maunds per rupee ...	3 0 0			Cutting and clearing from straw ...	3 0 0	86 6 0
			14 8 0	Rubbee, 1870-71 ...	Three days plough, at 10 annas ...	1 14 0	
					Purchase seed grain	1 12 0	
					Tending and top-dressing	5 0 0	
					Canal water-rate	1 12 6	
Khurreef, 1871 ...	Estimate 84 maunds Indigo plant, at Rs. 36 per 100 maunds	30 4 0			Cutting and thrashing	3 0 0	13 6 6
			30 4 0	Khurreef, 1871 ...	Purchase indigo seed	1 7 0	
					Sowing, 8 coolies	1 0 0	
					Clearing, 24 coolies	3 0 0	
	TOTAL ...	.....	95 8 0		Water-rate	1 12 6	
	Balance ...	.....	15 8 0		Tending and cutting	4 0 0	11 3 6
	TOTAL ...	.....	111 0 0		TOTAL ...	.....	111 0 0

N. B.—Value of land reclaimed Rs. 32 per acre. The profits of next rubbee's crop will more than clear the account.

B. J. PARSONS, *Captain,*
Executive Engineer, Allyghur Division, Ganges Canal.

SUPPLEMENT TO THE GAZETTE OF INDIA, SEPTEMBER 2, 1871. 1201

Memorandum from R. E. FORREST, Esq., Officiating Joint Secretary to the Government of the North-Western Provinces, to the Officiating Superintending Engineer, Public Works Department,—No. 706 I—C, dated Nynee Tal, the 12th July 1871.

THE undersigned is directed by His Honor the Lieutenant-Governor of the North-Western Provinces to acknowledge the receipt of Officiating Superintending Engineer's letter No. 1996 of the 22nd ultimo, and to request Captain Moncrieff to convey to Captain Parsons the thanks of His Honor for the interesting and intelligent report submitted by him on the results of experiment in the cultivation of "oosur" land in the Allyghur Division, Ganges Canal.

2. A further statement will be looked for of the condition and bearing powers of the successful plot in reference to the ensuing khurreef harvest, how far it continues fertile or shows symptoms of recurring reh and barrenness. No absolute conclusions can be formed till we have had a longer and wider experience. Eventually, if the experiment succeeds, the papers will be published; in the meantime, they will be forwarded to the Government of India for information.

3. His Honor has been pleased to direct that an assignment be made of Rs. 500 from item No. 97 of current year's budget, to enable further experiments being made on a larger scale in the Allyghur and Boolundshuhur Divisions, Ganges Canal; of the sum of Rs. 500 now allotted, Rs. 300 are assigned to the former, and the balance to the latter division.

IRRIGATION OPERATIONS OF LOWER BENGAL UP TO 30th JUNE 1871.

Circle.	Canal.	Water supplied during 1871-72.			Approximate area irrigated during June 1871.			Total of columns 8 and 9 for all previous months of current year.	Total area irrigated up to date during the current year.	Rainfall.			Navigation Return.				Chief Irrigation.		Remar
		Full supply depth.	Estimated full discharge in cubic feet per second.	Average depth throughout the month.	District.	Area actually receiving water during the month, in acres.	Of column 8 area receiving water for the first time during current year.			Inches during the month.	Inches up to date during the year.	Average of ten previous years for the same period.	Nature of Traffic.	Number of Boats.	Tonnage.	Ton mileage.	Approximate value of Goods.	For column 8.	For columns 8 & 9.	
1	2	3	4	5	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Orissa	High Level	8	675	3·62	Cuttack	3,265	3,265	..	3,265	7·44	17·41	15·66	Local Govt.	86	243	2,704	908	Rice	Rice.	
	Kendrapara	7	1,262	4·43	Ditto	2,650	2,650	..	2,650	7·44	17·41	15·66	Local Through Govt.	30	318	7,919	16,301	Rice	Rice	
	Taldunda	8	1,300	6·75	Ditto	500	500	..	500	7·44	17·41	15·66	Local Govt.	128	731	16,040	19,199	Rice	Rice.	192·547 cubic feet per second escape.
														358	2,385	95,423	2,19,964			
														38	426	8,095	139			
														70	252	2,384	1,663			
														157	2,971	41,412	4,680			
South-Western.	Midnapoor	8	875	5·28	Midnapoor	5,963	5,797	166	5,963	9·40	28·30	22·61	Local	97	176	672	3,645	Rice	Rice	Rivers 1 and 3 closed for repairs.
	Panchkoorah	6	240	1·60	....	..	..	..	..	10·65	24·90	Not known.								
					Total	12,378	12,212	166	12,378											
Orissa	High Level	..	..	..	Cuttack	..	..	47	47											
	Kendrapara	..	..	..	Ditto	11	..	2,151	2,151											
	Taldunda	..	..	..	Ditto	..	..	..	..											
South-Western.	Midnapoor	..	..	..	Midnapoor	10,565	10,558	35	10,593											
	Panchkoorah	..	..	..	Midnapoor and Howrah.	..	..	..	..											

NOTE.—Decrease in area of irrigation in Midnapoor owing to the heavy rains, whereas during the month of June last year little rain fell.

T. M. KIRKWOOD, C. S.,
Canal Revenue Supdt., Bengal.

The 1st August 1871.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Conservancy of Forests in Raneekhet.

From MAJOR J. BONUS, R. E., Assistant Secretary to the Government, North-Western Provinces, Public Works Department, Railway Branch, to the Secretary to the Government of India, Public Works Department,—No. 143 F—C, dated Nynee Tal, the 12th August 1871.

IN continuation of this Office No. 103 F—C of the 24th July, I am directed to forward, for the information of the Governor General in Council, copy of a memorandum No. 140 F—C, dated 12th instant, issued to the Conservator of Forests, regarding the conservancy of the Raneekhet forests.

2. The Government of India will observe that in respect of the forests within cantonments limits, the Forest Officer will be merely the adviser of the Cantonment Magistrate and Executive Engineer.

Memorandum from MAJOR J. BONUS, R. E., Assistant Secretary to the Government, North-Western Provinces, Public Works Department, Railway Branch, to the Conservator of Forests, North-Western Provinces,—No. 140 F—C, dated Nynee Tal, the 12th August 1871.

WITH reference to the Notification of the 24th July, placing the forests of Raneekhet within a radius of 12 miles round Koompore Hill under the forest laws, copy of which Notification was sent to Conservator with No. 111 F—C of same date, requests that the Conservator will at once send the Kumaon Forest Officer to Raneekhet to be stationed there, in accordance with the arrangement which was lately discussed between Conservator and Assistant Secretary, and which has received the approval of His Honor the Lieutenant-Governor.

2. Lieutenant Campbell who, it is understood, is the officer in question, should mark out the 12-mile limit at once, and the conservation of the forests within that limit should be strictly enforced so far as the forest lands are concerned, and a map will be prepared in communication with the Commissioner of Kumaon showing the village lands, Troup's estate, and cantonments within the main boundary, and which will be hereafter exempted from the forest laws.

3. The Forest Officer will be responsible for *advising* in all matters within cantonments, but not for the executive charge which will rest in the hands of the Executive Engineer. The latter will act in respect of the forests in cantonments (and also in respect of the Troup estate) in concert with the Cantonment Magistrate and Forest Officer.

From A. O. HUME, ESQ., C. B., Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce, to the Secretary to the Government, North-Western Provinces, Public Works Department,—No. 200, dated Simla, the 31st August 1871.

I AM directed to acknowledge the receipt of your letter No. 143 F—C, dated 12th instant, forwarding a memorandum of instructions to the Conservator of Forests, regarding the conservancy of the Raneekhet forests, and to state that it is the wish of the Governor General in Council that the regulations and restrictions therein prescribed should also be made applicable to the hill called Sir Devi, which lies between Raneekhet and Almorah, and which is approached by the Runi Spur.

Report by the Government Quinologist, Madras, of the results of the analyses of specimens of Cinchona bark sent from Mahableshwur.

From MR. BROUGHTON, Government Quinologist, to the Acting Secretary to the Government of Fort St. George, Revenue Department,—dated Ootacamund, the 14th July 1871.

REFERRING to G. O. No. 1067 of 15th June 1871, I have the honor to state the results of the analyses of two specimens of red bark from Mahableshwur, in order that they may be communicated to the Government of Bombay.

2. The specimens of bark differed in appearance from most of the India grown bark of *C. Succirubra*, by having a thicker corky envelope which had partially scaled off its surface in many places, and thus altering its aspect. This was more especially the case with the elder bark. The analyses are given in percentages of dry bark:

No. I.—C. Succirubra bark, four years' old.

	Per cent.
Total alkaloids	5·95
Quinine	1·06
Quinidine and other alkaloids	4·89
Sulphate of quinine obtained crystalized ...	0·75
Sulphate of quinidine and cinchonidine ...	3·16

No. II.—C. Succirubra bark, three years' old.

	Per cent.
Total alkaloids	5·34
Quinine	0·67
Quinidine and other alkaloids	4·57
Sulphate of quinine obtained crystalized ...	0·39
Sulphate of quinidine and cinchonidine ...	2·48

Hence in gross yield of alkaloid, these barks are of good quality, the elder being of course the better. They bear all the marks of being grown at a lower elevation than those of the Nilgiri plantations. It will be observed that they contain little quinine. The most remarkable quality of the barks is, that they contain but little cinchonidine compared to the usual yield of red barks; that alkaloid being nearly entirely re-placed by quinidine, an alkaloid of somewhat greater value, and not hitherto found in any large quantity in Indian barks. Hence after the quinine is removed, a solution of the sulphates rotates the plane of polarization of a polarized beam to the right. The occurrence of this alkaloid is a circumstance of much interest. Cinchonine is also present, and is excluded from the above statement of crystalline sulphates.

Notes on the Bombycidæ, as at present known to us, by Captain Thomas Hutton, F. G. S., C. M. Z. I., Corresponding Member of the Agricultural Society of India, — dated Mussoorie, the 26th July 1871.

BOMBYCIDÆ.

1. *Bombyx mori.*—(Lin.)—The largest of the domesticated Chinese Bombyces, originally from China, about North Latitude 32° to 34°. Also in Japan. This has been cultivated in Europe, especially in France and Italy, as well as in Syria, Egypt, Persia, Bokhara, Afghanistan, Cashmere, in one or two localities of the Northern Punjab near the hills, and thrives well at Mussoorie, everywhere feeding upon various species of mulberry and everywhere an annual, only *except* at Mussoorie, where I can obtain two crops. This is the worm that lately failed in France after centuries of domestication. It occurs *nowhere in the lowland Gangetic Provinces*, but its name is assigned, in ignorance, to *all* the under-mentioned species. "Where ignorance is bliss, 'tis folly to be wise," and after all, "what's in a name? a rose by any other name would smell as sweet!"

   This species has been introduced into Australia where it is said to thrive well, although Dr. Wallace of Colchester has lately informed me that Australian eggs do not hatch so kindly and regularly in England as English bred eggs; instead of coming forth in a swarm, they appear daily in small quantities only. This I attribute to the high temperature of Australia having acted injuriously upon the constitution, which is debilitated.

   The best silk of all is produced by this species, and readily sells, with good reeling, at 25 shillings per lb. Mr. Cope sold some at that rate which he produced in the Punjab; and that reared at Mussoorie fetched the same price. A splendid silk is produced by crossing this species upon the smaller monthly worm known in Bengal as the *désee*, but the crossing requires great attention, and the out-turn after all may not be worth the trouble, for unless very closely watched and attended to, the worms will invariably revert to annuals. Silk—golden yellow when in health.

2. *Bombyx textor.*—Hutton.—This species is cultivated sparingly in several parts of India, but its constitution is thoroughly worn-out, and it ought to be sent to a hill climate. At Mussoorie it thrives well, and although like the last, an annual everywhere else, here it yields a second or autumnal crop also. It was originally brought from China, near Nankin, in North Latitude 32°, but is fast fading away from Bengal. It is cultivated in France and Italy and in China, as well as in Bengal, and in those countries generally produces a pure white silk; in Italy there are more white than yellow cocoons, but in France more yellow than white; this is dependent upon climate, as is well shown at Mussoorie where worms introduced from Bengal produce *white* cocoons for the first crop, but almost all yellow in the second crop. The worm being northern, is impatient of heat and suffers accordingly in constitution, the silk in consequence becoming white, which, as I have elsewhere pointed out, is generally a sign of loss of constitution, not only among silk-worms, but among animals still higher in the scale of nature; the natural colour of the worm of *Bombyx mori* is nearly black-brindle, whereas the worms under domestication are of a sickly creamy white. So, then, the climate of France being more temperate than that of Italy, produces more yellow than white cocoons. This species is often termed the Milanese or Italian stock, and in Bengal is known as the Burra pooloo, because its cocoon is larger than those of the so-called *désee* worms or polyvoltines.

   It is cultivated in Assam and, according to Dr. Royle, is there and elsewhere called "*Pat* major," although it is invariably confounded with *B. mori*, than which it is at least an inch smaller, though in other respects closely resembling it. The cocoons are of a different texture with more floss. The silk varies in price from 18 to 22 shillings per lb. Unless it be very soon transferred to the hills, this species will certainly die out; here I *could insure its life* without difficulty.

3. *Bombyx Cræsi.*—Hutton.—This is the largest of the monthly worms, and in Bengal passes under the Native name of the Madrassee or Nistry, and is as usual confounded by Europeans with *B. mori*, although the one passes as an annual, and the other as a monthly worm.

   The silk is good, of a golden yellow, and the worms thrive best in a temperate climate; in Assam (*apud* Royle) it is known as "*Pat* minor." This species is cultivated in several parts of India, and thrives well at Mussoorie. It is to be particularly remarked, however, that none of the Chinese species, whether annual or monthly, have hitherto succeeded in the North-Western Provinces, Dr. Royle long since remarking that all the Old Company's Filatures did not extend higher up the country than about 26° of North Latitude, owing to the dry hot nature of the North-Western climates.

4. *Bombyx fortunatus.*—Hutton.—Known to the Bengalees as the *désee* worm, and like the others dignified by Europeans with the name of *B. mori*. Silk—golden yellow, distributed over Bengal and other parts of Southern India; but people know so little of the distinguishing characters of species, that it becomes very difficult to say what species is alluded to in magistrates' reports unless the native name is mentioned. This also is one of the polyvoltines. A sure mark of distinction between the worm of this species and that of any of the others exists in the fact that when near maturity, it becomes of a dull leaden blue color. This species thrives best in the cold weather. It is very small, but yields a good cocoon, although the returns of silk are said to be uncertain; there are no dark worms observable among them. The worm is figured in the second part of my paper "On the Reversion and Restoration of the Silkworm," as published in "The Transactions of the Entomological Society of London"—(*quod vide.*)

5. *Bombyx Sinensis.*—Hutton.—This is known as the "*Sina*" of Bengal, but, like the others, it originally came from China; it is very prolific, and even at Mussoorie goes on yielding crop after crop, up to the middle of December. The cocoons vary in colour, some being white and others yellow, while others even have a beautiful faint greenish hue. These changes clearly show that the health of the worm is becoming impaired. There is a peculiarity about these also which may enable the tyro to distinguish them from any of the others; while all the other species hatch slowly during the morning, from six to twelve o'clock, the *Sina* worms come forth all in a batch, or continue hatching all day and all night.

6. *Bombyx Arracanensis.*—Hutton.—This I have only once been able to procure and the worms died off soon after hatching. The cocoon is said to be larger than those of the Bengal monthlies, but very little beyond the fact of its existence appears to be known,

and people are so apathetic in these matters that letters, as a rule, remain unanswered. As the species is supposed to have been introduced from Burmah, it may probably turn out to be the same as that which was lately reported to exist in Burmah.

7. *Bombyx* ———? I have heard of a species which in Central India is said to yield three crops of silk in the year, and that as soon as they are hatched, the worms are placed out upon mulberry trees and left there until they spin the cocoon. Some of the cocoons were kindly sent to me, but were so crushed in transit that they were destroyed; the cocoons were small, but silk good, of a pale colour and something like those of *B. fortunatus*. I wrote for more cocoons and eggs, but my application has been unattended to, although my correspondent promised to assist me. I shall try again.

The following, with the exception of *B. Huttoni*, are little known. Mr. F. Moore wishes to place them in a separate genus under the name of "*Theophila*," one of his chief characters being the rows of spines on the larvæ; I object, however, to the establishment of this genus, because, in truth, we know little or nothing about them, and as to the spines, two species only are as yet known to possess them; nevertheless, they certainly do not stand properly under the genus *Bombyx*, but we must wait yet awhile in order to ascertain whether all can be included in the same genus.

8. *Bombyx* (Theophila) *Huttoni*.—Westwood.—This is a wild mountain species, feeding on the indigenous mulberry of Simla, Mussoorie, and Almorah. I first discovered it at Simla in 1837, and afterwards in great abundance at Mussoorie. In some years they swarm to such an extent, that by the end of May, the worms of the first, or spring brood, have thoroughly denuded even large forest trees, not leaving a single leaf. In this predicament they quit the tree in search of another which they generally find near at hand, and which is then soon thickly covered with cocoons spun in the leaves; but if, unfortunately, they fail to find a tree at hand, the whole brood perishes, the most forward worms spinning cocoons among shrubs and grass. The trees thus denuded instead of dying, are in another month once more in full leaf, as if nothing had happened.

It is a strong and hardy species, yielding a beautiful soft, whitish silk, and although the worm is too intractable and wandering to be treated in the usual manner in the house, yet I am by no means sure that it cannot be turned to good account by collecting the cocoons from the trees, as was evidently done in the outset by the Chinese with respect to *Bombyx mori*. For a full report I refer the reader to my paper Part II., "On the Reversion and Restoration of the Silk-worm," published in the "Transactions of the Entomological Society of London."

9. *Bombyx* (Theophila) *Bengalensis*—Hutton.—If the species discovered some years ago in Bengal by my friend A. Grote, Esq., is correctly figured in my paper No. 2, just alluded to, then that sent to me from Chota Nagpore in 1869, by Mr. King, must be distinct, for it is in all respects as to shape, colouring, markings, &c., a perfect miniature of *B. Huttoni;* that it is distinct, however, is shown in the smaller size both of larva and imago, as well as in its being a polyvoltine instead of a bivoltine like *B. Huttoni*. In Chota Nagpore the food was the leaf of *Artocarpus Lacoocha*, upon which tree likewise Mr. Grote found his specimens; but as the latter gentleman was in the habit of employing an accurate native delineator of insects, I much doubt any error occurring in the figure kindly supplied by him to me, and therefore am inclined to regard Mr. King's species as distinct from Mr. Grote's, and would term the Chota Nagpore insect *Bombyx* (Theophila) *affinis*, (nob.) in reference to the remarkable affinity to *B. Huttoni*, in all its stages.

10. *B. affinis—Hutton.*—When the young worms hatched at Mussoorie, from eggs and cocoons sent from Chota Nagpore, I had no leaves of *Artocarpus* within some miles and was sadly puzzled to feed the worms; I tried, without success, the leaves of wild fig trees, *ficus venosa, morus nigra, morus sinensis, m. multicaulis, m. cucullata, m. serrata* (wild), but all to no purpose, and I had almost made up my mind to lose the species, when it suddenly occurred to me to try the leaves of *m. indica*. With these I succeeded, the young worms riddling the hard, coarse leaf into a perfect sieve in a few minutes. Like *B. Huttoni*, in the two first stages they were dreadfully troublesome, wandering down from the branches and spreading all over the table, but as they grew larger they became more tractable and remained tolerably quiet, eventually spinning their cocoons in the leaf like *B. Huttoni*.

When the moths appeared, there was equal difficulty in getting them to pair, and then even many of them laid no eggs; those that did so, deposited them in batches and then covered them over thickly with the brush or tuft of hair at the end of the abdomen; thus the eggs of *B. Huttoni* are pale straw colour, glued to the trunk or branches of the tree, and quite naked, whereas those of *B. affinis* are of an orange colour and covered with dark hair. This renders it difficult to

detect them on the bark, and the covering is probably used as a non-conductor of heat. The eggs of *B. Huttoni* are scattered along the under side of the small branches or over the bark of the trunk, whereas those of *B. affinis* are placed in patches or groups, and none of the eggs that remain without a coating of hair ever produce worms. I obtained four broods, the last being reared on the trees of *M. nigra* in the open air. I am sorry to add that none survived the winter, although the cocoons were kept in a room with a fire; thus, after all my trouble, I lost the species. The silk resembles that of *B. Huttoni*, and is equally good, although from the smaller size of the cocoons there is less of it.

Mr. Grote kindly sent me a specimen of his moth which arrived, as usual by post, quite crushed; the specimen, however, as far I can remember, was whitish and very much smaller than that of *B. affinis*.

11. *Bombyx* (Theophila) *subnotatus*.—Walker.—Nothing more is known of this species than is contained in Mr. Walker's description of the moth, and that it was procured from Singapore by Mr. R. A. Wallace; neither the larva nor its food is mentioned.—(*Vide Proc. Linn. Soc. Lond. iii. Zool., p.* 188. (1859.)

Whether this be a true Theophila, we cannot tell.

12. *Bombyx* (Theophila) *Sherwilli*.—Moore.—This is closely allied to *B. Huttoni*, but the larva is unknown; all that has been ascertained is that the specimen was obtained from a collection made by the late Major J. L. Sherwill, but whether captured in the plains or at Darjeeling, no one knows. People who have often collected at Darjeeling assure me they never saw the species there; hence I incline to regard it as a lowlander, feeding on *Artocarpus* perhaps. All that Moore says of it that it is "allied to *B. Huttoni* and differs from it in being somewhat larger, and of a grayer colour, the fore-wing having the apical patch, fuliginous instead of black, and it has only a single transverse discal streak (instead of the two as in *B. Huttoni*). A most prominent character is that the abdomen is tipt with black, as well as having the dark waistband."

13. *Bombyx* (*Ocinara*) *religiosæ*.—Helfer.—Although this stands as a Bombyx, the entire description as given by Dr. Helfer applies rather to a species of *Ocinara*. It is called the Joree silk-worm by Helfer, and the Deo-mooga silk-worm by Mr. Hugon. It is said to occur in Assam and Sylhet; but I have failed to elicit information from those localities. Bombyces are far less erratic than the allied genera of *Theophila* and *Ocinara*, and if indigenous in any district, there they will remain year after year, sometimes in greater, sometimes in lesser, numbers; but *Theophila* and *Ocinara* are both inconstant; plentiful one year, absent altogether the next, and with the latter sometimes for two or three years. Hence Grote for or four or five years lost sight of *Theophila Bengalensis*, and no one seems to have seen Helfer's *B. religiosæ* since the time of its discovery.

14. *Ocinara Lida*.—Moore.—This species is found at Mussoorie where it feeds upon the leaves of *Ficus venosa*, the larva being very like that of a geometra, and spinning a small white cocoon on the leaf or against a stone beneath the tree. It is too small to be serviceable. I named it after Mr. F. Moore, but he tells me it is the same as the Javanese O. lida. It is a multivoltine. It feeds on the wild fig also.

15. *Ocinara lactea*.—Hutton.—This also occurs at Mussoorie, feeding on *Ficus venosa* and spins a curious little cocoon of a yellow color, within the leaf; over the cocoon is laid a net-work of yellow silk, too small to be of use. It has several broods during the summer. The larva is smooth, whereas that of the preceding is hairy.

16. *Ocinara comma*.—Hutton.—The moth of this is white, with a dark comma-shaped mark on the disc of the upper wings; hence the name. It occurs both in the Doon and at about 5,500 feet of elevation below Mussoorie.

17. *Trilocha variana*.—Moore—Is a small species found in Canara; and again by Mr. Grote in Calcutta. As a silk-yielder, it is of no value.

For further remarks on these species, consult the second part of my paper "On the Reversion and Restoration of the Silkworm."

18. *Cricula trifenestrata*.—This handsome and curious species is found in various parts of India, sometimes in such numbers in the larva state as to become a perfectly destructive pest; it denudes the mango trees of every leaf, destroys the foliage of the cashew-nut, and is even said to attack the tea plants. It occurs in Burmah, Assam, Moulmein, and Chota Nagpore in Central India. The cocoons are formed in clusters, so closely interwoven, that they cannot be separated for reeling, which, indeed, their very texture prohibits; they are therefore carded, but are not much used; the

cocoons are very irritating, from a number of minute bristly hairs from the caterpillars. I am inclined to think there are two species now standing under this name: as some cocoons are very much reticulated, while those from other localities are far more closely-woven and scarcely reticulated at all. This will never prove productive as a silk-yielder, unless the cocoons can be reduced to a gummy pulp, and used for some other purposes.

19.—*Antheræa paphia.*—Linn.—This handsome species is distributed all over India from Burmah to Bombay; but it has to be observed that there are in this wide range several distinct species included under the name. To separate these effectually must be the work of time, and until it is done, there can no really good Tusseh silk be produced. That several of these species are capable of producing a very valuable article of commerce is an undoubted fact, and from its cheapness and durability it would be a boon to that class of the British population which cannot afford to indulge in expensive silks. There is a stupid outcry against Tusseh silk now raised at home by some of the would-be-knowing ones, who are quite ignorant of the fact that they are not sitting in judgment upon a genuine article, but upon one compounded by the natives by the mixture of the silks of three, if not four, distinct species whose fibres are of different thickness. Take the silk of any one un-crossed species and reel it as carefully as is done with the produce of the Chinese Bombyces, and these cavilling quidnuncs who do not know one species from another, would soon sing to a different tune.

At present the native method is this: At the season when the cocoons have been formed, the jungles swarm with them, and men sally forth to pluck them from the trees. These jungles, however, contain several distinct species, a thing of which the natives are profoundly ignorant; these cocoons are all promiscuously huddled together, placed in hackeries, and carted off to the dealers. They are then sorted according to size, thickness, colour, &c., and named accordingly as a kind of trade mark, but without any reference to species. The cocoons selected for reeling are treated in the roughest manner and all kinds spun off together; those that are kept for breeding are allowed to eat out of the cocoon, as it is termed, and to interbreed, still without reference to species; and as this has been going on from time immemorial, of course the species have become blended into a most confusing cross-breed. Hence it results that if a dozen cocoons are taken at random, no two moths will probably resemble each other.

This system of crossing is not confined to the Tusseh group. I have detected it more than once in what were termed Japan worms imported direct from that island; indeed, I have not only detected the cross, but I have succeeded in separating the species which composed it; in one instance, I found *Bombyx mori* crossed with *B. Sinensis*, and on another occasion *B. Textor* and *B. Sinensis*. In the case of domesticated species there is no great difficulty to contend with, but with regard to the wild species the thing is very different, and, in short, I can scarcely yet say that I see my way at all clearly. In the Dehra Dhoon and extending up the hill side to about 4,500 feet, or perhaps more, we have two species of Tusseh, one of which is also found in Central India; what the other is, I am not yet prepared to say. Here, however, we have no artificial crossing, so that our species may be regarded as types. The difficulty is to get the sexes of two moths showing marks of relationship to come forth at the same time, so as to obtain a brood and compare the larvæ with others. To trust to the reports of the unscientific would only add to the confusion; a gentleman residing in one of these silk districts kindly furnished me with cocoons of what he declared to be distinct species, and furnished me with voluminous notes, but neither the one nor the other furnish the slightest data upon which I can work or depend; that a cross exists I can see, but my correspondent is not able to enter into my views and wishes. To visit the jungles myself at the season when the worms appear is out of the question, and the cocoons afford no information. Nevertheless, I shall continue to collect hints from all who may be kind enough to give them.

20. *Antheræa nebulosa.*—Hutton.—This is one of the species that has been crossed upon *A. Paphia*, and it seems to be not uncommon throughout Central India. It is a well marked species, and as specimens have been sent to England, we shall soon hear what the opinion is, provided the moths arrive in safety. The silk would probably rival that of *A. Paphia.*

21. *Antheræa* ———?—I refrain from naming this until I can obtain more specimens; it is found in Central India and in the Dehra Dhoon. It is quite distinct from either of the foregoing.

22. *Antheræa Pernyi.*—Guér. Mén.—This species was discovered in Mantchouria to the north of China, where it feeds on the oak. According to Mr. Atkinson, of the Educational Department, Calcutta, he has captured two specimens of what he declares to be this species, at Darjeeling; these flew to a light placed out in the evening, but nothing further was ascertained. The great difference between the climates of Darjeeling and Mantchouria calls especial attention to this discovery, and leads one to wonder that the species has not been detected at Mussoorie and Simla, both farther to the north. It would be as well if Mr. Atkinson would give his attention to the subject, and enable us to bring it under cultivation.

23. *Antheræa Yamamai.*—Guér. Mén.—This is a Japan species and is well thought of both in England and in France where great efforts have been made to introduce it, but as yet with very indifferent success. Last year I received through the kind offices of Dr. Wallace an ounce of these eggs direct from Japan, and found them to thrive admirably on our hill oak; unfortunately my means were not adequate to the undertaking, as gauze covers were found to be indispensable in order to ward off the attacks of insects, such as bugs, the larvæ of coccinallæ, spiders, &c., and as some of the young trees were about six feet in height, the expense was greater than I cared to undertake, as I was certain of no reward. However, the experiment was suddenly cut short in one night when the worms were in the fourth stage, by the incursion from below of a swarm of large black ants which carried off every one, so that like Lord Ullin, "I was left lamenting." The species however is well worth another trial if only for my own amusement.

21. *Antheræa Assama.*—This is the Mooga or Moongah worm of Assam which produces a very excellent silk, which, if well reeled by skilful hands, instead of being carded, would be extremely valuable. I have found this species in the Dehra Doon feeding upon a tree known to the natives as "*Kirkee,*" but I only procured one male and have not since seen another. I am searching for it, as there must be more than one.

22. *Antheræa Perrottetti.*—Guér. Mén.—Said to occur at Pondicherry, but although I long ago applied to the late Mr. Perrottet, he could not procure any specimen of it, although he sent *Antheræa paphia* (vera) and Actias Selene.

I am half inclined to regard it as a mere variety of *A. Paphia.*

23. *Antheræa Helferi*—Is found at Darjeeling, the cocoon resembling that of the common Tussch; but no one seems inclined to do more in those regions than collect the moths.

24. *Antheræa Frithi*—Is another Darjeeling species, of which we know no more than of the last. At that station, where species are abundant, no one ever does more than collect the imago.

25. *Antheræa Royle*—Moore.—Is common at Simla, Mussoorie, Almorah, and, I think, Darjeeling. It feeds upon the common hill oak, spinning a large but thin cocoon between three or four leaves. I found it at Simla in the winter of 1836 by following a flock of tomtits, one of which, after a time, began tapping so loudly that I hastened to the spot and found the little fellow hard at work on the outer cocoon from which I drove him off and pocketed the prize. The outer coating is very strong, and I do not think it could be reeled; but within this case is the true cocoon, of an oval form and yielding a good silk. The worms are easily reared, and sometimes give two or three crops, but this is when treated in the house.

The males will couple with *Antheræa Paphia*, but the produce never comes to anything.

26. *Antheræa* ———?—This is a species occurring near Bombay and discovered by the Messrs. Robertson, of the Civil Service, who regard it as allied to *A. Yamamai* of Japan. They have very kindly promised to send me cocoons as soon as procurable. From the rough sketch of the cocoon which Mr. E. P. Robertson sent me, it certainly appears to differ from *A. Paphia*, though I do not think it can possibly be *A. Yamamai.*

27. *Antheræa* ———?—Nothing is known of this species, except that I possess a well formed (probably male) cocoon of about the size of one of the *Bombyx mori*; the peculiarity exists in there being no vestige of a pedicle or safety rope, the cocoon being equally perfect at both ends. Unfortunately, during repeated illnesses, the label has been lost, and I have not the least recollection of where it came from or who sent it, although I incline to think it came from Madras through the kind offices of Mr. A. H. Blechynden. I am particularly anxious to obtain living specimens of this which is not only an undescribed species, but promises to be a valuable silk-yielder.

These remarks will serve to show how much scientific work yet remains to be done in this single genus of *Antheræa.*

28. *Attacus Atlas.*—Linn.—This the largest of the real silk spinners. Is common at 5,500 feet at Mussoorie and in the Dehra Doon; it is found also in some of the deep warm glens of the outer hills. It is also common at Almorah where the larva feeds almost exclusively upon the "*Kilmorah*" bush or *Berberis Asiatica*; while at Mussoorie it will not

touch that plant but feeds exclusively upon the large milky leaves of *Falconeria insignis*. The worm is perhaps more easily reared than any other of the wild Bombycidæ, producing a very large and well-stuffed cocoon of a grey colour and somewhat difficult to unwind; a strong ley of potash appears to be the best solvent. The species is also abundant in Cachar, Sylhet, and is found also at Akyab, in Arracan, as well as in China.

29. *Attacus Edwardsi*.—This species was discovered at Darjeeling and is much darker in colour than the other, and rather smaller in size, but nothing seems to be known of its food and silk.

30. *Attacus Cynthia*.—Abundant at Mussoorie, feeding on various wild plants; common in China where it feeds on *Ailanthus glandulosa;* found in Assam, Cachar, Saugor. Although it is commonly reported to be under cultivation in different places (*vide* Colonel Agnew's Assam Report), yet such is not the case, the *Attacus ricini* being in India invariably mistaken for it. Indeed until a few years ago, when I pointed out the fact, *Attacus Cynthia* was not known to occur in India, the other species passing under that name, as the silk-worms did under that of *B. mori*. *Attacus Cynthia* has been imported into France and England and reared out in the open air on trees of *Ailanthus glandulosa;* it has likewise succeeded to some extent in Australia, and I believe they have it also at the Cape of Good Hope. There are difficulties attending the reeling of the silk as there is with all the *Attaci*, but nevertheless the French have succeeded in turning out some very good silk pieces. In England it is not quite so highly thought of as it once was. In Australia Mr. C. Brady has produced silk from it.

31. *Attacus Ricini*.—This is the worm that produces the silk known to the natives as the Arrindy silk; it is easily reared and feeds on the castor oil plant *Ricinus communis*. The silk is obtained by carding. The chief places of cultivation are Assam, Rungpore, and Dinagepore, in Eastern Bengal, *not at Dinapore*, as stated in one of Dr. Bennett's reports. It is also cultivated in smaller quantities in other places. The Mekirs to the eastward possess a very fine kind with white silk. *Attacus ricini* thrives well at Mussoorie, and has been introduced into France, Algeria, Malta, and other places.

32. *Attacus Guerini*—Moore.—Is known only from a few specimens of the moth in some museum in England, and I am induced to regard it as no more than an ill-fed specimen of *A. Ricini*. I have failed to procure it from any part of the country, though I have seen an approach to it in ill-fed specimens of the former in my own trays. This underfeeding, or semi-starvation is well exemplified in some very Lilliputian specimens of *Actias Selene*, received from a gentleman who reared it at Serampore, near Calcutta, where he only supplied the worms with food *twice a day;* the moths are only a quarter of the natural size.

33. *Actias Selene*—Very common in a wild state at Mussoorie, where it feeds on the wild cherry, wild pear, walnut, cedrela paniculata, coriaria nipalensis, and several other forest trees and shrubs. It occurs also at Almorah, Darjeeling, Assam, Cachar, Saugor, and at Serampore, near Calcutta. Mr. C. Turnbull failed to reel silk from the cocoons sent down from this, but it has been reeled, though there is not much of it.

34. *Actias Mænas*.—Doubleday—Occurs at Darjeeling and is a very large species, but nothing has been recorded of its habits, food, or produce.

35. *Actias Leto*—Is another Darjeeling species, the economy of which has yet to be ascertained.

36. *Saturnia pyretorum*—Occurs at Darjeeling and Cachar, but nothing more is known of it.

37. *Saturnia Grotei*.—Has been found at Darjeeling, and one or two specimens have been captured at Mussoorie, but collectors of moths make no inquiries as to economy, and for all practical purposes the species might as well remain unknown. I am inclined to think that the larva feeds on the wild pear tree (*Pyrus Kytul?*)

38. *Saturnia Lindia*—Moore.—Of this nothing more is known than that it occurred in a collection made by the late Captain James Lind Sherwill, and is supposed to be from Darjeeling or its neighbourhood. It is allied to *Saturnia Grotei*.

39. *Saturnia Cidosa*—Moore.—From Captain J. L. Sherwill's collection also, and from North-Eastern India, but we have no information regarding it. From its being closely allied to *Saturnia pyretorum*, I should be inclined to suppose it an inhabitant of Darjeeling or Cachar.

40. *Neoris Huttoni*—Moore.—Found by myself at Mussoorie at about 6,500 feet of elevation, feeding on the wild pear tree. The larvæ are to be found in April. The cocoon is an open net-work, and would produce no silk.

41. *Caligula Simla*—Occurs at Simla, Mussoorie, and in Kumaon, feeding on the walnut, salix Babylonica, wild pear tree, &c., but the cocoon is a mere coarse open net-work through which the pupa is visible, and yields no silk.

42. *Caligula Thibeta*—Occurs at Mussoorie, where I have taken it on andromeda ovalifolia, wild pear, and common quince. It occurs also in Kumaon, but the specific name is a misnomer, the insect never approaching Thibet. Specimens were taken out of a collection made in Kumaon, and because the collector travelled into Thibet it was ridiculously enough called a Thibetan collection, and the species named accordingly. The cocoon is a coarse open net-work through which the larva is visible, but there is no available silk.

43. *Loepa Katinka*.—West.—A very beautiful yellow moth discovered originally in Assam, occurring also, according to my ideas, at Mussoorie. Mr. Moore, however, considers mine as distinct. I am not quite satisfied that the cocoon will not yield silk, but there is very little of it.

44. *Loepa Sivalica*.—Hutton.—Closely allied to the last, and found at Mussoorie at about 5,500 feet and lower. It will probably yield a small quantity of silk.

45. *Loepa Miranda*.—Atkinson.—Found by him at Darjeeling; a good and handsome species, but nothing more is recorded of it.

46. *Loepa Sikkimensis*.—Atkinson.—A very beautiful species found by Mr. Atkinson at Darjeeling. It may be known from the others, by the smaller size, and by the wings being clouded with maroon. Of its economy, nothing is known.

Three or four other species of this family occur in Darjeeling and Sylhet, but beyond their existence, nothing is recorded.

Those species which like *Actias selene* and *Antheræa paphia* weave strong compact cocoons perfectly closed at both ends, are furnished on each shoulder with a hard wing spur for the purpose of separating the fibres when the moth is ready to come forth; it may be heard grating against the silk and the point may often be seen protruding. It is common to the genera *Actias* and *Antheræa*, and was discovered by myself.

In *Attacus*, *Neoris*, and *Loepa*, the upper end of the cocoon is left open, the fibres pointing forward closely arranged, like the fine wires of a mouse-trap. No spine is needed in these *genera*.

In *Bombyx* and others, although the cocoons are entire, the silk is loosely woven, and the fibres being moistened by an acid from the mouth, are then easily separated by the claws on the fore-feet of the moths.

This is about the state and extent of our knowledge of the *Bombycidæ* of India; that there are many other species yet to be discovered, no naturalist will think of denying. Nature is the book through which the Almighty teaches man to look from earth to heaven, and as His works and knowledge are boundless, so has this beautifully illustrated book no end.

MUSSOORIE;
The 26th July 1871.

THOMAS HUTTON.

Extract from the Proceedings of the Government of India in the Department of Agriculture, Revenue, and Commerce,—Nos. 61-80, *dated Simla, the* 31*st August* 1871.

READ again the following papers:

Demi-official letters to Local Governments and Administrations, dated 23rd June and 5th August 1871,
From Government of the Punjab, No. 1213, dated 8th July 1871.
To " " No. 47, dated 3rd August 1871.
Despatch to Secretary of State, No. 1, dated 3rd August 1871.
Demi-official letter to Honorary Secretary, Silk Supply Association, dated 24th August 1871.
From Government of Bengal, No. 2996, dated 10th August 1871.
From " " No. 2512, dated 22nd August 1871.
From Government of Bombay, No. 2998, dated 22nd August 1871.
From Chief Commissioner of Oudh, No. 3933, dated 23rd August 1871.

Read also a paper by Captain T. Hutton, Corresponding Member of the Agricultural and Horticultural Society of Bengal, containing notes on the Indian Bombycidæ, dated 26th July 1871.

OBSERVATIONS.—The Government of India has been recently endeavouring to acquire full information as to the present state and prospects and past history of the Indian silk trade, in view to ascertaining the best practical methods of developing it, and improving sericulture generally in India.

2. Amongst other papers received from various sources, Captain Hutton has forwarded a paper on the Indian and Asiatic species of the Bombycidæ, to which it seems desirable to give early publicity.

3. Much, it is believed, may be done towards both increasing and improving the silk produce of India; but one of the first essentials to any successful action in these directions is complete information as to all that has yet been done, or attempted in India in this matter. A good deal of useful information has been gleaned from the records of the Government of India, and some few papers have been received from Local Governments and private individuals; but much more is, it is believed, available, which His Excellency the Governor General in Council is anxious to obtain, and in the collection of which he would invite the co-operation of the public generally and all Government officers.

ORDER.—Ordered, that this Resolution and Captain Hutton's Notes on the Indian Bombycidæ, be published in the Supplement to the *Gazette of India*, and that the several Local Governments and Administrations, the public generally, and all Government officials, be invited to furnish the Government of India in the Department of Agriculture, Revenue, and Commerce, with any information (whether in print or in original manuscript) of which they may be in possession in regard to sericulture in India and the Indian silk trade, past and present.

Ordered also, that the thanks of the Government of India be conveyed to Captain Hutton for his monographic sketch of the Indian Bombycidæ.

Ordered also, that a copy of this Resolution and of Captain Hutton's Notes on the Indian Bombycidæ be forwarded to the Local Governments and Administrations noted in the margin; to the Chambers of Commerce, Madras, Bombay, and Bengal; to the Agricultural and Horticultural Societies of Madras, Bombay, Bengal, the Punjab, and Oudh, and to Captain Hutton.

Government of Madras.	Chief Commissioner of Oudh.
" " Bombay.	" " Central Provinces.
" " Bengal.	" " British Burmah.
" " N. W. Provinces.	" " Mysore and Coorg.
" " Punjab.	Resident at Hyderabad.

(True Extract,)

A. O. HUME,
Secretary to the Govt. of India.

Latest reports on the state of the weather and prospects of the harvest.

GENERALLY the prospects of the harvest throughout India, as far as reported, are not unfavorable.

In the Lower Provinces there have been floods in the Districts lying on the Ganges, Bhagiruttee and Matabangah, as also in Midnapore, and some Districts have suffered much injury. But, on the 31st August, the floods were reported to be everywhere subsiding, and, wherever there had been no flood, the crops were good and food cheap.

In a portion of the Bombay Presidency, and especially in Sholapore, the crops have suffered from drought. A loan of Rs. 10,000 has been authorised for the relief of the poorer classes in Sholapore. It is hoped that the heavy rain of the 29th ultimo may have a good effect.

The prospect in the Berars depends on the continuance of the rain-fall. Reports at short intervals have been called for. In other Provinces there is no cause for present anxiety, though a prolonged cessation of rain would undoubtedly be dangerous.

The following statement exhibits in detail the latest accounts received.

P. S.—The prospects in Sholapore by the latest report appended to the table are brightening.

No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Rain-fall for week. Week ending	Rain-fall for week. Inches.	Date of despatch from Local Government or Administration.	State of Agricultural Prospects.	Remarks by Local Government or Administration.
1	Berar	East Berar: Ellichpore	.....	...	.....	...	August 30	Cotton crops safe as yet, grain crops on high grounds commenced to wither; but heavy rain now falling, seems likely to continue. If so, all will be well.	
		East Berar: Woon	.....	0·1	.....	...	"		
		East Berar: Oomrawuttee	.....	0·14	.....	...	"		
		West Berar: Akola	August 30	0·23	.....	...	"	Prospects of season worse than previously reported. Nothing but a good and immediate fall of rain can save even a portion of the autumn crops, while sowings for the rubbee will be impossible. There is no water in the streams, and no fodder left for the cattle in the plains.	
		West Berar: Ditto	31	1·*	.....	...	"	Harvest prospects brighter than last reported, but a continuance necessary to do permanent good	* Rain-fall on the 30th only.
2	Mysore	Bangalore	29	2·	.....	...	"	Crop prospects threatened by want of rain, but now improved.	Recent rain will, it is hoped, rescue crops which were everywhere suffering from unusual intermission of rain.
		Mysore	28	·92	.....	...	"	Crops suffering from drought.	
		Coorg	28	3·5	.....	...	"	Rice and coffee crops affected injuriously by break in monsoons.	
3	Central India	Indore	30	·4	.....	...	"	Good.	
		Gwalior		9·1	.....	...	31	Favorable.	
		Butlam		·63	.....	...	"	Good.	
		West Malwa		†	.....	...	"	Weather continues favorable for crops.	Cattle disease prevalent at Sohawul. † Heavy.
		Sutna					"		
		Baghelkund					"		

No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Rain-fall for week.		Date of dispatch from Local Government or Administration.	State of Agricultural Prospects.	Remarks by Local Government or Administration.
					Week ending	Inches.			
4	Punjab*	Delhi	August 30	5·9	.....	...	August 31	Crops flourishing.	
		Jullundhur	„	0·5	.....	...	„	Crops on unirrigated lands want rain.	
		Lahore	„	*Nil*	.....	...	„	Crops on unirrigated land lost for want of rain. Bari Doab Canal now flowing, but supply small and irregular. Much loss was caused by its stoppage.	* Rain much wanted throughout the greater part of the Province at this critical season, but harvest prospects are good in Delhi and Umballa Divisions, and in submontane Districts generally.
		Multan	„	*Nil*	.....	...	...	Crops generally good, but have suffered somewhat from river inundation in Tahsils Mylsi, Lodhron, Shujabad, and Serai Sidhoo. On unirrigated lands in Serai Sidhoo crops are not as good as usual for want of rain. Indigo crops have suffered slightly from want of canal water.	
		Rawul Pindee	„	*Nil*	.....	...	...	Crops still good, but rain wanted.	
		Peshawur	„	*Nil*	.....	...	...	Crops good.	
		Raipur	„ 25	1·13	.....	.....	August 31	Crops doing well, but rice on high lands suffering from long break. In Belaspur and Sambalpur more rain has fallen. Rice corps promising well; cotton somewhat injured by rain.	
		Jabalpur	„ 30	1·97	.....	.....	„	Present prospects good, but more rain now wanted. Rice prospects in Damoh and Seoni good. In Mandla more rain wanted. Jawar and cotton suffered from rain in Damoh and Seoni, but are recovering in Seoni.	
5	Central Provinces	Nagpur	„	·3	.....	.....	„	Prospects decidedly favorable in Nagpur, Bhandara, and Balaghât. Good in Wardah, but rain wanted.	
		Hoshangabad	„	3·3	.....	.....	„	Prospects at Hoshangabad and Nursingpur good. Cotton and jawar on low land somewhat injured. Fair weather doing good at Hurda. Rain much required. In Nimar rain much needed. Rice crops nearly failed, and other crops wanted rain. Nimar prospects gloomy. Betul estimated yield of crops three-fourths of average.	
6	Sind	.....	„ 31	*	.....	.....	„	Good.	* No rain up to 30th. Since last report Indus flood 17 feet, unusually high. Some fear of river flood in northern talookas. People and cattle healthy.
7	N. W. Provinces	Benares	.....	53·†	.....	.....	„	Rice crop better for sun; ploughing begun.	† No rain since 23rd.
		Agra	.....	20·	.....	.....	„	Crops benefited by sun.	
		Bareilly	.....	45·	.....	.....	„	Crops fair.	
		Meerut	.....	‡	.....	.....	„	Crops average.	‡ None.
8	Oudh	Lucknow	August 31	1·4§	.....	.....	„	Favorable ...	§ Not too much rain.
		Fyzabad	„ 30	6·9	.....	.....	„	Mash sowings stopped by heavy rains. Rice, kodo, jawar ripening.	Chief Commissioner on 31st considers prospects good.
9	Rajpootana	Serohie	„ 26	‖	.....	.....	„	Unfavorable.	‖ Total this season 6·72. Much wanted.
		Meywar	„	...	.....	.....	„	Prospects very good if rain falls soon.	Total 13 inches.
		Deolee	„ 19	3·6	.....	.....	„	Prospects good.	Total 53 inches.
		Kotah	„	4·2	.....	.....	„	Prospects fair; dry weather required.	Total 36·2 inches.
		Ajmere	„	·05	.....	.....	„	Prospects satisfactory; sowing recommended.	Total 14·1.
		Jeypore	„	·08	.....	.....	„	Prospects favorable.	Total 24 inches.
		Ulwur	„	2·8	.....	.....	„	Prospects good; break required.	Total not registered correctly.
		Marwar	„	.....	.....	.....	„	Prospects promising.	Total 5·75 inches.
		Jeysulmere	.....	.....	.....	.....	„	Very good; harvesting.	
		Mullanee	.....	.....	.....	...	...	Very good; harvesting.	
		Bikanere	.....	.....	.....	...	August 31	Fair.	
10	Bombay	Ahmedabad	August 30	·04	.....	.....	„	Good.	
		Kandeish	„	·04	.....	.....	„	Very bad.	
		Poona	„	1·51	.....	.....	„	Generally good.	Rain scanty.
		Dharwar	„	2·43	.....	.....	„	Crops withering, and sowing operations retarded.	The amount of rainfall on the 29th is 2·41. This will save many crops.

BENGAL.—*Date of report, 31st August.*—There have been floods along the Railway in the Patna District. The waters are subsiding, and there has not been much loss. In the rest of the Patna Division there have been occasional floods, but not much harm has been done. The crop prospects are good.

The Monghyr and Bhaugulpore floods have been local but heavy, and have done considerable damage.

There were heavy floods in part of Purneah. The last report says they were subsiding after some destruction of corps.

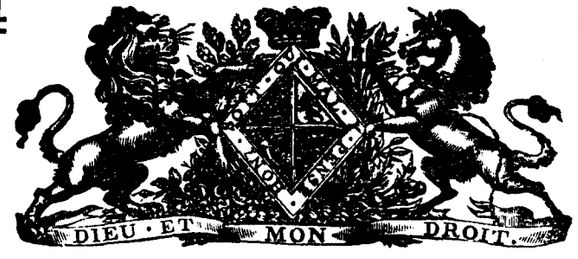
There have been no recent reports from the Rajshahye Division, except Moorshedabad, where there have been heavy and extensive floods from the Bhagiruttee. The embankments have been burst and part of Moorshedabad City inundated. There is some distress, and relief is being given.

Very extensive and continued floods in Nuddea from the Matabangah, and a large area of country is under water. The Eastern Bengal Railway has broken in two or more places. The water was last night (the 30th) over the rail level for two or three miles. Many of the District roads are under water.

An embankment of the Cossye has burst in Midnapore and caused floods. In one or two Districts the damage done is great, but, wherever there is no absolute flood, the crops are good and food is cheap. The latest accounts show that the floods have begun to subside everywhere.

BOMBAY.—*Date of report, 1st September.*—In the Sholapore Collectorate about 1 inch and 73 cents. have fallen within the last three days, and more is threatening. The prospects, hitherto appalling, are now brightening. The price of Jowaree is still at six seers per rupee. Many workmen are being employed.

No. 34 of 1871.



SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, SEPTEMBER 9, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

Non-Subscribers to the GAZETTE *may receive the* SUPPLEMENT *separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.*

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA *is required by Law, of which it has been customary to publish in the* CALCUTTA GAZETTE, *will be included in the* SUPPLEMENT. *For such Orders and Notifications the body of the* GAZETTE *must be looked to.*

GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Tuesday, the 29th August 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding.*

His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.

The Hon'ble John Strachey.

The Hon'ble Sir Richard Temple, K. C. S. I.

The Hon'ble J. Fitzjames Stephen, Q. C.

The Hon'ble B. H. Ellis.

Major-General the Hon'ble H. W. Norman, C. B.

The Hon'ble F. R. Cockerell.

The Hon'ble R. E. Egerton.

CRIMINAL TRIBES BILL.

The Hon'ble MR. STEPHEN asked leave to postpone his motion that the Report of the Select Committee on the Bill for the Registration of Criminal Tribes and Eunuchs be taken into consideration.

Leave was granted.

LOCAL PUBLIC WORKS LOAN BILL.

The Hon'ble MR. STRACHEY presented the Report of the Select Committee on the Bill to facilitate the construction of works of public utility from Local and Municipal Funds.

RAILWAY BILL.

The Hon'ble MR. COCKERELL presented the Report of the Select Committee on the Bill to amend the Railway Act.

LOCAL EXTENT ACTS BILL.

The Hon'ble MR. COCKERELL also introduced the Bill for declaring the local extent of certain Acts passed by the Imperial Legislative Council, and moved that it be referred to a Select Committee with instructions to report in six weeks. He said that, of the ninety-three Acts specified in the schedule, eighty-eight were divisible into the two classes which he described when asking for leave to introduce this Bill,—(1st) Acts which having been enacted previous to 1856—the last year in which any considerable addition was made to the British dominions in India—were never formally extended to the whole of the territories which now constitute 'British India;' and, (2nd), Acts which though intended for general application had no express self-contained definition of their local extent.

In the case of the first of these classes, the Bill was designed to operate as an extending, and in regard to the second, as a mere declaratory, Act. In neither case did it vary the operation of any Act within those territories which had a separate local legislature.

The Bill was not, therefore, as he pointed out on a former occasion, impugnable, on the ground that it would have the effect of narrowing the power now possessed by the several local Councils, of amending or repealing enactments of a date previous to the passing of the Indian Councils' Act of 1861.

The remaining five Acts contained in the schedule constituted the two great Procedure Codes—Civil and Criminal. When enacted, they were made extendible, but were not then extended, to the whole of British India. They have since by various executive orders been gradually extended to all parts of the empire, except the territories referred to in the second section of the Bill. They have consequently been included in the schedule for the purpose of consolidation.

It would be a question for the consideration of the Select Committee to which this Bill might be referred, whether its object might not be attained without the specification of the several Acts contained in the schedule. On the one hand, such detailed specification had its obvious disadvantages, whilst, on the other, by any mere general reference to the Acts to which the Bill related, we ran the risk of failing to get rid of that ambiguity in regard to the intended operation of particular Acts, which this Bill was expressly designed to remove.

The Hon'ble MR. STEPHEN said that the present Bill formed part of the general scheme of simplification of the law with which the Council had been of late so much occupied. No one without actual experience would believe how difficult a task at present it was to ascertain what the law in different parts of the country actually was. First, there was the distinction of Regulation and Non-Regulation Provinces, then there were Non-Regulation Districts in Regulation Provinces; then, again, there were Acts which were of limited application, and there were four distinct legislatures besides the Imperial Parliament, all of which were constantly adding to the existing body of law.

It was, therefore, of the utmost importance that the area to which these various enactments were applicable, should be precisely ascertained. Nothing would be added to the bulk of the existing law; the only object was to let it be clearly known what laws were in force in each part of India. When his hon'ble friend, Mr. Cockerell, to whose labours in this difficult and intricate matter the Council and the public were much indebted, had succeeded in passing the present and one other analogous measure which was now under consideration in Committee, the whole subject would be reduced to absolute simplicity. The various districts which at different times were specially legislated for, or specially excepted, would all be clearly ascertained, and great assistance would, he (MR. STEPHEN) hoped, be given to the regular and speedy administration of the law.

The Motion was put and agreed to.

CIVIL COURTS (OUDH) BILL.

The Hon'ble MR. COCKERELL also moved that the Hon'ble Mr. Ellis be added to the Select Committee on the Bill to consolidate and amend the law relating to the Civil Courts in Oudh.

The Motion was put and agreed to.

The following Select Committee was named:

On the Bill for declaring the local extent of certain Acts passed by the Imperial Legislative Council—The Hon'ble Messrs. Stephen and Egerton and the Mover.

The Council adjourned to Tuesday, the 5th September 1871.

H. S. CUNNINGHAM,
Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

SIMLA;
The 29th August 1871.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Forest Conservancy in Raneekhet.

From MAJOR J. BONUS, R. E., Assistant Secretary to the Government of the North-Western Provinces, Public Works Department, to the Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce,—No. 103F—C, dated Nynee Tal, the 24th July 1871.

IN continuation of former letters on the subject of the cantonment at Raneekhet, I am directed to forward, for the consideration of the Governor General in Council, the accompanying copies of reports* by Dr. King, dated the 15th June and 25th May, together with a copy of the Conservator's letter dated 4th July, covering the latter.

1. Report on Forest Conservancy, &c., at Raneekhet, by Dr. King, Officiating Deputy Conservator.
2. Report on the Fruit, Timber, and Fuel Plantations of Raneekhet, by Dr. King and Mr. Craw.
3. Officiating Conservator's letter submitting the latter report.

2. First as to the report of the 15th June, I am directed to say that this is, in His Honor's opinion, a valuable and exhaustive paper on the subjects

treated, and His Honor commends Dr. King's labours to the favourable notice of the Governor General in Council. The report is all the more creditable to Dr. King, inasmuch as it was made after his nomination by Her Majesty's Government to the superintendentship of the Calcutta Botanical Gardens; it is evidence therefore of the zealous interest taken by him in his former charge.

3. The description of the physical characteristics of the Raneekhet Hill, destined to be so important a station, is clear and interesting.

Opinions vary as to the effect of the local forest and coppage on the springs adjoining. The Lieutenant-Governor is disposed to attach weight to the views of Dr. King (given in paras. 4 and 5 of the report) as to their direct effect in enhancing the water-supply. But even leaving this service out of view, the advantages from the shade and comfort of the foliage at present existing are objects of great importance, and justify extreme care in preserving the existing timber as well as in endeavouring to promote the growth of umbrageous trees wherever the land is at present bare.

4. The correctness of the position laid down by Dr. King in his 6th para., that in forests the preservation of which is desired nothing beyond the annual increase should be removed, is undoubted. It appears to His Honor that this increase within the cantonment and its environs must be very limited, and, with reference to what has been already removed, there should, for the present at least, be an entire prohibition of cutting save in the most exceptional cases noticed in Dr. King's 8th para., and even then only with the sanction of the local Conservator.

5. The necessities of Raneekhet are two-fold,—for building and for fuel.

First, as regards building timber. It is much to be regretted that the forests in the neighbourhood of Raneekhet have suffered so much by the wasteful cutting and burning of the villagers as is witnessed by Dr. King in para. 8. It seems to the Lieutenant-Governor that a local European Conservator, with a sufficient establishment, is essentially required; that the forests should be absolutely under his control, and that he should be armed with the necessary magisterial and police powers to prevent and punish any such depredations for the future. His jurisdiction should extend over a range having a radius of 12 miles from the Kompoor Hill, and no trees should be cut either for building or any other purpose, whether by the people or for the public service, but as indicated by him. A notification will be issued declaring the area above-mentioned, subject to the forest laws.

The Seonee forests are correctly noted by Dr. King as the natural source of supply for Raneekhet, and should be most carefully conserved for this purpose.

6. *Secondly*, with respect to fuel. Hitherto the refuse of trees felled for the Department Public Works, dead wood, &c., have sufficed for the wants of the station. Of the three local sources indicated in Dr. King's 9th para., *viz.*,

(1) refuse of timber used by Department Public Works,
(2) dead trees unfit for building,
(3) stocks of trees cut down,

the third is still considerable. The Commissariat Department has been authorized to use the wood referred to. But Dr. King is of opinion that it will not meet the wants of the cantonment for more than a year or two to come. The Lieutenant-Governor agrees with him that operations for providing a local supply by planting should be vigorously prosecuted; and until a sufficient growth is thus obtained, that fuel should be taken from the forests at a fair distance from the cantonment under careful supervision by the local Conservator.

7. In the recommendation repeated in para. 10, for the absolute prohibition of felling on the Raneekhet Hill, the Lieutenant-Governor has already expressed entire concurrence, and His Honor may add that he also concurs with Dr. King as to the advantage both in respect of shade and grass of evergreen species over the Cheer, and the consequent gain of encouraging the growth of the former even if it be at the expense of the latter. It is assumed that the Cheer is intolerant of evergreens and drives them away; it is accordingly proposed, when the two species interosculate, that the Cheer should be cut out so as to allow the Oaks to flourish and spread. The experiment may be tried, but, in the Lieutenant-Governor's views, very cautiously. It is Colonel Ramsay's experience that where the Cheer alone prevails, it is because the soil is inimical to other species; and we must not, in the hope of superseding the Cheer by other species, run the risk of entirely baring any part of the range. Experiments in planting bare spots with Deodar, Oak, and Australian trees, should however be tried everywhere.

8. Para. 11. Colonel Chamberlain will give vigorous aid to all the operations here contemplated; and it will be well that as regards the cantonment, the forest officers should work in all matters of repression and penalty through the Cantonment Magistrate to avoid any cause for offence or collision.

9. The measure suggested for protecting and fostering natural reproduction, especially in the Seonee range, should have the earliest attention of the local Conservator.

10. The remainder of the report is occupied with proposals regarding the nursery and plantation lands and for establishments.

11. With the former subject the letter of the 25th May (unfortunately delayed in the Conservator's Office) also deals. The site proposed contains about 45 acres, and has been carefully selected (in communication with Captain Birney, Executive Engineer) as to soil and situation, so as not to encroach on any building sites. In the Lieutenant-Governor's opinion it is not too large for the projected operations. It will be ascertained, before work is commenced, that no objections can be raised to the occupation of any part of it for the objects proposed. But even if the ground should be required hereafter for other purposes, it would be easy to resume it.

12. As the season presses, and it is of essential consequence that the young fruit trees be at once planted out, His Honor has, in anticipation of His Excellency in Council's sanction, given permission for the immediate occupation of the land by Mr. Craw for the purpose, and also for the growth of forest seedlings adapted as well for fuel as for building operations. The suggestions in paragraphs 13 and 14 of the report as to the kinds of woods to be encouraged, will no doubt be found very valuable in carrying out this design.

13. In respect of supervision, it is quite impossible that the interests of the cantonment, the surrounding forests, and the nurseries, can be properly secured without the constant attendance of an experienced and well-qualified Conservator. Mr. Craw is the person who possesses the necessary qualifications in the highest degree, and is recommended as such by Dr. King. His services, it will be remembered, are at present secured, but only partially and occasionally, for the nurseries at a remuneration of Rs. 150 per mensem. The Lieutenant-Governor is not aware whether his permanent engagements on his own factory would admit of his taking the appointment; but with the permission of His Excellency in Council, it may be ascertained if he is prepared to do so, and on what terms.

14. The other establishment proposed by Dr. King is also recommended; it would be entertained at the first only experimentally, and would be kept at as low a point as is consistent with efficiency.

15. His Honor the Lieutenant-Governor is persuaded that the necessity for these proposals will commend itself to the Governor General in Council. The future of Raneekhet requires that immediate and energetic measures be adopted for conserving the forests and for establishing plantations and nurseries with the object of providing a plentiful supply of fuel and timber, and also with the view of promoting the growth of useful fruit trees. The expenditure proposed will not appear large when the magnitude and importance of these objects is borne in mind.

16. As these operations are undertaken solely in the interest of the Raneekhet cantonment, the cost will of course be debited to the imperial revenue; the object, moreover, is but little connected with the Forest Branch excepting in the aid its officers are qualified to give. But it is immaterial whether the cost is debited to the military or civil side of the imperial accounts.

Report on Forest Conservancy, &c., for Raneekhet, by G. KING, ESQ., M. B., *Officiating Deputy Conservator of Forests, Kumaon,—dated 15th June* 1871.

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1. *Physical characters.*—The area embraced within the Trigonometrical Survey Map of Raneekhet consists of a comparatively level sketch of hill broken up to some *extent by* ridges and ravines, but much less precipitous in character than the stations of Nynee Tal and Mussoorie. Towards the south and west, the sides of the hill are steep, while northwards and eastwards they slope down gently into the wide valleys of the tributaries of the Kosee River. In physical character, Raneekhet much more resembles Almorah than either of the stations just mentioned, and like Almorah, it is separated from the plains by an outer and higher range of hills. Chiefly, on account of the greatest force of the monsoon spending itself upon this outer range, the rain-fall at Raneekhet is much more moderate, and the natural vegetation much more stunted and scanty than that of the outer or Nynee Tal range.

2. *Geological formation.*—The prevailing rock is a very friable mica schist. Here and there are however interspersed metamorphic strata of harder texture, with occasionally a tendency to slaty fracture. Lime is absent, or nearly so. As a whole, the Raneekhet Hill may be looked upon as a mass of micaceous rock, in which valleys have been worn by the action of the natural drainage.

3. *Soil.*—The soil consists of disintegrated micaceous rock as a basis. On most of the ridges, and on exposed and bare places, this is indeed its only constituent. In other parts where vegetation has been, and now is, dense, and at the bottoms of valleys generally, there is a layer of fine brown loam formed of decayed vegetable matter, and in many cases from 10 to 15 feet in thickness. The present cantonment, the elevation of which is about 6,000 feet above the sea level, lies on a north-eastern slope, and covers ground of which the soil is of the former poverty-stricken description. Oaklands and the higher grounds intended for the civil station, and for the extension of the cantonment, possess, on the other hand, much of the rich loamy soil. But taking the hill as a whole, the poor soil greatly preponderates. The prevailing lightness of the soil, and the porosity of the under-lying rock, render the natural drainage extremely good. Immediately after the heaviest shower, the roads within the station, the pathways in the forest, and even the ploughed fields of the villagers, look as dry as if they had not been rained upon for hours.

4. *Water-supply.*—There is scarcely one of the numerous ravines by which the hill is furrowed that does not possess its spring of water. These springs are, however, very small indeed; all of them become greatly diminished during the hot weather, while many entirely disappear. Such springs are dependent for their existence on the conservative effect of trees on the moisture of the soil, the roots of which also act as conductors downward of the rain water. Extensive clearings of timber, especially on the higher grounds must, I am sure, sooner or later endanger them.

With one or two exceptions, there is no large spring and no large stream of water on the entire surface of the hill. This is quite what might have been expected from its geological structure, and the station may be characterised as essentially a dry one.

5. *Character of the natural vegetation.*—This cannot be called luxuriant. As a rule, the ridges and higher grounds are covered with a sparse forest of rather poor Cheer (*Pinus Longifolia*) and the bottoms of the valleys with Oak (*Quercus incana*), Rhododendron (*R. Arboreum*) and a variety of shrubs and small trees. The ridges however on the very summit, as at Oaklands and Chanbattia, are exceptional, for they are clothed with oak and Rhododendron to the exclusion of Cheer. There is the closest possible connection between the character of the soil and the forest that covers it. Oak is only found naturally abundant where the soil is good and composed of vegetable loam. Cheer, on the contrary, is rarely found in such localities, but occurs plentifully where the soil is dry, porous, and poor. The ridges at Oaklands and along the summit having, unlike these on other parts of the hill, a good soil, give support to Oak. The relations of the natural vegetation to physical conditions at Raneekhet are so striking, and the plans for future forest conservancy must (to be successful) be moulded so much upon them that even at the risk of being tedious, I shall here refer to them more fully. *Oak forest* grows on good rich soil and is found wherever that abounds, which is usually in the bottoms of valleys. Under the trees there is fresh good grass, and numerous shrubs. The forest is shady, damp, and cool. *Cheer forest* is found on poor light soil, and usually covers all ridges. This tree yields a very light shade, and the forest is dry and hot. Almost the only under-growth is a scanty crop of wiry grass, and there are very few bushes. In fact hardly anything will grow under the shade of Cheer, not even young trees of its own species. The soil is, therefore, comparatively bare and unprotected from the rays of the sun, which bake it to a great depth; the heat collected by the soil during the day being parted with by radiation during the night. It would be, I believe, impossible to settle in how far these differing conditions of soil, temperature, and surface moisture are the cause, and in how far they are the effect of the difference in the character of the forest with which they are associated. There is unmistakeably a reciprocal action. But there is little doubt that the deep vegetable loam of an Oak forest is the product of the decay of the leaves of oak trees that it has formerly supported, and is now supporting; and it is perfectly certain that were the Oaks now cut down, and the shade of their evergreen leaves removed, the rays of the sun would, by beating on the soil, soon affect its moisture and temperature. It is also true that the leaves shed by the Cheer, apart from their liability to be burnt, are too scanty to afford much soil by their decay; and that the poverty of the soil covered by Cheer forest is to some extent assuredly due to this fact. If the two species be left to themselves, Cheer will undoubtedly always beat Oak on poor and dry soil, and finally drive it out. Oak however will grow on barren and dry places if protected from Cheer, as can be seen in many places within the cantonment, and especially along the lines near the bottoms of the valleys where the two trees naturally meet.

In many such situations Cheer was cut down for building purposes a year or two ago, and in consequence of its removal, young oak is springing up vigorously, and old Oak stumps that had been closely cropped by the villagers for cattle fodder are pushing young branches. Oak growing in such barren spots will by the shade it affords, and by the decay of its fallen leaves, in due time effectually fertilize the soil. Without protection from Cheer however, Oak would in such situations become stunted and even get exterminated. Were Oak substituted for Cheer in the cantonment of Raneekhet, and a thick covering of evergreen leaves thus interposed between the sun and the soil, I feel quite certain that the character of the latter, and of the grass born upon it, would be improved, the temperature of the station diminished, and the water supply increased and rendered less precarious.

6. *Natural reproduction of the forest.*—By this I mean the modes by which trees removed by death and other causes, such as felling, are naturally replaced. Trees may be replaced either by new plants springing up from seed, or by young shoots springing up from the stumps of felled ones. This latter mode is known as *coppicing*. One essential to very vigorous natural reproduction in either of these ways, *viz.*, *abundance of moisture*, is, as has been already said, wanting in Raneekhet. Moreover, Cheer does not coppice at all, and Oak and Rhododendron do so only to a limited extent. Except on Oaklands and Chanbattia and in a few of the larger valleys, there is really no very dense or luxuriant forest of these latter trees. The amount of coppice or of naturally sown seedlings in these forests, could

therefore be at best but limited. The Cheer forest, with the exception of that covering one or two slopes below Mr. Troup's middle and upper tea plantation, is everywhere so sparse, and affords so little shade, that the soil is baked and hardened to a degree that must make the germination of self-sown seed very difficult. The number of young Cheer trees is not great; and they are always most vigorous in spots which, though near the forest, are clear of trees. In such situations, probably from the protection afforded to the seedlings by the longer grass, and from the better soil resulting from the free growth of grass, they have a better chance. Whatever, however, may be the natural productivity of any forest, no greater amount of timber can without injury be taken from it annually than it is capable of producing in the course of a year. In other words, nothing in excess of its annual natural increase ought be taken from any forest which it is desired to retain as a forest. This annual increase need not necessarily be removed every year, but may be allowed to accumulate; just as interest on bonds need not be drawn every quarter day, but, if preferred, at the end of certain fixed periods.

7. *Demands upon the Raneekhet forest.*—In addition to many trees cut down by Mr. Troup to clear ground for tea, before the sale of his property to Government, there has been already taken from a forest, by no means extensive or luxuriant, a large quantity of timber for the building of barracks and dwelling houses, besides fuel for the detachment of troops, and for private consumption. The detachment has just been increased to half a regiment, and although I have no official information on the subject, I am led to believe that it is intended that one or two entire European regiments with their women and children, and possibly the office establishments of several (if not all) of the Departments of the Government of India, shall be ultimately stationed at Raneekhet. If such be the case, the erection of more barracks, of a number of dwelling houses, and of a large Native bazaar, will of course become necessary, and timber will have to be provided for these purposes. A proportionate supply of firewood will also be required for such a largely increased population. To give some idea of the amount of fuel that will be required, I may mention that the half regiment of Europeans presently stationed at Raneekhet is being supplied at the rate of about 60,000 maunds per annum. The supply appears to me to be very great, and if two regiments are to be treated on equally liberal terms, all the wood existing in Raneekhet at present will be exhausted.

According to the statistics kindly sent to me by Mr. Ribbentrop, Deputy Conservator of Forests in charge of the Punjab fuel plantations, the consumption of fuel in a hill station is estimated at 2,262 pounds per annum for each European soldier, and 1½ maunds a day for every private dwelling house.

8. *Sources of supply of building timber.*—The building timber used in Raneekhet is almost exclusively Cheer. For the erection of barracks and bazaar, supplies of this timber have hitherto been got by felling the larger trees on the hill, and chiefly within the cantonment limits. A good many young and growing trees have, however, been cut for minor purposes. This is much to be regretted, as unless crooked or otherwise damaged, growing trees should never be cut. There still remain within cantonments a few mature trees which might advantageously be felled; and in the piece of ground which it has been proposed to add to the cantonment, as also on the estate just acquired from Mr. Troup, there are a good many mature trees. All such might be cut with advantage. They will, however, be insufficient for any great amount of building such as is likely to take place. With a view to the supply of building timber for the station, I have examined the forests within a radius of twelve miles from the cantonment. These are everywhere interspersed with villages, the inhabitants of which have by usage acquired a kind of right to cut timber within them for village use, *but for village use only.* Until recently, no supervision whatever was extended to these forests, and the villagers have got into the habit of hewing and hacking and burning in the most ruthless and wanton way, destroying an immense deal more timber than they use. All over these forests fine Cheer logs may be seen rotting, large trees having been originally felled to supply some small domestic demand for timber, which having been met, the remainder was left to decay. Only recently was an establishment of five (5) patrols (Natives) put on by the Forest Department for the protection of these now valuable outlying forests; and since the appointment of these patrols, villagers have been ordered to send requisitions (for such timber as they may require) to the Kumaon Forest Officer, without whose sanction they are directed to cut nothing. Old habits are however not so easily changed, and the villagers do not like the trouble of applying for what they want. The authority of the patrol establishment is frequently set at nought, and trees are cut in defiance of their remonstrances. When they do condescend to send requisitions, the villagers usually ask for many more trees than are necessary, forty trees to build one small house being a common request. I fear they sell most of the timber they cut, and *that* they have no right whatever to do; the only wood ever allowed gratis being for *bonâ fide* village use. More efficient European supervision of the forests is wanted, and also a larger Native establishment. The European in charge of the nurseries and plantations at Raneekhet might be put in charge of these forests also, and no grant of trees should be given to any villager without his personally enquiring into the necessity for the grant, and himself marking any trees that he may decide to give. The forests within the radius

indicated consist, like those of Raneekhet, of Cheer and Oak. With the exception of the forest on the Seonee hill, 10 miles north-west of Raneekhet, and of that on a few of the spurs near it, they are comparatively poor and sparse, consisting of thin stunted trees on bad soil. Here and there are patches of heavy Cheer, suitable for building, but such patches are scattered. Seonee however is really a forest from which much building timber might be taken. It is only 10 miles from the station, and the newly made road to Ramnugger and the plain runs quite close to it. This is by far the best source from which supplies of building Cheer can be drawn, and it should in my opinion be regarded as the natural forest of Raneekhet and conserved accordingly.

9. *Sources of fuel supply.*—Up to the present time all the fuel used in Raneekhet by both troops and private parties has been derived from (1) the dead Cheer wood laying about the forest upon the hills, both inside and outside cantonments, and (2) from the refuse of Cheer trees felled by the Public Works Department for the erection of barracks, &c. All the supplies have been drawn hitherto from the Raneekhet hill, and none from any of those near it. Cheer has been the wood hitherto used, but this makes bad fuel. Being light, soft and resinous, it burns too rapidly; it yields moreover charcoal of very bad quality. Oak and hard non-resinous wood in general make the best and most economical fire-wood. While Cheer is to be regarded as the natural *building timber* of the station, other kinds of trees must be looked to for supplies of fire-wood, and of these naturally occurring in the forests, Oak, Rhododendron and Alder are the chief. The Oaks, however, at present in the Raneekhet forests are too few, and for other reasons, too valuable to be cut for fuel. In fact, the only fuel that can without injury be taken for some years to come from the forest on the hill consists of—

(1) branches and refuse of such mature trees as may be felled for building purposes;

(2) any dead trees that may still remain within the forests, the wood of which is unfit for building,—such trees are but few in number;

(3) all the stumps and roots of trees that have been cut,—from this source a considerable supply may be derived, and I have recommended that the Commissariat Department be allowed to remove these to meet present demands.

The supply obtainable from these sources cannot do more than meet the wants of a year or two. It is therefore imperative that immediate steps be taken to begin fuel plantations upon the hill, and that after the three sources just indicated have been exhausted, and until the plantations be ready to yield, supplies be drawn from the neighbouring forests under proper arrangement and supervision.

10. *Felling on Raneekhet Hill.*—I cannot express in too strong terms my conviction that felling operations upon Raneekhet Hill have already nearly reached their legitimate limits, and that if it is desirable to keep the hill covered with trees, further cutting ought to be most carefully conducted. In my opinion, only the mature trees (that is, such trees as have attained their full growth) ought to be cut; no half-grown or young trees ought on any account to be felled, except those to be subsequently indicated. All mature trees intended for felling ought to be marked, and on account of their influence on the water-supply none ought to be so marked that stand on the top of ridges, at the heads of ravines, or near the sources of springs. As soon as all the selected mature trees have been removed, the forests ought, as regards cutting, to be absolutely and entirely closed, and illicit felling ought to be visited with severe penalties. All *dead* and *dying* Oak, Rhododendron, and other like trees, and all stumps might be removed for fuel; but after their removal every kind of ever-green tree on the hill should be preserved as rigorously as Cheer. These measures I recommend on sanitary grounds as well as matters of forest conservancy. The natural reproductive powers of the forests are so limited that a year or two more of indiscriminate cutting of timber for building and fuel would reduce these forests to a condition that would be but the beginning of their complete destruction. The station of Almorah affords an excellent example of the hideous barrenness that results from indiscriminate and excessive felling in a naturally sparse forest on poor soil, while Nynee Tal is an equally good illustration of the effect of judicious conservancy. I feel quite sure that the water-supply of Raneekhet will not continue equal to the wants of the present force stationed there, and far less to those of two regiments, unless the natural timber covering the soil be preserved and even increased. If the hill be cleared of many more trees, the springs will, I believe, disappear, and the temperature of the station will be heightened. With a view of increasing the shade and water-supply, and of reducing the temperature, I would suggest that within cantonments the growth of ever-green trees, and especially of Oak, be encouraged by every means. For this end I would suggest that wherever Oak and Cheer grow together, or near each other, the latter, even though young, should be cut out, so as to allow the Oak to come up. Young trees thus felled would come into use for building the Native bazaar, as small round timber is the very thing wanted for that purpose. Not the least valuable result of exchanging Cheer for Oak forest would be, as was

pointed out to me by Colonel Chamberlain, Cantonment Magistrate, the increased supply of grass, an extremely important consideration in a large station, whereas in Raneekhet food for horses is both hard and scarce. I would also suggest that every bare spot should be planted with trees yielding fuel or building timber, *and shade as well*,—such as Deodar, Oak, Australian gum trees and acacias.

11. *General scheme for conservancy.*—The forest within cantonment limits is at present under the charge of the Cantonment Magistrate, and I think the arrangement might with advantage be continued. Colonel Chamberlain's enthusiasm and great practical knowledge of gardening would be most valuable in carrying out plantation schemes within cantonments, and he could be supplied with seedlings from the forest nurseries. The forest on the piece of ground proposed to be added to the cantonment, as well as that upon the land just acquired from Mr. Troup, are at present under the charge of the Executive Engineer, who cuts in them such trees as may be required for the Public Works Department. If a Forest Officer be appointed in connection with the nurseries and plantations, it might be better to make these forests over to him, as he would have more leisure to look after them than the already overburdened Executive Engineer. In the meantime, the present Executive Engineer is responsible that none but mature trees in proper sites are marked for felling. The Forest Department has at present no charge of any forests on Raneekhet hill itself, but only of those outside the hill and within the 12 miles radius. But these latter have not as yet been regularly taken up and gazetted as forests. This ought to be done as soon as possible, and they should be put regularly under the Forest Department, so that no villager may have power to fell timber for any purpose without sanction of the Forest Officer, who ought to mark all trees given to villagers. These people invariably want to get small trees for their buildings, because the expense of sawing into small scantlings is thereby saved. As a rule, full-grown trees alone should be given to them, and saplings only where it is for the advantage of the forest that such be thinned out. The selection of trees to be given to villagers or even to the Public Works Department ought never to be left to an uneducated Native. A Forest Officer who has some idea of the work should invariably decide upon each tree that is to be marked for felling. Villagers ought to be directed to send in their requisitions at certain fixed dates, once a year or oftener, so as to prevent the necessity for endless inspections by the Forest Officer.

Natural re-production by seed should be encouraged in the following ways:

(1).—By the closure of the forests to cattle. The injury done by grazing is not to be measured merely by the ravages of the cattle themselves (and these are not inconsiderable, for a buffaloe is quite capable of eating down in a few hours a good many hundred seedlings), but also by the injuries done to the larger trees from the number of branches lopped off by the herdsmen for their cattle,—only a few of the leaves of these branches being eaten, the rest are trampled down and wasted.

(2).—By protecting the forests entirely from fire, a most difficult matter, and only to be effected by strong measures.

(3).—By prohibiting any one from cutting a twig or even from entering the forest carrying an axe.

These measures, and specially the first, could probably be fully enforced only on Raneekhet hill, and on certain selected spots beyond it, such as Seonee. I would strongly recommend their immediate adoption in the Seonee forest.

12. *Nurseries.*—These are required for the extension of timber, fuel and fruit trees. But until it is known what population will have to be provided with fuel and building timber, it is of course impossible to go into exact details (especially in reference to fuel) as to the area that will require to be planted out. But the present uncertainty on this point need not interfere with the immediate preparations of nurseries, as it costs very little less to prepare these for plantations to cover a hundred acres than for double that number. And even, although the station of Raneekhet were not to extend beyond its present dimensions, plantations would be necessary to provide for the future. In the separate communication marginally noted, submitted in conjunction with Mr. Craw, I have recommended a site for an orchard and tree-nursery extending to 45 acres, and capable of extension, if necessary. In that communication we have entered into full particulars as to the advantages of the site proposed, and we have given our opinion as to what ground will be wanted for the proposed orchard: the subject need not be further referred to here. I would only express a hope that the site be sanctioned without loss of time. This is most desirable for two reasons:

No. 92, dated 25th May 1871, Kumaon Forest Office.

From Dr. G. King, Officiating Deputy Conservator of Forests, North-Western Provinces, and Mr. Craw, to Conservator. *Subject.*—Site for Orchard Nursery.

First.—A large number of grafted fruit trees of the finest English and French sorts, besides English stocks for grafting upon, was received from England about a year ago, and a second supply more recently. On their arrival these were put down temporarily in a nursery within the cantonment, which had been prepared for them by Captain Birney. These plants are now in a very thriving state, and it is absolutely necessary that they be, without further delay, planted out in the sites they are permanently to occupy. They were got out for the purpose of being propagated from, and they are now ready for a commencement being made. But they must first be planted out in a proper site. The cantonment garden near to which they are at present located, is quite unsuitable for propagation purposes. The soil is poor, the water-supply insufficient, and the situation bad. Were the nursery site adopted as recommended in the communication above referred to, these trees might be at once removed to it, and propagation commenced as soon as they have established themselves there.

Secondly.—The fuel question is so very urgent indeed that no time ought to be lost in making commencement of nurseries, and if the approaching rainy season be allowed to slip away without active steps being taken, another year will be lost. A considerable amount of experience has been gained from the operations that have been already carried on by Captain Birney and Mr. Craw in connection with the station garden within cantonment. This garden site originally extended to about 30 acres, and a tasteful design for laying it out was planned by Mr. Craw. About half of the ground however was taken up for other purposes, and the piece that remains for the garden possesses soil of extreme poverty, and but a poor water-supply. In a small plot of land below this garden, the fruit nurseries already alluded to have been made, as also nurseries of Deodar and other species, and of Australian gum and acacia trees.

Both nurseries are in made-up ground, the natural soil being too poor for the purpose. Any extension of nursery in such soil would be simple waste of money (even were there space, which there is not), as success could only be obtained by the expensive process of bringing good soil to the plants. A number of seedling Australian trees of various species was last year removed from these nurseries and planted out in groups of about forty in different parts of the hill. This was done as an experiment, and from it we have learnt that gum trees will thrive almost on any part of the hill. The growth of some of these gum trees in Captain Birney's private garden has been really astonishing. I would therefore most strongly urge the immediate adoption of the nursery site recommended, the ground of which is in a great measure ready prepared for the reception of seed.

13. *The kinds of seeds to be sown.*—Of *timber* trees I would recommend the following as the chief species to be sown in nurseries:

Indian.

Deodar.
Toon.
Kakar,—(a fine furniture wood).
Walnut.

English.

Larch.
Scotch Fir.
Ash.
Beech.
Elm.
Oak.
Sweet Spanish Chesnut.

Australian.

Red Iron Bark (Eucalyptus.)
Box (Eucalyptus rostrata.)
Yellow Box (Eucalyptus sp.)
Bastard Box (Eucalyptus sp.)
Red and white stringy Bark (Eucalyptus.)
Blue gum (Eucalyptus punctata.)
White Butt (Eucalyptus sp.)
Black Butt (Eucalyptus sp.)
Swamp Oak (Casuarina stricta.)
River Oak (Casuarina quadrivalina.)
Forest Oak (Casuarina Tuberosa.)

The Australian species above mentioned all yield valuable timber for building, engineering and other purposes. No timber can however be more suitable for building in the hills than Deodar, and, although the Australians grow faster, it should be planted out largely.

Of fuel trees—I would recommend the following for the nurseries:

Indian.

Oak (Quercus incana), Rhododendron (R. Arboreum), Utees (Alinis nepalensis). This last yields rather a light fuel; but the rapidity with which the tree grows, and the facility with which it can be struck from cuttings, recommend it.

Wild Cherry, Poplar and other indigenous hill trees should also be tried.

Australian.

Acacia Deolbata.
Acacia Melanocylon.

For fuel plantations trees are wanted that grow rapidly, coppice freely, and, if possible, that spread by root shoots, the last character being of great importance where, as is often the case, it is necessary to cut down the main stems before the trees have begun to yield seed. It is also requisite that the wood be hard and not too resinous. Most of these characters (as will be seen from the following extract from a letter of Major Beddome, Conservator of Forests, Madras) are eminently possessed by the two acacias just named.

Major Beddome writes—Our fuel plantations on the Nilgherries are composed almost entirely of the *Acacia Deolbata* and *Acacia Melanocylon*,—two Australian trees which grow very rapidly at elevations of between 4,000 and 8,000 feet; both trees grow most rapidly from coppice, particularly the *Deolbata*, and that species spreads wonderfully by suckers, and, when once established, can hardly be eradicated. Our plantations are as yet too young to afford any proper data as to the yield per acre.

Besides sowing in nurseries, I would strongly recommend the scattering broad-cast of seeds of Cheer, Utees and other indigenous trees in suitable plots of land in the forest; such plots ought to be ploughed up early in the rains, and the seed put in immediately. In suitable localities, no artificial watering whatever would be required, and in fact little more than protection from cattle.

Thinning would be wanted where the seeds had germinated too near each other, but the seedlings thinned out might be planted elsewhere. As so little has been done towards the introduction into India of the more valuable forest trees of other countries, I think the proposed nurseries at Raneekhet ought to be utilized for experiments in acclimatization. The list of exotic trees above given is not intended as more than indicative of the chief sorts that might be sown to begin with.

14. *Plantations.*—The nature of these has already been indicated. The area available for the purpose on the Raneekhet hill itself is large; and on the neighbouring hills within the twelve miles radius of the station, and specially in the direction of Seonee, it is practically unlimited. On Raneekhet itself there are notably the wide spaces cleared of timber by Mr. Troup for his tea cultivation. These stand ready prepared to receive young trees, and on every account they ought to be the spots first planted out. The site recommended for a nursery by Mr. Craw and myself stands in the middle of them, and there is nothing to hinder their being covered with young plantations in a year or two, if operations be at once begun. Besides these, there are numerous other spots on the hill where both fuel and timber trees might be planted out; but as I do not know what parts are to be devoted to building sites, I cannot further indicate particular places for plantations.

15. *Establishment.*—Before anything definite or permanent can be proposed under this head, two points must be settled: (1.) How many people fuel and building timber will have to be provided for; (2.) The annual yield per acre that can be expected from a fuel plantation in the hills, and experience alone can settle this. Dr. Brandis estimates the yield, I believe, for the irrigated plantation of Changa-manga in the plains of the Punjab at 50 maunds per acre per annum on the whole plantation; but the average yield of all the Punjab plantations is put down at only 25 maunds. In the meantime, a scheme is absolutely necessary, and, though professedly tentative, it need not be inefficient. I would therefore suggest the entertainment—

First, of a European officer *practically acquainted with gardening*, whose duty it would be to take *practical supervision* of the nurseries, orchard, and plantations, and also to act as Forest Officer for the forest on the hills within twelve miles of the station, and who should be invested with magisterial powers for the punishment of infractions of all forest rules. For the first duty, it is absolutely necessary to have a man practically acquainted with the details of gardening and plantation work, as propagation of fruit trees will form a great part of his labors. The nurseries that exist at present are under the care of Mr. Craw, than whom no better officer could be desired. I do not know, however, how far his duties in his tea plantation will admit of his living at Raneekhet and exercising an active supervision over the forests within the twelve miles radius.

Second, a nursery establishment—

	Rs.
A mallee (chowdry) on	20 a month.
10 good mallees on Rs. 8 to 12, say ...	100 „
Coolies as required, say	60 „
Contingencies	20 „
Total	200 „

Third, for the conservancy of forests round Raneekhet—

	Rs.
1 Ranger	10 a month.
8 Patrols, at Rs. 6 each	48 „
Total	58 „

Fourth, for the extra cantonment forests on Raneekhet (if transferred to the Forest Department), 6 patrols at Rs. 6,—Rs. 36 a month. I beg most distinctly to state that the above is not submitted for sanction as a permanent establishment, but merely as an indication of what would probably be required. At first fewer and ultimately more men would be needed for the nurseries. The actual necessities can only be learnt through time and experience. At present there is an establishment (paid for by the Kumaon forest division) of one ranger and five patrols costing Rs. 40 per mensem, and a monthly expenditure on the nurseries of about 30, while Rs. 150 are paid monthly to Mr. Craw.

16. *Revenue.*—At present the forest department collects no revenue from Raneekhet. The Public Works Department through the Executive Engineer cuts on its own responsibility whatever timber is required for public buildings, and all timber cut within cantonments for other purposes is sold for the benefit of the cantonment fund, which has little other source of revenue. While these arrangements remain in force, the only sources of revenue open to the Forest Department will be—(1) royalty on trees cut outside the cantonment for *private building*—the amount of this royalty will have to be settled; (2), royalty on firewood collected outside the cantonment.

From the plantations and orchard no revenue can be derived for some time. The Raneekhet forest accounts must therefore continue to be for some years mainly records of expenditure.

From G. KING, ESQ., M. B., Officiating Deputy Conservator of Forests, Kumaon, and W. CRAW, ESQ., Sub-Assistant Conservator of Forests, in charge of Plantations, Raneekhet, to the Officiating Conservator of Forests, North-Western Provinces,—dated Nynee Tal, the 25th May 1871.

WE have the honor to report that, in accordance with your instructions, we have carefully gone over the whole of the ground covered with the Trigonometrical Survey's large map of Raneekhet and its environs, with the view of selecting the best site for an orchard and for nurseries for fruit, timber and fuel trees. The area which we have inspected includes (1) the present cantonment; (2) its proposed extension; (3) all the land purchased from Mr. Troup, not included in the above; and (4) a considerable extent of forest to the east of Mr. Troup's boundary and in the direction of the villages of Ussat and Roonee.

2. The object of Government in regard to this matter we understand to be—

1*st*, the formation of an orchard of English and other fruit trees, in which may be propagated supplies of young plants for distribution to Raneekhet and other stations in Upper India;

2nd, the establishment of nurseries of trees yielding wood suitable for fuel and for building (but especially the former), from which young stock may be supplied for transplantation to permanent situations in the forest and waste lands near the station, so that a continued and plentiful supply of timber may be secured for the cantonment. We also understand that in the choice of a site suitable for the acclimatization of new and useful plants, and adaptability to the purposes of a pleasure ground are to be kept in view as minor considerations.

3. In endeavouring to carry out these objects, the requirements that we have kept steadily before us have been (1) suitability of soil and exposure; (2) a plentiful supply of water; (3) convenience of access and nearness to the station and to the localities where plantation is likely to be carried out. The site which in our opinion is most suitable for the purposes indicated, is that marked on the accompanying map. It extends to about 45 acres, and occupies some slopes and shallow ravines facing north-east in the second or middle of the three tea plantations that were bought from Mr. Troup. It lies on the side of the hill beneath the unfinished house which Mr. C. Troup had intended for his own residence, but is a good way down the side of the hill, so that it does not in any way encroach upon building sites on the ridge. It lies also considerably lower than the house at Oaklands, and is separated from the tea plantations under Oaklands by a low spur of hill running north-east.

4. The soil consists of a rich loam formed chiefly of decayed vegetable matter, and of great depth. It is in fact extremely good, and we met with no equally large piece of ground of such uniform excellence in this respect. As it consists of slopes, all tendency to the retention of excessive moisture is counteracted, while, on the other hand, the slopes are not so extreme as to produce undesirable dryness.

5. The water-supply is extremely good; each of the ravines included in the site contains a spring.

6. Having been laid out as a tea garden by Mr. Troup, the land is already clear of forest and of weeds. It has been besides levelled to a great extent. Much preliminary expense, besides time, would, therefore, be saved were this site decided upon, and the operations of planting and sowing might, in fact, be at once begun. The saving of time is a highly important consideration. Last year a large number of grafted English fruit trees of all sorts, besides a quantity of English stock for grafting upon, were got out from England. These were put into a small nursery within cantonment garden. These plants still remain there, and it is imperative that during the coming rains they be planted out in the sites they are permanently to occupy. If this is not done during the present year, the plants will have become too large to be removed with safety, besides time for propagation will be lost. It is not of the slightest use to think of planting them out permanently *in the present station garden*, as the soil is by far too poor, the water-supply too scanty, and the situation too much exposed to visitors.

7. If the site now proposed be sanctioned, not only can these fruit trees be transplanted during the ensuing rains, and propagation be begun, but the large collection of seeds of Australian fuel and other trees now in hand can be sown at once, and thus a whole season be saved. The necessity of arrangements for fuel plantations being at once made and energetically carried out, is most apparent to us both, as it is quite clear that the sources from which supplies of fuel are presently derived are very limited indeed, and that if they are not speedily relieved of the drain upon them, it is only a question of time when Raneekhet shall be as bare and dry as the neighbouring station of Almorah. The proposed site lies, moreover, in the very middle of one of the parts of the hill, and close to a second, which having been cleared entirely of natural timber ought to be the first spots to be planted, and which having been used as tea gardens stand ready prepared for the reception of young trees.

8. In case exception may be taken to the somewhat irregular shape of the proposed site, we beg to explain that we have carefully excluded all indifferent and unsuitable ground, and endeavoured to secure a good water-supply.

9. With regard to the latter matter in particular, we beg to explain that the narrow piece of ground which projects above the upper pathway, marked in the map, has been taken in, because we consider it of the greatest importance to secure the whole of the ravine, so that the stream of water which issues in it below the pathway may not be interfered with by injurious cutting and clearing of trees and bushes in its upper part above the pathway

10. Although the site we have indicated contains, in our opinion, no useless or bad pieces of ground, we respectfully beg to state that we recommend it in its entirety, and not as a plot of which only a portion may be selected. If, however, the whole be considered too large, the only curtailment of its extent which we consider compatible with its retention for the purpose for which we have chosen it, would be to cut off the piece lying to the north and west of the dotted line indicated in the map. But even this we consider undesirable, and an area of 45 acres is, after all, by no means a large one for a plantation scheme of any value.

From R. P. COLVIN, ESQ., Deputy Conservator of Forests, North-Western Provinces, to the Officiating Secretary to the Government, North-Western Provinces,—No. 115, dated Nynee Tal, the 4th July 1871.

IN forwarding the accompanying report of a site for orchard and fuel propagation plantations at Raneekhet, I would point out that both Dr. King and Mr. Craw have very carefully examined all the country near the station; and although I have not had an opportunity of inspecting the proposed site, I can most confidently endorse their views on the subject, for I feel sure that for this work more competent officers could not have been selected.

2. It will be seen by the report that if anything is to be done this year, the ground should be made over to the Forest Department at once; for, if the rainy season is lost, nothing much can be done until the rains of 1872.

3. If the fruit and fuel propagations are to be carried on on a large scale, 45 acres is not a bit too much; but should His Honor think the plot too large, I would suggest that the curtailment be effected according to the suggestion contained in the report, for Dr. King and Mr. Craw have evidently weighed the matter very carefully.

4. In case there is likely to be delay in *officially* making over this ground to the Forest Department, I would propose that partial sanction be given, so that Mr. Craw may plant out the English fruit stock, sow the Australian and other seeds, and go on with the propagation, otherwise the rains will have passed away and a whole year have been lost.

5. A map (the return of which is solicited in due course) of Raneekhet is enclosed, showing the proposed site, &c.

6. This letter complies with G. O. No. 33F—C., dated 7th February last.

From MAJOR J. BONUS, R. E., Assistant Secretary to the Government, North-Western Provinces, Public Works Department, Railway Branch, to the Secretary to the Government of India, Public Works Department,—No. 143 F—C, dated Nynee Tal, the 12th August 1871.

IN continuation of this Office No. 103 F—C of the 24th July, I am directed to forward, for the information of the Governor General in Council, copy of a memorandum No. 140 F—C, dated 12th instant, issued to the Conservator of Forests, regarding the conservancy of the Raneekhet forests.

2. The Government of India will observe that in respect of the forests within cantonments limits, the Forest Officer will be merely the adviser of the Cantonment Magistrate and Executive Engineer.

Memorandum from MAJOR J. BONUS, R. E., Assistant Secretary to the Government, North-Western Provinces, Public Works Department, Railway Branch, to the Conservator of Forests, North-Western Provinces,—No. 140 F—C, dated Nynee Tal, the 12th August 1871.

WITH reference to the Notification of the 24th July, placing the forests of Raneekhet within a radius of 12 miles round Kampoor Hill under the forest laws, copy of which Notification was sent to Conservator with No. 111 F—C of same date, requests that the Conservator will at once send the Kumaon Forest Officer to Raneekhet to be stationed there, in accordance with the arrangement which was lately discussed between Conservator and Assistant Secretary, and which has received the approval of His Honor the Lieutenant-Governor.

2. Lieutenant Campbell who, it is understood, is the officer in question, should mark out the 12-mile limit at once, and the conservation of the forests within that limit should be strictly enforced so far as the forest lands are concerned, and a map will be prepared in communication with the Commissioner of Kumaon showing the village lands, Troup's estate, and cantonments within the main boundary, and which will be hereafter exempted from the forest laws.

3. The Forest Officer will be responsible for *advising* in all matters within cantonments, but not for the executive charge which will rest in the hands of the Executive Engineer. The latter will act in respect of the forests in cantonments (and also in respect of the Troup estate) in concert with the Cantonment Magistrate and Forest Officer.

From A. O. HUME, ESQ., C. B., Secretary to the Government of India, Department of Agriculture, Revenue and Commerce, to the Secretary to the Government of the North-Western Provinces, Public Works Department,—No. 202, dated Simla, the 31st August 1871.

I AM directed to acknowledge the receipt of your letter No. 103 F—C, dated 24th ultimo, forwarding copy of a report by Dr. G. King, and other papers on the forest conservancy and the plantations at Raneekhet, and in reply to state that the Governor General in Council has read Dr. King's very interesting report with great satisfaction, and cordially endorses the praise bestowed upon it by His Honor the Lieutenant-Governor. The recommendations contained in it are excellent, and His Excellency in Council trusts they will be borne in mind and carefully carried out.

2. His Excellency in Council concurs generally in the action taken by His Honor the Lieutenant-Governor on this report; and, with reference to paragraphs 3 and 4 of your letter, desires me to convey his sanction to the establishment of a system of regular forest conservancy over a range having a radius of 12 miles from the Kampoor Hill, as also over the Seonee Forests. His Excellency in Council also approves of the forests in the neighbourhood of Raneekhet being placed under the supervision and control of a local European forest officer for conservancy purposes, and that no trees should be cut either for building or other purposes whether by the people, or for the public service, but as indicated by him. I am directed to request that it may be ascertained whether Mr. Craw, who is at present only temporarily entertained, would be willing to accept the appointment permanently, and on what terms. His Excellency the Governor General in Council considers that Mr. Craw's services may be also most usefully employed at Raneekhet for experimenting upon all trees, plants, and agricultural produce suitable to the climate of the Himalayas.

3. The Governor General in Council cordially approves of the establishment of the plantations (referred to in paragraph 6) for providing a local supply of fuel, as well as of the nurseries referred to in paragraphs 10 to 12, for the experimental cultivation of fruit trees and other vegetable products, both useful and ornamental, suitable to the climate and locality.

4. I am also directed to state that His Excellency in Council will be glad to receive speedy information as to the progress of the work sanctioned at Raneekhet, in conformity with Dr. King's report, and would wish to know, before the end of the rainy season, what is really being done in the way of forming gardens for the propagation of trees and plants.

5. With reference to the subordinate establishment referred to in paragraph 14 of your letter, I am directed to request the submission of a tabular statement in the usual form, in which should be included only such individuals as will be permanently entertained. Ordinary laborers should be regarded as purely temporary, and their pay should be charged to the cost of the plantations.

6. Your letter under reply, with its enclosures and this letter, will be published in the Supplement to the *Gazette of India*.

From A. O. HUME, ESQ., C. B., Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce, to the Secretary to the Government, North-Western Provinces, Public Works Department,—No. 200, dated Simla, the 31st August 1871.

I AM directed to acknowledge the receipt of your letter No. 143 F—C, dated 12th instant, forwarding a memorandum of instructions to the Conservator of Forests, regarding the conservancy of the Raneekhet forests, and to state that it is the wish of the Governor General in Council that the regulations and restrictions therein prescribed should also be made applicable to the hill called Sir Devi, which lies between Raneekhet and Almorah, and which is approached by the Runi Spur.

Tobacco Cultivation in Southern India.

From J. BROUGHTON, ESQ., Government Quinologist, to the Acting Sub-Secretary to the Board of Revenue,—dated Ootacamund, the 25th May 1871.

REFERRING to Government order No. 1606 of 21st October 1870, in Revenue Department, I have the honour to give a report on the large number of specimens of tobacco I have received, and on the general question of tobacco-cultivation in South India.

2. The specimens received have been very numerous, and comprise apparently all the good indigenous tobaccos grown in this Presidency. As the best mode of analysis of these has been a subject of much consideration with me, I will first append a tabular statement of the results I have obtained after much thought of the various points on which information was necessary. It will be perceived that the list comprises nearly every possible variation in the amounts of the constituents determined by the analysis. To these results I append the numbers yielded by the Shiraz tobacco grown in Tanjore, received from Revenue Board, and those obtained with some cigars given me by Dr. Ross here, and which are referred to in Board's Proceedings No. 6619 of 12th November 1870.

No.	Tobacco-specimen from	Per cent. of ash.	Per cent. of carbonate of potash in ash.	Per cent. of nicotine.
1	Vizagapatam, Vizagapatam, No. 1, 1st sort ...	22·653	12·5 ·	1·41
2	Do. do. „ 1, 2nd sort ...	20·185	17·83	1·45
3	Do. do.	26·339	3·29	2·45
4	Do. Chiparapilly, No. 2	17·544	9·6	2·37
5	Do. Ankapilly, „ 3	18·592	8·01	5·40
6	Do. Srungavarapukota, No. 4 ...	20·740	9·91	5·49
7	Do. Vizianagram, No. 5	20·411	7·2	4·54
8	Trichinopoly, Trichinopoly A	22·829	6·05	2·52
9	Do. do. B	21·485	8·16	2·41
10	Do. do.	24·434	5·29	1·83
11	Do. (Cigars) Talamputty Pulvor ...	20·396	8·25	3·28
12	Do. do. Natapur	26·848	4·42	4·55
13	Do. do. Valicundapuram ...	23·108	3·91	4·15
14	Bellary, Hospet	19·933	3·46	3·74
15	Do. Raidroog	18·931	13·29	1·70
16	Do. Harpanhully	20·29	3·75	4·99
17	Do. Sundoor	20·114	4·40	2·41
18	Nellore, 1st sort	19·422	8·12	2·16
19	Do. 2nd sort	18·606	5·81	1·83
20	Cuddapah, Pullampet A.	20·701	4·62	2·03
21	Do. do. B.	20·507	3·45	1·33
22	Do. Sidhout C.	23·951	4·07	2·99
23	Do. Budwail E.	22·453	3·71	2·70
24	Do. Chinnia Dandloor G.	16·255	4·14	5·1
25	Do. Prodatoor H., No. 1	21·698	4·49	2·75
26	Do. do. I., „ 2	16·432	6·15	4·82
27	Do. Jammalmadagu J.	22·105	3·52	5·07
28	Do. do. Ponnatolah K., 1 ...	17·327	5·93	5·36
29	Do. Madanapully P.	18·743	5·95	7·44
30	Do. do. Q. 1	20·18	2·28	7·23
31	Do. from Board of Revenue	24·75	4·36	1·70
32	Tanjore, Tanjore	20·745	8·71	2·49
33	North Arcot	22·895	10·06	4·40
34	South Arcot, Ravathavallur	21·115	11·92	3·99
35	Nilgiris, Todanad	20·596	29·26	1·43
36	Do. Koondahs	17·786	6·37	2·95
37	Kurnool, Nundial (masub soil)	4·030	4·31	1·41
38	Do. do. (ragud soil)	22·535	0·78	2·49
39	Do. do. (local soil)	16·85	9·89	1·33
40	Do. Markapur	22·767	3·89	2·45

No.	Tobacco-specimen from	Per cent. of ash.	Per cent. of carborate of potash in ash.	Per cent. of nicotine.
41	Kurnool, Cumbum	19·22	9·77	1·87
42	Coimbatore, Coimbatore	22·856	2·94	3·32
43	Do. do.	22·606	5·64	4·95
44	Do. do.	19·923	7·92	4·90
45	Do. Pullachy	24·987	4·39	1·95
46	Do. Moocasipoodoor	25·73	7·67	2·24
47	Do. Coorchy	26·39	7·93	1·17
48	Do. Poondoray Seemoor	23·34	2·65	1·29
49	Do. Aval	23·49	19·97	1·46
50	Do. Monigumpollium	26·65	2·61	2·95
51	Shiraz tobacco from Tanjore	22·86	2·99	1·91
52	Cheroots supplied by Dr. Ross	28·50	0·39	2·04
53	Do. made from Shiraz tobacco grown at Tanjore	25·68	5·98	1·67

3. With respect to the above analysis and to the determination of the above particular constituents, some remarks are required. According to our present knowledge, the quality of tobacco, unlike substances where excellence depends on the preponderance of a special or a few special constituents, cannot always be inferred from an analysis, however complete it may be. It would be absurd to conclude respecting the quality of wine, for instance, from an analysis stating the percentage of spirit, sugar, tannin, etc., such as could be easily made. These numbers would give no information whatever as to flavour, age, and other qualities, upon which the goodness depends, and would throw no light whatever on the still slighter variations of quality which appeal more particularly to the tastes of individuals: as with wine, so with tobacco. Chemistry, according to our present knowledge, cannot indicate the constituents or the proportional amounts which shall cause the results of burning it in an incomplete manner to possess the greatest excellence of flavour; it can only lay down the broad proportions in which certain constituents must occur to produce this excellence. But these proportions may actually occur in a tobacco, and yet the greatest excellence of flavour may possibly not follow.

4. What is usually called the strength of tobacco in smoking depends immediately on the amount of contained nicotine. A tobacco that contains over four per cent. of this powerful alkaloid is a strong intoxicating tobacco, while that which contains less than three per cent. is called mild. It has been found, as an invariable result of experiment, that the finest tobaccos as the Havana, Manila, Cuban, and others, do not contain more than 2 to 3 per cent. of nicotine. To this result there is no exception that I am aware of, though of course by the constant custom of smoking strong tobaccos, a few persons may even become so as to prefer it to the finer kinds. These exceptional tastes do not interfere with the otherwise universal currency of the rule. It is remarkable that among the numerous Indian tobaccos, I have but found two instances in which as much nicotine as is found in Virginian or French tobaccos, where it amounts to nearly 7 per cent.

5. Another important constituent of tobacco of high quality is the organic salts of potash. As these, in the burning of tobacco, become converted into the carbonates which are found in the ash, I have therefore in each case made a determination of the amount of carbonates of potash in the ash of the specimens. The whiteness and permanency of the ash of a sigar depend entirely on the amount of potassic carbonate it contains. The presence of potash salts certainly modifies the burning of tobacco in a peculiar way to the improvement of its flavour, and also positively facilitates its burning. It will be familiar to the experience of every smoker in this country how far more difficult it is to retain alight a country cheroot, with its grey scattering ash, to the white coherent ended Manila or Lunka. These remarks appear trifling; but it is on these trivial matters that the quality and value of tobacco for smoking depends. Organic salts of soda are practically absent from tobacco.

6. Nitrates are found in occasionally very considerable amounts in all tobaccos, and especially in those of this country. Though they effect the combustibility of the tobacco very considerably, they have a far less influence in this respect than the organic salts of potash. It has been shown by M. Schlöring, Director of the late Imperial Tobacco Works in Paris, that the presence of nitrates in quantity has no connection with the quality of the tobacco, I have therefore not made any estimation of the amounts of nitre present in the specimens received.

7. An examination of the table of analysis on the principles enunciated above shows that Nos. 1, 2, 4, 7, 8, 9, 11, 15, 18, 32, 39, 41, and 46 possess in the main the qualifications necessary to tobacco of good quality. It is to be remarked also that the tobacco of Vizagapatam and Trichinopoly are, as a whole, of better quality than those of other parts of South India—a fact also of experience. Bellary, Nellore, Tanjore, Coimbatore, and Kurnool also contribute single specimens of tobacco of good quality, though Nos. 15, 39, and 41 possess on actual smoking, a far too strong and pyroligneous flavour, to be agreeable to a smoker unaccustomed to the tobaccos. Tobaccos Nos. 35 and 36 furnish important examples of how it is possible by special culture to modify the constituents of a tobacco-ash. It is well known that the soil of the Nilgiris is exceedingly poor in salts of lime to a very exceptional degree, while from the decomposing felspar, it is comparatively rich in potassic salts. The analyses show that the tobacco grown on these hills yields an ash in which the ordinarily occurring calcic carbonate is nearly entirely replaced by potassic carbonate, so that in one specimen the latter substance occurs in the ash to the large amount of 29·26 per cent. Though the cultivation of tobacco on these hills is of the roughest possible kind and produces consequently a most inferior product, I cannot but consider the result now mentioned as most important and suggestive.

8. I have received with the specimens of tobocco, in many cases carefully collected, specimens of the soils on which they were grown. I have examined these, and find in all cases considerable amounts of calcic carbonate. The presence of this subtance in abundance, in connection with a comparative absence of potassic salts, must inevitably cause the ash of the tobaccos to abound in calcic carbonate, and thus depreciate its quality. I am quite of opinion that it is this cause which produces the general inferiority of Indian tobaccos. An examination of the first fifty of the analyses given shows that thirty-nine kinds contain less than nine per cent. of potassic carbonate in their ash.

9. But with ordinary European smokers, for whom the English and Continental tobacco markets exist, and who are accustomed to the use of the fine foreign tobaccos, I do not think that Indian tobaccos of even good quality would be found agreeable. It is stated in a memorandum of Dr. Hooker's, published in the *Nilgiri Gazette* of April 19th, 1870, that he was informed by the brokers "that the Indian and Colonial tobacco is very poor indeed." A slight apprenticeship is always necessary before Anglo-Indians relish even the finest Indian cheroots, though custom subsequently brings a full appreciation of their good qualities. For export it, therefore, appears necessary that not only should the tobacco be of good quality, but that it should also be of the very kind to which the market is accustomed. In other words, the kind of tobacco exported should not be of the Indian but of foreign varieties. If Indian tobacco be exported, it should be most carefully selected; and against this the fact remains, that there is in this country a most ready sale for the better kinds, and consequently with them there is but little profit in export.

10. In Proceedings of Board of 12th November 1870, No. 6619, enclosure No. 2, Dr. Ross describes the growth of some Ohio and Shiraz tobacco. He has been good enough to give me a few cheroots made of the tobacco. Though they contain the amount of nicotine found in the best specimens of tabacco, they are abominable in flavour. Their ash is black, and contains but 0·39 per cent. of potassic carbonate. This is the cause of the bad quality and black ash. The tobacco was grown on soil rich in lime salts, and was not manured with manures rich in potash. It is quite certain that the finest foreign tobaccos will not yield a good produce in most parts of South India unless carefully and systematically cultivated.

11. The tobacco from Shiraz seed, which I received from Tanjore, is of better quality, but it is undoubtedly affected by the small amount of potash salts in the soil in which it was grown. Had the soil been manured with the ashes of plants, this tobacco would doubtless have been of fine quality. As it is, the ash is not good, and the flavour, though not bad, is not equal to that of real Shiraz.

12. The cheroots made from the Shiraz tobacco are much better. Whether grown on different soil, or from some local cause, they are an improvement on the latter specimen. Their ash contains 5·98 per cent. of potassic carbonate, and the tobacco somewhat less nicotine. The cheroots are good, of pleasant flavour, but are too new to have reached their best flavour.

13. In consequence of the directions issued by the Board, I have received full accounts of the method of cultivation and curing of tobacco. The former does not appear to differ much in various parts of South India. From Nellore, North Arcot, Coimbatore, Trichinopoly, it is very significant to learn that tobacco is improved in quality by being watered by water from brackish wells. But the method of curing differs greatly both in the manner in which the tobacco is fermented, and the duration of time during which it is exposed to fermentation. Though these variations doubtless have considerable influence on the flavour of the tobacco, I have had no experience on their effects, and can only state my conviction that the method of curing which produces the best tobacco will be found the best to employ, as it is the most simple. The sprinkling with water containing jaggery and the bark of *Acacia Arabica* can hardly fail in being both useless and injurious. One or two specimens of tobacco

which I have received were spoilt for smoking to an English palate by the amount of jaggery they contained.

14. In order to cure the very general defect of Indian-grown tobacco, I would strongly advise that the plots of ground on which the foreign tobaccos are grown should, in addition to cattle manure, be also manured with the ashes of wood or plants. If these could be prepared by burning on the ground, it would be better. I find it is customary in Manila to do so, and it was a result of M. Schlöring's experiments in France that this treatment increased the amount of potash salts in the tobacco. I have no doubt whatever that by this treatment tobacco of the finest quality could be grown in India.

15. From what I know of the soil of Wynaad, I have a strong conviction that it would be well suited to tobacco cultivation. Like the soil of the Nilgiris, it contains but little calcium salts, and much potash. Wynaad possesses also a climate which appears very favourable to the plant.

16. The large amount of ash yielded by tobacco fully explains why it is an exhausting crop. The elaborate arrangements customary in Trichinopoly for its manuring doubtless are a cause of the high local reputation of the tobacco there produced. Poor soil and lax cultivation will never produce good tobacco. In all places where the tobacco has a requtation it appears that much care is taken both to manure it highly and to cure it with great attention, after it is harvested. Unless this be done, it will be useless to expect favourable results in India, or anywhere else.

17. I shall be glad to receive tobacco grown from foreign seed for analysis, as soon as that grown near the Horticultural Society's Gardens, Madras, and on the Government Experimental Farm, is ready. I should much like to compare the results of tobacco manured with that grown without manure, and also some grown with a plentiful manure of plant ashes with that grown on a small plot unmanured.

THE acknowledgments of the Board are due to Mr. Broughton for his masterly and interesting report above recorded, which will be communicated to Government with a suggestion that the report be as extensively published as possible.

2. The attention of the Superintendent of the Government Farm is drawn to Mr. Broughton's remarks in the last paragraph of his letter.

3. The result of the experimental culture of tobacco at the Government Farm, desired by Government in their Proceedings, Revenue Department, 21st October 1870, No. 1606, will be communicated as soon as known.

Submission of Reports by Local Governments and Administrations on the state of the weather and prospects of the crops.

Extract from the Proceedings of the Government of India in the Department of Agriculture, Revenue, and Commerce,—Nos. 78-93, dated Simla, the 6th September 1871.

READ again the following papers:

Circular to Local Governments and Administrations, Nos. 26-35, dated 31st July 1871.

Ditto, Nos. 55-66, dated 23rd August 1871.

Letter to Cotton Commissioner, Central Provinces and Berar, No. 68, dated 23rd August 1871.

Telegram to Chief Commissioner, British Burmah, No. 70, dated 25th August 1871.

Read also the reports on the weather and the prospects of the season in several Provinces, published in the Supplement to the *Gazette of India* of 2nd September 1871.

OBSERVATIONS.—His Excellency the Governor General in Council regrets to notice that no returns of the state of the weather and the prospects of the crops have been received from either Madras or British Burmah.

2. The returns from Sindh, Oudh, and the North-Western Provinces are somewhat meagre.

3. The report from Bengal, though full as regards floods, is wanting in details as to the state of the crops and the prospects of the season.

4. The return from the Central Provinces shows exactly the nature of the particulars required for each Division or important provincial Sub-Division.

5. In addition to these divisional or sub-divisional reports, the opinion of the Local Government or Administration, as to the prospects of the crops in the Province or Presidency generally, should be recorded.

6. The Cotton Commissioner has apparently neglected to forward the special telegraphic report on the prospects of the cotton crop generally, which was required.

7. The next telegraphic report should be despatched by Local Governments and Administrations on Thursday, the 14th September, so that it may reach the Government of India by the 15th without fail, and appear in the *Gazette* of the 16th.

8. His Excellency in Council attaches great importance to these returns, and trusts that on future occasions, they may be submitted by all Local Governments and Administrations with the utmost punctuality, and in all necessary detail.

Government of Madras.	Resident at Hyderabad.
" Bombay.	Commissioner, East Berar.
" Bengal.	" West "
" North-Western Provinces.	" Sindh.
" Punjab.	Cotton Commissioner, Central Provinces and Berar.
Chief Commissioner of Oudh.	Agent, Governor General, Central India.
" " Burmah.	Ditto ditto, Rajpootana.
" " Central Provinces.	
" " Mysore and Coorg.	

ORDER.—Ordered, that a copy of this Resolution be forwarded to the Local Governments, Administrations, and Authorities noted in the margin.

Death of Captain J. P. Basevi, R. E., Deputy Superintendent, Great Trigonometrical Survey of India, whilst carrying on the pendulum observations in connection with the other geodetical operations of the Survey Department.

From MAJOR T. G. MONTGOMERIE, R. E., Officiating Superintendent, Great Trigonometrical Survey of India, to the Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce,—No. 114—1036, dated Mussoorie, the 17th August 1871.

IT is with the deepest regret that I have to report the death of Captain J. P. Basevi, R. E., Deputy Superintendent, 1st Grade, Great Trigonometrical Survey, on the 17th July 1871, whilst carrying on the pendulum observations in connection with the other geodetical operations of this Department.

In order to carry out the programme proposed by Colonel Walker in communication with and under the auspices of the Royal Society, Captain Basevi had to take observations at two or more stations on the very elevated table-land of Tibet and Ladak. With this object he marched from the Punjab to Kashmir and thence to Ladak, where he completed the necessary observations at one station 15,500 feet above the sea. He then marched to the exteme confines of Ladak and crossed into the margin of Great Tibet, and had actually reached a fitting place for taking the last observations required, when he was unfortunately seized with the fatal illness from which he died at the early age of 39.

This lamentable occurrence took place two marches to the east of Kiyam, in the Changchenmo Valley, at an elevation of about 17,000 feet above the sea. Captain Basevi was then some forty marches from Murree, the nearest British station, and 32 marches from Kashmir, which was the nearest point from which he could have received medical aid.

His death was undoubtedly due to his devotion to his work, and, occurring as it did under such peculiar circumstances, I hope that an application which I intend to submit as to some extra pension for the widow, will meet with favorable consideration from the Government of India.

Captain Basevi was an officer of rare scientific and general attainments, and had devoted himself thoroughly to the work of this Department.

He had done good service in every part of India, from Ladak to the southernmost point of the Madras Presidency, one of his special charges having been the measurement of the Cape Comorin base-line; in all, his merits were conspicuous, but the crowning work of his life was the taking of the pendulum observations for the whole continent of India. To this most difficult task he devoted a large amount of talent and labor, of which it is hardly possible to convey an adequate idea. Commencing at the end of 1865 he pushed on the work with such energy that, at the time of his death, he had finished all the observing actually required over twenty-six degrees of latitude, with the exception of those at Karachi and Aden, which would have given but little trouble.

His labors will supply exceedingly valuable data towards solving the most interesting and difficult scientific questions as to the ellipticity of the earth and certain variations in the density of its crust.

Though Captain Basevi was anxious to observe at one other elevated station in Tibet, his work, even as regards that portion, may be considered complete; but it is much to be regretted that he was not spared to reduce his observations—a task for which he was eminently qualified with his accumulated experience of the last seven years. The Government of India has deservedly won a high reputation for its contributions to the cause of science, which have been such as to place it in the foremost rank with the most enlightened Governments of Europe. It is gratifying to think that these last labors of Captain Basevi are likely, when reduced and published, to assist in maintaining that high reputation and possibly to enhance it.

All proper arrangements will be made to complete what little remains to be done in the way of observing, with a view to finally reduce and publish the results. These will remain a noble and lasting monument of Captain Basevi's work, sufficient, I think, to establish a European reputation, which it is greatly to be regretted he did not live to enjoy.

I have no hesitation in stating that the Government of India has sustained a very great loss by the death of such a talented and devoted officer as Captain Basevi while in the prime of life. His matured experience would have been most valuable, not only in the Great Trigonometrical Survey, but in any other Department of Government to which it might have been applied.

From A. O. HUME, ESQ., C. B., Secretary to the Government of India, Department of Agriculture, Revenue and Commerce, to the Officiating Superintendent, Great Trigonometrical Survey of India,—No. 175, dated Simla, the 1st September 1871.

I AM directed to acknowledge the receipt of your letter of the 17th ultimo, No. 114—1036, reporting the death of Captain J. P. Basevi, R. E., Deputy Superintendent of the 1st Grade in the Great Trigonometrical Survey of India.

2. The Governor General in Council desires me to express the very great regret with which he has heard of this melancholy event. His Excellency in Council entirely agrees in your high appreciation of Captain Basevi's merits. The State has lost in him a most able and talented officer, whose patient and self-denying labors entitled him to the gratitude alike of the Government he served and of the world of science to whose interests he devoted himself. His sudden death in the prime of life, at a moment when he had nearly completed the important series of observations he had been engaged on, and when he was about to proceed to England to bring them to a close, and thus, it might have been hoped, reap the well-merited reward of years of ceaseless toil, is most deeply to be regretted; and the Government of India are most anxious that every endeavour should be made to complete Captan Basevi's all but finished work, and to publish it in such a form as may render it a fitting memorial of his services and their appreciation of them.

Telegraphic Report from the Commissioner of West Berar, dated 5th September 1871, on the state of the weather and prospects of the harvest.

WE have had a good fall of rain, three inches, in Mulkapur Taluk since the 30th, and it is believed to have been very general throughout the Division. Great hopes now of the crops, but wells are still exceedingly low.

Appointment of W. W. Hunter, Esquire, LL. D., as Director General of Statistics to the Government of India.

Extract from the Proceedings of the Government of India in the Department of Agriculture, Revenue, and Commerce,—Nos. 102-18, *dated Simla, the 8th September* 1871.

READ—

A Plan for an *Imperial Gazetteer of India*, dated 29th November 1869, from W. W Hunter, Esq., to the Secretary to the Government of India, Home Department.

A Note on the progress of the statistical operations in connection with the *Imperial Gazetteer* in 1870 and 1871, by W. W. Hunter, Esq., dated 1st June 1871.

Office Memorandum to Financial Department, No. 64, dated 2nd August 1871.

" " from " " " 3189, dated 30th August 1871.

RESOLUTION.—The Governor General has had under his careful consideration the question of the preparation of Provincial Gazetteers, and their eventual consolidation into an Imperial Statistical Account of India.

2. Three distinct series of operations have in time past been undertaken or encouraged by the Government, with a view to obtaining trustworthy accounts of the country, such as might form a Gazetteer of India; the whole representing a very large outlay, commencing as far back as 1769, and one of the efforts* costing £30,000 for merely collecting the materials for part of a single Province.

* That of Dr. Buchanan under the instructions of the Governor General in Council in 1807.

3. From a variety of causes, all more or less proceeding from defective organisation, this large expenditure, while accumulating isolated materials of great value, failed to yield any systematic and comprehensive result. At length in 1855 the Court of Directors directed the Governor General to procure by local enquiries, and "with as little delay as possible, such information as may be effective for rendering the work a faithful register of the state of the country as at present existing."*

* Despatch No. 1 of 1855, Statistical Department, dated 21st February 1855.

4. Since then various attempts have been made by the Local Governments to give effect to these orders. It was practically found that no satisfactory basis existed for the work, and as early as 1862 the subordinate Governments began to strike out new plans for drawing up a statistical and geographical account of their territories. In March of that year the Madras Government issued orders for a series of District Manuals, which should exhibit the entire Presidency in minute detail. Subsequently, Sir Richard Temple inaugurated the statistical operations which have produced the *Gazetteer* of the Central Provinces; and more recently the Collectors in Eastern Bengal were directed to draw up a series of District Reports, which were printed in 1868 under the title of the "Principal Heads of the History and Statistics of the Dacca Division."

5. The divergence from the original plan which had thus taken place under the Local Administrations, was accepted by the Supreme Government: and in May 1867 it was suggested whether a work similar to the *Gazetteer* of the Central Provinces might not with advantage be compiled for Bengal, the Panjab, Oudh, Mysore and Curg, British Burmah, and Haidrabad. Three months later the plan received the approval of the Secretary of State, and on the 19th October 1867 the Government of India addressed all the Local Administrations, requesting that "steps may be taken for the compilation of a *Gazetteer* in accordance with the wishes of Her Majesty's Government."

6. Various schemes were set on foot to give effect to these orders, some of them so costly as to be altogether disproportionate to the results to be attained. But His Excellency in Council observes that excessive costliness is not the only unfortunate effect of the want of organization, which left each Local Government to invent a scheme of its own, irrespective of what was being done in other Provinces. There was, in fact, no unity of plan or central supervision, and the results did not contain the materials required for the comparative statistics of the empire. Meanwhile the necessity of some systematic organization had been pressed on the Government of India from various quarters, particularly by the Commercial Community and the Asiatic Society of Bengal. This latter body urged that, without a uniform plan, "the value of each local *Gazetteer* will, in a measure, be depreciated, and whenever the compilation of the *Gazetteer of India* shall be determined on, a considerable amount of the work will have to be gone over again *de novo*." Accordingly, in July 1869, His Excellency in Council declared his conviction that immediate steps should be taken to ensure uniformity, and to that end appointed Mr. W. W. Hunter, LL. D., of the Civil Service, to visit the Local Governments and ascertain what had been done in each, with a view to his drawing up a comprehensive scheme, prescribing the principles for the compilation of the Provincial *Gazetteers* and for their ultimate consolidation into one work.

7. In November 1869 Mr. Hunter submitted his Plan for an Imperial *Gazetteer* of India, in which he exhaustively explained the materials already available, and arranged for that systematic organization and central control, the absence of which had proved fatal to the completeness of all the previous efforts from 1769 to 1855, and to the progress of the present one throughout the fifteen years during which the operations have been going on between 1855 and 1870. The final consideration of his Plan was, however, postponed till the then contemplated Department of Agriculture, Revenue, and Commerce should be formed. Meanwhile his services were temporarily retained on deputation, and after an interval the deputation was renewed with a view to his arranging, so far as his position permitted, for uniformity in the provincial compilations in progress during the past eighteen months. He also continued to perform his duties as Compiler of the *Bengal Gazetteer*.

8. Even the moderate degree of supervision which he was thus able to exercise on the operations, has produced favorable results. The work published during the two years, 1870 and 1871, will form five volumes, containing 2,000 pages, and dealing with a territory of 131,453 square miles. This area, although between two and three times the size of England and Wales, forms only a fragment of the whole work to be done. The general statistical operations will extend over ten separate Governments, which, with their feudatory States, administer a territory of 1,556,836 square miles and govern a population estimated at 200,424,072 souls. The *Gazetteer of India* represents, therefore, a series of local enquiries and comparative statistics spread over an area but little less than that of all Europe, excepting Russia. Throughout this vast territory widely different schemes have been propounded by the Local Administrations, some of them involving a very extravagant outlay, others of too meagre a character. Each Local Government has given its own interpretation to the work, and the experience of the last few years shows that, in the absence of a central organization, the cost of the enterprise will swell to an enormous total, while the same heterogenous incompleteness which rendered all previous efforts infructuous, will again result.

9. Meanwhile the Provincial *Gazetteers* have reached a stage which imperatively demands some uniform system and some guiding authority. It seems to the Governor General in Council that the time has come for taking definite steps to ensure that uniformity of plan without which it is hopeless to look for a successful issue from so widely extended a statistical operation. It is desirable that a large amount of individual freedom should be permitted to

each of the Local Governments, but it is absolutely necessary that each of the Provincial *Gazetteers* should contain the materials requisite for the comparative statistics of the empire. Without a central guiding authority, economy and uniformity are alike impossible. The Governor General in Council is of opinion that this central control can best be obtained by the Government availing itself of the suggestions contained in Mr. Hunter' s Plan, and by securing for the execution of the design the supervision of the designer. Subject to the approval of the Right Hon'ble the Secretary of State, His Excellency in Council is, therefore, pleased to appoint Mr. Hunter Director General of Statistics to the Government of India for the above purpose, and for the consolidation of the Provincial Accounts into the *Imperial Gazetteer*. Mr. Hunter will also continue to conduct the operations of the *Bengal Gazetteer*, the compilation of which, the Government has ascertained, can be carried on in connection with his new duties.

ORDER.—Ordered, that a copy of this Resolution be forwarded, for information and guidance, to the Local Governments and Administrations noted in the margin,* and for information to the several Departments of the Government of India.†

* Government of Madras.
„ Bombay.
„ Bengal.
„ North-Western Provinces.
„ Panjab.
Chief Commissioner of Oudh.
„ „ Burmah.
„ „ Central Provinces.
„ „ Mysore and Coorg.
Resident at Haidrabad.

† Home Department.
Foreign „
Financial „
Military Department.
Public Works „
Legislative „

Ordered also, that a copy be forwarded for information and guidance to Mr. W. W. Hunter, LL. D.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

IRRIGATION OPERATIONS OF FUSL KHURBREEF IN THE PUNJAB UP TO 30th JUNE 1871.

Canal Division.	Water distributed during June 1871.			Navigation Return Canal.	Land irrigated (approximate).		Rain-fall.		Chief crops (approximate).		Remarks.
	Depth in Canal at regulating gauge.			Principal items of Traffic.	Zillah.	Acres.	Average.	During month.	Name.	Area in acres.	
	Full supply.	Actual throughout June.	Estimated full supply. Gross consumption, cubic feet per second.	Up. Down.			Inches.	Inches.			
B. D. Canal. 1st Division	4·90	3·45	.....	.....	Goordaspoor ...	5,375	1·84	4·34	Cotton ...	13,605	806·89 cubic feet per second passed out at the various escapes, of which 530·12 was passed out at the Mullickpoor and Alival escapes for purposes of regulation.
" 2nd " M. B., Lower	4·60	2·09	.....	.....	Umritsur ...	6,235	2·42	7·2	Rice ...	2,158	
" " Lahore Branch ...	3·30	2·71	3,073·6	.....	Lahore ...	18,864	...	...	Sugarcane...	5,655	
					.....	.....	...	...	Others ...	2,156	
Corresponding period, last year ...	.....	.....	3,073·6	Nil.	.....	27,035	...	...	.....	27,035	
Total Baree Doab Canal ...	.....	.....	3,073·6	Nil.	.....	30,474	...	...	.....	30,447	
Western Jumna Canals. Karnaul Division	4·33	3·34	.....	170,739 kurrees, bullies, logs, &c.	Umballa ...	76	4·97	18·23	Cotton ...	69,177	The supply exceeded the demand.
" Delhi " ...	4·40	3·92	.....		Kurnaul ...	16,514	1·91	8·18	Rice ...	3,885	
" Hansi ...	8·30	8·20	.....		Delhi ...	27,257	...	...	Sugarcane...	27,113	380·58 cubic feet per second passed down the Boodhakhera escape.
" Bulla Head ...	8·40	8·00	2,546·0		Rohtuck ...	33,240	...	...	Others ...	5,925	
					Hissar ...	26,903	...	...	Not classified		
					Jheend ...	11,947	...	...	in Hansi		
					Bikaneer ...	163	...	...	Division ...	10,000	
Corresponding period, last year ...	.....	.....	2,546·0	157,003	.....	104,017	...	...	.....	104,017	
Total Western Jumna Canals ...	.....	.....	2,546·0	170,739	.....	116,100	...	...	.....	116,100	The total area (approximate) irrigated up to 30th June is 306·574 acres.
Inundation Canals. Upper Sutlej Division	.....	.....	.....	.....	Lahore ...	2,000	...	1·95	Detail not	.....	
" Lower Sutlej and Chenab	.....	.....	.....	.....	Montgomery ...	26,000	...	...	obtainable	.....	
" Indus Canals ...	.....	.....	.....	.....	Mooltan ...	68,000	...	...	for want	.....	In comparison with the area irrigated up to a similar date last year, there is an increase from the Barce Doab and Western Jumna Canals.
					Dehra Ghazee Khan ...	64,000	...	0·70	of Establishment.	.....	
Total Inundation Canals ...	.....	.....	.....	.....	.....	160,000	...	...	.....	160,000	
Delhi and Goorgaon Works ...	.....	.....	.....	.....	.....	*Nil.*	...	...	.....	*Nil.*	
Total Delhi and Goorgaon Works	.....	.....	.....	.....	.....	*Nil.*	...	...	.....	*Nil.*	
Perennial Canals, corresponding period last year	.....	.....	.....	.....	.....	131,052	...	...	.....	131,052	
Perennial Canal, Grand Total ...	.....	.....	.....	.....	.....	146,574	...	...	.....	146,574	

J. CROFTON, *Lieut.-Col, R. E.,*
Joint Secy. to the Govt., Punjab, P. W. D., Irrigation Branch.

MURRAY;
The 19th August 1871.

No. 35 of 1871.

SUPPLEMENT TO The Gazette of India.

SIMLA, SATURDAY, SEPTEMBER 16, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

Non-Subscribers to the GAZETTE *may receive the* SUPPLEMENT *separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.*

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA *is required by Law, of which it has been customary to publish in the* CALCUTTA GAZETTE, *will be included in the* SUPPLEMENT. *For such Orders and Notifications the body of the* GAZETTE *must be looked to.*

GOVERNMENT OF INDIA.

HOME DEPARTMENT.

Introduction of Animal Vaccination in Upper Scind.

From the HON'BLE F. S. CHAPMAN, Chief Secretary to the Government of Bombay, to the Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce,—No. 2313, dated Bombay Castle, the 23rd August 1871.

* Memorandum from the Commissioner in Scind, No. 568, dated 10th May 1871, with accompaniments.
Report by the Superintendent General of Vaccination, No. 168.
Report by the Inspector General, Indian Medical Department, No. 2047, dated 23rd May 1871.
Government Resolution No. 1434, dated 2nd June 1871.

I AM directed by the Right Hon'ble the Governor in Council to acknowledge the receipt of Mr. Under Secretary Geoghegan's letter No. 81, dated the 11th instant, and, in reply, to forward herewith copy of the papers* therein asked for, relative to the introduction of animal vaccination in Upper Scind.

From R. WALLACE, ESQ., Acting Collector of Shikarpore, to the Commissioner in Scind,—No. 1238, dated Shikarpore, the 3rd May 1871.

I HAVE the honor to submit a copy of a letter No. 71 of 1871, from Dr. J. Leahy, in medical charge of Sukkur, to my address, reporting the first results of the experiments now being tried here of vaccinating from the calf direct.

2. The municipality of Sukkur voted a grant for the above purpose, and Dr. Leahy, at my request, consented to carry out the experiment in addition to his other duties.

3. Though there is some opposition on the part of the Hindoo community, I attribute it to their narrow-minded dislike to all innovation and change.

4. I anticipate that, in course of time, these prejudices will pass away, especially under the active superintendence of Dr. Leahy, who is already very popular among the townspeople.

5. It will be necessary to allow a considerable interval to pass before the results of this experiment can be truly judged; but if, as is supposed, the lymph from the calf retains its full virtue during the hot months, the importance of the new process will be unquestionable.

6. I beg to submit that the exertions of Dr. Leahy in this matter are most creditable to him; and that the public are indebted to him for the trouble and care he has bestowed in carrying out the first attempt to introduce animal vaccination into Scind.

From HONORARY ASSISTANT SURGEON J. LEAHY, in medical charge, Sukkur, to the Acting Collector and Magistrate, Shikarpore,—No. 71, dated Sukkur, the 27th April 1871.

WITH reference to former demi-official correspondence regarding the introduction of animal vaccination into Upper Scind, I have the honor to report, for your information, that the experiment has been in operation here for the last six weeks, under my superintendence, and has proved completely successful.

2. For about three weeks the experiment was conducted in old Sukhur; but calves of a suitable age being no longer procurable there, arrangements were made to obtain a supply in New Sukhur, and up to the present time I have had no difficulty in getting as many as I require.

3. With the view of testing the experiment, I vaccinated several children in Old Sukkur with lymph taken from a calf, and on the same day vaccinated a number of other children with human lymph. The result on contrasting the arms of the two sets of children was highly satisfactory. The vesicles produced from ordinary lymph were by no means of an inferior character, but they were certainly not quite equal to those produced from animal lymph. The latter were full and well formed, and on the eighth day presented in a marked degree the characteristic appearance of the genuine vaccine vesicle.

4. Dr. Keith, now Acting Superintendent of Vaccination in Scind, who is here awaiting a passage to Kotree, very kindly visited Old Sukkur with me this morning, and examined several children vaccinated a week ago with animal lymph. He afterwards accompanied me to the dispensary in New Sukkur, and witnessed the inoculation of four calves from other calves operated upon six days ago, as well as the vaccination of several children from animal lymph. He expressed himself highly gratified with the appearance of the vesicles on the children's arms, and with the quality and quantity of the lymph obtained from the calves.

5. It is a matter of very great satisfaction to me that Dr. Keith should have had an opportunity of observing the manner in which the experiment is being carried out, and of noting its success.

6. The Mahomedans do not seem to have any particular objection to animal vaccination, nor do they object to allow their calves to be operared upon. The Hindoos, on the other hand, not only have a strong prejudice against the use of animal lymph on their children, but appear to look upon the inoculation of their calves as a most aimless piece of cruelty and a great sin.

7. I may mention that the experiment is being conducted at a very trifling cost, and that I shall continue it so long as calves are procurable.

8. I beg to bring to your notice the valuable assistance I have received from Mr. Kadiedad Khan, Mooktyarkar of Sukkur, and from the Fouzdar of New Sukkur in obtaining a regular supply of suitable calves.

From COLONEL W. L. MEREWETHER, C. S. I., Commissioner in Scind, to the Acting Collector of Shikarpore,—No. 567, dated Kurrachee, the 10th May 1871.

IN reply to your letter No. 1238, dated the 3rd instant, I have the honor to inform you that I quite coincide in the encomiums bestowed on Dr. Leahy, for his exertions in connection with the introduction of animal vaccination in Upper Scind, and request you will be good enough to convey my best thanks to that officer.

2. I would also particularly acknowledge the readiness shown by you in supporting the attempt to introduce animal vaccination in your District.

No. 568.

COPIES submitted to Government for information.

Memorandum by SURGEON J. PINKERTON, Superintendent General, Vaccination,—No. 168.

THE experiment of Dr. Leahy, as far as it has gone, is very satisfactory and interesting. I hope he will be able to continue the practice of animal vaccination in Upper Scind. The Hindoos in Bombay have taken readily to animal vaccination, so it may be expected that they will also do so in Scind when they become better acquainted with it.

2. I would beg to suggest that Government acknowledge the services of Major R. Wallace and Dr. Leahy. Although Major Wallace says little or nothing of what he has himself done, I know that it is through his influence and countenance that Dr. Leahy has been able to commence animal vaccination.

Report by A. WRIGHT, ESQ., Inspector General, Indian Medical Department,—No. 2047, dated Bombay, the 23rd May 1871.

THE success of the experiments made by Honorary Assistant Surgeon Leahy in animal vaccination is very gratifying, and I consider him deserving of the acknowledgment of Government for his exertions in the matter.

Extract from the Proceedings of the Government of Bombay in the General Department,—No. 1434, dated Bombay Castle, the 2nd June 1871.

Memorandum from the Commissioner in Scind, No. 568, dated 10th May 1871, submitting, for information, copy of a correspondence with the Acting Collector of Shikarpore, relative to the first results of the experiments tried by Dr. J. Leahy, in medical charge of Sukkur, in connection with the introduction of animal vaccination in Upper Scind.

Report by the Superintendent General of Vaccination, No. 168, submitting his remarks on the above.

Report by the Inspector General, Indian Medical Department, No. 2047, dated 23rd May 1871, stating that the success of the experiments made by Honorary Assistant Surgeon Leahy in animal vaccination is very gratifying, and that he considers him deserving of the acknowledgment of Government for his exertions in the matter.

RESOLUTION.—Government have much pleasure in acknowledging Dr. Leahy's successful exertions in introducing animal vaccination in Upper Scind, and are glad to observe that the Acting Collector has taken such a warm interest in the matter.

(True Extract.)

(Signed) F. S. CHAPMAN,

Chief Secretary to Government, Bombay.

Loss of human life and cattle from wild animals and poisonous snakes, and measures taken for their destruction, &c., &c.

TOWARDS the close of the year 1868, a scheme, submitted by Captain Rogers, of the Bengal Staff Corps, for the destruction of wild animals, and a suggestion made by the Foreign Department for the revision of the existing system of rewards for such destruction, led to a review of the losses occasioned from year to year, both of life and property, by tigers, panthers, wild elephants, snakes and other noxious animals all over the country, with a view to the determination of the best means that could be adopted for their extirpation. No single report or compilation was however extant which would give sufficient, if not complete, information on the subject,—accounts of the depredations committed in the several provinces by beasts of prey being scattered over a variety of documents, such as survey reports, general administration reports, applications for sanction to the offer of rewards, special reports of missionaries residing in the interior, &c., &c. But the few papers that could be collected at the moment were enough to convince the Governor General in Council that the annual loss of human life and of cattle, and the injury to crops caused by these scourges, were exceedingly great. Whole villages were at times completely depopulated; public roads and thoroughfares rendered literally unapproachable by human beings even in broad daylight; and thousands of acres of once

cultivated land were in consequence entirely deserted and consigned to the growth of brush-wood and rank vegetation, to offer in their turn safe coverts to these noxious animals, and enable them to do more havoc in the surrounding country.

It appeared from the Central Provinces Revenue Survey Report for 1867-68 that great obstruction was caused to the operations of the survey party by the depredations of tigers which infested the district where it was employed. A tigress was represented to have killed 127 people and stopped the traffic for many weeks on the road between Moolb and Chunda, until she was shot by Lieutenant Coddington. In the Topographical Survey Report of the Bengal Presidency for 1867-68 it was stated that "in the Central Provinces the Surveyor came across a tract which had been utterly devastated by a single tigress, which was estimated to have killed upwards of 50 people and was known to have driven the inhabitants away from 13 villages." Certain proceedings volumes of the Madras Government that were laid before the Governor General in Council also contained terrible accounts of the ravages committed by tigers, leopards, and other wild animals. A report by the Collector of South Canara, dated the 16th February 1868, stated: "The depredations caused by tigers and *cheetahs* have of late been somewhat serious in the district, and even the town of Mangalore itself is not free from their incursions. In the month of June 1865 it was reported that, during the previous twelve months, no less than sixteen human beings had been carried off in the Udipi and Candapore Talooks, and, in the rest of the district, the loss of life by this cause only was gradually on the increase. In addition to this the losses by the villagers of their cattle, goats, and pigs were in some localities very considerable." The Collector of Kurnool, under date the 9th October 1867, reported that, up to the end of September preceding, a man-eating tiger had carried off no less than 64 human beings, and had caused such a terror that the post runners and beat constables would not traverse the ghat until large numbers of persons collected together and procured numerous tom-tom beaters to accompany them, and that the coolies of the Public Works Department had stopped work through fear of attack by this tiger.

The proceedings of the Government of the North-Western Provinces were also not wanting in horrible accounts of ravages committed by wild beasts. A report by the local Board of Revenue, dated 7th December 1867, contained the following mournful narrative of the destruction of life caused by a single bear in a northern village bordering the forest.

"About midnight, whilst most of the cultivators were out watching their rubbee crops, and there were only some fourteen or fifteen people in the village, a bear in the short space of two hours killed two men, three women and one child, also wounding two men. He first entered the house of one Ahmed Yar Khan, Pathan, and killed two women. He next destroyed Sobrattee Dhobee, who had come to the assistance of the women. He then entered the house of Elahi Buksh, butcher, and killed his wife and child. The husband attacked him with a knife, but the bear appears (from the investigation) with one blow to have torn away his head and face. On retiring from the village he attacked six head of cattle, three of which died before morning. The cries from the village attracted the attention of two of the cultivators, who, proceeding from their fields to ascertain the cause, met the bear a short distance outside the village. He immediately attacked them, wounding them both, but the wounds were not serious. The following night the animal entered the adjoining village of Pertabpore. He there entered the house of a "Raee" and wounded his wife; he then attacked the man and had succeeded in wounding him badly on the arm, when he was shot by a man named Waly Mahomed." * * *

The police reports of some of the provinces showed that the Local Governments and Administrations were quite alive to the necessity of driving away these wild beasts from the vicinity of the habitations of men, and rewards were most liberally dealt out for their destruction. But enormous numbers of men, women, and children still continued to fall victims to their ravages year after year.

So early as March 1834 the Secretary of State had noticed the serious devastations caused by tigers, wolves, and other wild animals, and thought it not improbable that the failure of the handsome rewards offered for their destruction in producing the desired effect might be partly owing to the villagers having been deprived of their arms through the operation of the General Disarming Act. He therefore commended the subject to the consideration of the Government of India, and desired that, if deemed necessary, the inhabitants of those villages which suffered most from the ravages of wild beasts might be allowed to retain such arms as were absolutely necessary for the protection of themselves and their property. This despatch being circulated through the Government of Bengal to the several Divisional Commissioners in the Lower Provinces, a discussion took place as to the adequacy or otherwise of the authorized rewards, resulting in some cases to an enhancement of them. The Bengal Government also suggested to the Commissioners that strychnine might be used with advantage and without risk by being introduced into the body of a cow or other animal after it had been killed by a tiger. But nothing was said in the correspondence that ensued to lead to the conclusion that the operations of the Arms Act had in any way contributed to aggravate the evils complained of.

A separate correspondence was at this time going on with the Local Governments and Administrations on the subject of the Arms Act, from which it became abundantly manifest that the loss arising from the destruction of crops by wild elephants, pigs, &c., was very considerable.

Captain Rogers' scheme, referred to at the commencement of this memorandum, consisted of a contrivance devised by him, a sort of a spring-gun, already in use in many parts of the country. The main details of the invention are contained in the following paragraphs extracted from his letter:

"With regard to the weapon I propose the use of the old muskets that have merely a nominal value as iron, and are constantly being taken up and sold as such. * * *

"An adjustment attached to the trigger is the only expense, and this would not exceed four annas per musket.

"There are three strings attached to this trigger adjustment. The one marked A is the fatal one, and running along the barrel crosses the path these animals frequent, and is set at the height of the shoulder of the beast it is desired should be killed, and that string represents the line of fire. The bullet, therefore, invariably enters the most fatal part. It is a well-known fact that wild beasts do not wander as animals of the deer tribe do all over the jungle, but invariably travel by paths and roads through the jungle when going for food or water; and in the event of one being killed and another coming to the same district, the chances are ten to one that animal will use the same paths and roads and take up his quarters in almost exactly the same spot as his predecessor. Their haunts and walks are well known to every shikaree in the district, and it would be a matter easily determined as to where to set the gun, to ensure the animal's destruction before it had time to do much injury.

"To prevent destruction of animals that should not be destroyed, there are two other strings attached to the trigger, and these (marked B B) are laid at such a height from the ground as to allow a tiger or other animal it is wished to kill to pass underneath without touching.

"Cattle or persons coming in contact with these strings cause the gun to go off, and its fire is perfectly harmless."

Captain Rogers depicted in strong and vivid colors the immense and irreparable injury caused by wild animals in remote parts of the country, as will be seen from the following extract from his letter:

"By killing as they do these cattle, not only are the villagers losers, but also the Government in an indirect way.

"It is by these people—and these people again assisted by their live agricultural stock—that the vast jungles are becoming tracts of cultivated country, but the wild beasts greatly retard the same and act as a considerable check on the energies of those unfortunates, who are now, to a great extent, at the mercy of any tiger or other beast of prey that may take up its quarters in their district.

* * * * * *

"No thefts or murders in India can exceed the horrors and misery caused by the wild animals, and no picture or language can give even a faint idea of the sufferings of their victims. Those poor creatures, living as they do, for the most part, in districts seldom or ever visited by any European except an occasional sportsman, are obliged to bear their losses or sufferings with little or no chance of the same being brought to the notice of the Government whose subjects they are.

* * * * * *

"A short time since I would have scorned the idea of killing a tiger or other beast by stratagem, and would have felt the most supreme contempt for any English sportsmen doing so.

* * * * * *

"I now look upon it in the light of a question involving the lives of hundreds of persons yearly, and, in a second and less serious light, as affecting the loss of cattle to the value of very many lakhs of rupees for the same period, and the same being almost entirely the only worldly property of thousands of half-starved creatures of a much more honest and truthful disposition than the inhabitants of the towns and villages in the immediate vicinity of our stations." * * * * * *

Captain Rogers would organize the shikarees of every district into regular bands with jemadars over them, and supply them with guns and ammunition, exempting these selected shikarees from the usual payment for licenses for their guns. He said that where bows and arrows were used by the natives, the same contrivance, as that suggested by him, would operate with fatal results in the destruction of wild animals. He would fix the reward at Rs. 8 only, "but never more, except under special circumstances, having no reference to the damage the tiger is doing, but to any extra trouble or injury the shikaree has sustained in killing it."

Captain Rogers further proposed that the skins of animals and their claws should become the property of Government. "These," he said, "will realize a large sum of money, and with a little management a number of valuable skins can be brought into the market; and a small sum being given for skins on which care had been bestowed would soon induce the natives to give them up in a better condition than at present."

As to accidents, Captain Rogers himself was not very hopeful. In fact, in saying "that accidents will and must happen," he seemed perfectly conscious that a material defect in his contrivance was that it would be as likely to kill a noxious animal as the bullocks and buffaloes belonging to the poor people intended to benefit.

At this time the Foreign Department forwarded, for consideration, along with Captain Rogers' scheme, copy of a correspondence with the Chief Commissioner of the Central Provinces, on the subject of the rewards offered for the destruction of wild animals and of poisonous snakes, together with a letter from Mr. Biss, Deputy Accountant General of those Provinces, recommending, with reference to the increasing expenditure on account of rewards for killing snakes, that municipalities should be required to pay for the destruction of snakes within towns, in order to secure that no rewards were given for snakes killed in the jungles. Another communication was received from the Foreign Department, which showed that it had been decided in the Financial Department, that the attempt to extirpate snakes by means of a reward had proved a failure in the Lower Provinces.

Foreign Department, No. 1958, dated 30th September 1869.

A circular* was accordingly issued ordering the discontinuance of rewards for killing venomous snakes, pending the issue of final orders on the general question of the destruction of noxious animals. As regards the general question, a copy of all the available papers with Captain Rogers' letter was forwarded to the Local† Governments and Administrations, and reports called for showing, for the years 1866-67 to 1868-69,—

* Resolution Nos. 636-47, dated 2nd February 1870.

† Circular dated 29th January 1870.

(1) the loss of human life from the several kinds of wild quadrupeds;
(2) the loss of cattle or crops from the same cause;
(3) the number of various kinds of animals killed;
(4) the system for their destruction at the commencement of the period, and any changes introduced during the three years;
(5) the cost to Government of the measures adopted;
(6) the operation of special systems or scales of reward (if any) tried in particular localities.

Opinions were also asked as to the measures which should be adopted in future, with special reference to Captain Rogers' proposals, it being added that no increased expenditure could at present be sanctioned in this matter. The Local Governments and Administrations were requested to give the same information regarding poisonous snakes as in the case of noxious quadrupeds, and, where rewards for the destruction of snakes had been once in force but were withdrawn, to show the result of the withdrawal.

Another circular was subsequently issued on a kindred question under the circumstances, and with the specific object described below.

In a communication dated the 25th August 1869, to the address of the Financial Department, already noticed above, the Deputy Accountant General of the Central Provinces wrote as follows, speaking of the enormous sums annually spent in rewards for the destruction of wild animals—

"4. Then, again, if we pay largely for the destruction of animals having handsome skins, it might be worth while to pay a little more, and by having them properly tanned, convert them into saleable goods. For instance, within the last four months, 50 tigers were killed in Raepore, costing Government Rs. 2,550. And as there is a school of art at Raepore, it would almost seem worth while to have marketable skins properly tanned there. There would be a good market for good skins at Nagpore, and there would be no cost of transit, as they could always be brought down by my treasure parties."

Precisely at this juncture, Captain Rogers forwarded a letter from one Mr. J. Rowland, Jubbulpore, offering to purchase these skins at a contract price, and applying for a monopoly "of all skins of wild beasts killed throughout India." He said that, provided the skins were delivered up in certain easily accessible towns, and in as perfect a condition

as possible, he could enter into a contract for paying for one year certain, renewable, if required, the prices noted below:

	Rs.
Tiger, *Cheetah* / Panther or leopard	10 each.
Bear	2 „
Wolf or hyena	1 „

This led to the issue of a circular* enquiring whether, under the present system of granting rewards for the destruction of wild animals, the skins of the animals killed became, in any case, the property of the Government, and if so, how they were disposed of.

* Dated 19th August 1870.

Replies have been received to both the above circulars. The following tabulated returns show the substance of those replies on the points specifically referred to in the circular of the 29th January 1870, and on the question put in the circular of the 19th August 1870. The suggestions made by the several Local Governments and Administrations regarding the method that should be adopted in future for the extirpation of wild animals and venomous reptiles, and their views on the important question generally, will be found summarized in the sequel.

ABSTRACT.

Loss of life in the three years of* 1866-67, 1867-68, *and* 1868-69, *from wild beasts and venomous snakes, and the amounts disbursed in rewards for killing them, mostly the former.

PROVINCE.	Killed by wild beasts.	Deaths from snake-bite.	Total number of deaths in the three years from both causes.	Amount spent in reward.
				Rs.
Madras	888	760	1,648	38,803
Bombay (exclusive of Sind, &c.)	148	588	736	19,679
Bengal	6,741	14,787	21,528	62,812
North-Western Provinces ...	2,168	2,474	4,642	18,474
Punjab	310	1,064	1,374	60,693
Oudh	569	3,782	4,351	10,728
Central Provinces	1,347	1,961	3,308	1,65,773
Coorg	147	Not given.	147	12,520
Hyderabad	129	226	355	14,273
British Burmah	107	22	129	2,000
GRAND TOTAL ...	12,554	25,664	38,218	4,55,755

It will be seen from the foregoing abstract that the total *reported* loss of human life in India in the three years of 1866-67, 1867-68, and 1868-69, from wild beasts and venomous snakes, was no less than 38,218* or 12,736 per annum; and that the expenditure incurred by Government in rewards for the destruction of noxious animals amounted to Rs. 4,55,755, or Rs. 1,51,918 per annum. Bengal appears to have suffered most, upwards of twenty-one thousand lives having been lost during the period, that is, nearly five

* Wild beasts 12,554
Snakes 25,664
Total ... 38,218

thousand more than the number lost throughout the rest of India. This certainly throws serious doubts on the accuracy of the returns from the other Provinces. Next to Bengal are the North-Western Provinces; Oudh, the Central Provinces, and Madras stand third, fourth, and fifth, respectively; British Burmah showing the least loss of all. As regards expenditure, the Central Provinces stand first in the list, having spent a lakh and sixty-five thousand rupees, that is, nearly three times as much as Bengal. Next to the Central Provinces stands Madras, where the expenditure amounts to eighty-eight thousand rupees. Bengal stands third in this respect, having spent only sixty-two thousand rupees; Punjab is fourth, and British Burmah has been the least expensive of all.

The loss of cattle and crops has also been, no doubt, large, although the returns do not contain full information on this point. In several parts of the country, the zemindars and the people themselves are left to take the necessary steps for the protection of cattle and crops; but no responsibility is anywhere attached to the former in this important matter.

The excessive expenditure in the Central Provinces may be, in some measure, owing to the extremely high scale of rewards prevailing in those Provinces. One hundred rupees for a "man-eating" tiger, and fifty rupees for a "full-grown" tiger, are not paid anywhere else. It may not be possible to secure uniformity in regard to the scale of rewards. But presumably the Government of India can, with great advantage, lay down a maximum limit for each species on a consideration of the rates prevailing in the different parts of the country, leaving it to the local Governments to propose higher rewards in the case of any specially destructive and dangerous animals.

None of the Local Governments suggest any specific measures for adoption beyond the system of rewards now in force; and almost all subordinate officers whom they have consulted agree in condemning Captain Rogers' mechanism as unsuited to the territory under their jurisdiction, or as dangerous and full of risk to human beings and domestic animals. For a brief analysis of the opinions given by the Local Governments, the reports may be divided into three heads—

(1)—destruction of wild animals and Captain Rogers' plan,

(2)—destruction of poisonous snakes, and

(3)—disposal of the skins of the wild animals killed.

As regards the destruction of wild animals and Captain Rogers' plan, local officers in the Lower Provinces consider the system of offering rewards to be practically the best, and recommend no change in this respect. The Lieutenant-Governor thinks that much good would be done by encouraging local officers in Districts in which the loss of life and of cattle is great, "to organize at suitable seasons, and at a small expense to Government, large hunting parties to destroy the particular class of beast found to be destructive," as such a course would give the people courage, and incite them to organize similar hunts themselves, and also teach them to make a stand against a danger that is now destroying their substance and themselves. His Honor would also encourage the police to destroy noxious wild animals by allowing them the usual rewards. His Honor doubts whether Captain Rogers' plan "is not as dangerous to cattle and human beings as to the noxious animals it is intended to destroy." It is stated that the system of rewards is of no practical effect in Behar, owing to the prejudices of the people; but no special remedy is suggested, although it is admitted that in this District people suffer most from the ravages of tigers, &c. In such cases the point for consideration evidently is, whether a special scale of rewards should not be offered to tempt *shikarees* from other parts of the country, instead of suffering the poor people to fall victims to their own prejudices.

The Madras Board of Revenue considers it "the bounden duty of Government to do something for the destruction of wild animals, and the protection of life and property from their ravages," but does not think it necessary to depart from the present system of rewards. The Board condemns Captain Rogers' scheme as unsuited to the circumstances of that Presidency, in which the people have not been disarmed, and in which, wherever there are jungles, there are numerous *shikarees* of different races and families, who are naturally impatient of control, and could never be brought to submit themselves to a jemadar. Besides the *shikarees* know how to set spring guns. The Government of Madras concurs in the above opinion. It has requested the Board of Revenue to arrange for reports by heads of villages to the nearest police station of the loss of human life, cattle, and crops, and has called for its opinion whether it may not be desirable to authorize Tehseeldars to disburse the rewards at once, under certain restrictions, as to amount, instead of requiring that the cases shall be sent up to the Collector or District Officer for disposal.

The views of the Bombay Officers are equally strong against Captain Rogers' plan. The Revenue Commissioner of the Northern Division remarks that "Captain Rogers' plan is universally disapproved by every one consulted on the subject. It appears to be known in the Districts, but only rarely resorted to." He thinks the plan in use of destroying a

beast by poisoning the carcase of an animal killed by it is so simple and sure that there is no need for further improvement in this way. He adds—"So far from tigers being on the increase in this Division, it is complained by the District Officers that the country is gradually denuded of big game, and there is nothing left to shoot." The Bombay Government agrees in the above opinion of Captain Rogers' proposals, and states that the measures hitherto adopted have been, on the whole, fairly successful and need no modification.

The Government of the North-Western Provinces writes. "Upon the whole, the Lieutenant-Governor is of opinion that the existing system answers well, and no material alteration need be recommended. Wherever there is any unusual prevalence of destructive animals, His Honor considers that the Government should have authority, as within budget limits it already possesses, to increase the rates of reward for their destruction. And where individual animals become notorious as occasioning loss of life, such as man-eating tigers and rogue elephants, liberal rewards should be offered on special parties organized for killing them." His Honor does not approve the adoption of Captain Rogers' plan. The use of poison is recommended by some officers, but it does not appear to have been anywhere adopted. His Honor considers that there is obvious danger in a resort to this practice, and is, therefore, unable to recommend its indiscriminate adoption. But he does not explain what that danger is. The Superintendent of Dehra Doon strongly advocates the plan of putting strychnine in the carcases of animals killed and left by tigers before they come back to eat them.

The Lieutenant-Governor of the Punjab agrees with the conclusion arrived at by a majority of local officers that the existing system of rewards is sufficient, and no change is desirable. Captain Rogers' plan is generally pronounced to be unsuitable to the Punjab. His Honor writes that it is a known and undisputable fact that the number of wild animals is rapidly decreasing in the Punjab, and that, if their destruction proceeds at the same rate as at present, the more dangerous animals will at no distant date be altogether exterminated. The chief cause of this diminution, he thinks, is the rapid increase of the population, and the immense extension of cultivation in the Province, which has reclaimed vast tracts formerly covered with jungle, and affording shelter to wild beasts.

It will be noticed that the Punjab Government "does not directly stimulate the destruction" of animals whose depredations are confined to crops, being of opinion that "the peasants may reasonably be expected to guard their own fields."

The Chief Commissioner of the Central Provinces disapproves Captain Rogers' plan as altogether unlikely to secure the object sought. He observes that if *shikarees* cannot now be had in numbers sufficient to keep down the wild animals, it is not likely that more men will adopt the profession when a license tax is levied on them, and when the rewards obtainable for killing the more dangerous animals are very much reduced. He is of opinion that the system of rewards promises better results than any other plan, and he would not recommend the introduction of any change. Spring guns, traps and nets may be and are used by persons who adopt hunting as a calling, and the Chief Commissioner does not think it necessary for Government to employ a set of men for trying to kill wild animals with any particular kind of weapon. He says—

"If the rewards now paid by Government are high, then many persons will be induced to adopt hunting as a profession. Many animals will be killed; and the more killed, the fewer will remain, and these fewer will become more difficult to find; the number of animals killed will decrease, and with it naturally the expenditure of Government. The high reward will thus result in the more speedy extirpation of these animals. But for Government to take upon itself the task of ridding the country of noxious animals, and employ a body of men for this purpose, forbidding other men to follow a hunter's calling, would be, in the Chief Commissioner's opinion, a mistaken measure."

In the Central Provinces also, the destruction of animals dangerous to crops is left to the people themselves, the measures of Government being confined to those that are dangerous to human life.

The Oudh and British Burmah authorities also support the existing system of offering rewards, and do not consider any other measures requisite.

The Resident at Hyderabad approves the existing system of offering rewards, and does not consider any change necessary. The Deputy Commissioner of Booldannah says that, in the last few years, the wild animals are becoming much fewer in number, and that such an animal as a tiger will before long not be heard of in that District; he thinks Captain Rogers' plan to be a "dangerous one, and more likely to lead to the death of cattle and human beings than of tigers."

The officers consulted by the Chief Commissioner of Coorg are of opinion that the continued payment of rewards, at an increased scale, will effect the gradual extripation of the most dangerous and destructive class of wild beasts. The Chief Commissioner concurs

in this view but says that, "in certain localities, so as to effect the destruction of particular animals, some of Captain Rogers' suggestions might be adopted with advantage." He, however, does not specify the suggestions.

As regards snakes, although the number of deaths from this preventible cause is exceedingly large—more than double of the mortality from the depredations of wild animals of all kinds taken together,—yet the Bengal Government considered it expedient to discontinue of its own motion the grant of rewards for killing poisonous snakes in the only District in which it was ever allowed. The logic of its argument that, because the people were ready enough to kill snakes, and even to bring them from the jungles for the sake of a reward, they will do so for their own sakes without a reward, is not at all clear. A man may kill a snake now and then, when he meets one; but the question is, whether such occasional destruction at the will or caprice of particular individuals will be sufficient to effect any sensible diminution in the number of poisonous snakes, or to extirpate them from the habitations of men. The Bengal Government simply says that the offer of rewards does not answer the real object in view, without explaining in what particular respect it has failed.

The Madras Board of Revenue considers it desirable that the prohibition against granting rewards for killing venomous snakes should be removed, and the Local Government concurs in this opinion.

In the Bombay Presidency the Commissioner of the Southern Division does not think the grant of rewards for the destruction of snakes to be necessary. The Commissioner of the Northern Division on the other hand says:

"Death from snake-bites is far more to be dreaded and guarded against than the ravages of wild beasts. Rewards for the destruction of the latter are at present held in abeyance; but when the restriction is removed, it will be advisable to offer a scale of rewards for the destruction of snakes rising from half an anna for ordinary snakes to two annas for cobras, phooras, and other highly venomous kind."

In the North-Western Provinces the loss of life from snake-bite is enormous, though not so heavy as in Bengal. Nearly 2,500 men died premature deaths from this cause alone during the three years under report. But except in the District of Humeerpore, no rewards were ever offered for killing these dangerous reptiles. Even in that District the offer of reward was withdrawn after two or three months' trial, the local officers being of opinion that "it is of no use to offer rewards for destroying snakes. Their slaughter, when met with, is too easy, and the impulse to kill them too instinctive to need artificial stimulus." The Lieutenant-Governor does not believe that any sensible diminution can be effected in the number of snakes by any system of rewards. He would not offer any rewards, because they are already pursued as the natural enemies of the human race whenever they show themselves by all excepting the few who are withheld from injuring them by religion. But it appears to be forgotten that, although followed, "as natural enemies of the human race, and easily slaughtered when met with," yet nobody will devote his time to search out a snake, or take any trouble to kill it when met with, unless it were in the hope of earning a reward. As in the case of wild beasts, the existence of a system of rewards gives birth to a race of professional hunters, so in the case of snakes such a system would create a race of snake-catchers, who would make it the business of their lives to search out and destroy these natural enemies of human life.

No rewards have ever been offered in the Punjab for the destruction of snakes, although "for every person killed by wild beasts five die from the bite of snakes." The majority of the local officers consulted are opposed to the grant of rewards. But the Lieutenant-Governor is disposed to think the experiment worth trying. He writes:

"The reason urged against the grant of a reward, *viz.*, that snakes are already destroyed without reward, wherever found, is not of much force; for, as a matter of fact, the natives are generally very superstitious on the subject of snakes, and are very unwilling to kill them. The number of deaths from snake-bites is so large that, if there appear any reasonable hope of checking the mortality, it would be the clear duty of the Government to attempt to do so. The Lieutenant-Governor's experience in Oudh leads him to hope for success in this direction, and he would willingly give the experiment a fair trial."

Nearly two thousand lives were lost in the Central Provinces from snake-bite during the three years under report. But the Chief Commissioner sees little chance of any scheme being devised whereby more snakes would be killed than at present. His reasons are similar to those advanced by others who are of the same opinion with him. "Snakes are only dangerous in the haunts of men, and, when seen, they are, as a general rule, at once killed." Officers who are of this opinion necessarily ignore the deep-rooted and universal superstition prevailing among the natives on the point of snake-killing, except among certain lower castes inhabiting particular localities, such as *Domes* in Lower Bengal.

The Oudh report states that "it is clear that, without payment, the professional snake-killers will not kill snakes."

The Chief Commissioner of British Burmah advocates the introduction of rewards for killing snakes, and recommends a scale for the sanction of Government.

The Hyderabad officers deprecate the discontinuance of rewards. The Commissioner of East Berar proposes a scale for sanction, and the Resident supports his recommendation.

In Coorg certain municipalities grant rewards for the destruction of venomous snakes; and the Commissioner of Astagram recommends that where these reptiles abound, and where there are no municipalities, the Government should give rewards from the imperial revenues. The Chief Commissioner is of opinion that the scheme might be adopted as an experimental measure.

As regards skins. It will be seen from the foregoing tabular returns that, at some places, it is the practice to take over the skins of the animals killed at the time of awarding the rewards, and dispose of them to the best advantage, crediting the proceeds to the imperial revenues. But thus locally disposed of, the income derived from the sale is admitedly very trifling. At others again, those skins are allowed to remain with the *shikarees* themselves as a portion of their reward, or are thrown away as of no value whatever. Where the *shikarees* are allowed to appropriate the skins, they do not seem to attach much value to them, and the consequent increased inducement to kill wild animals is very slight indeed. It may be noted that one important and valuable end which the appropriation of the skins in behalf of Government would serve is that it would afford a check upon the disbursement of rewards by the mofussil police and revenue officials. No uniform rules appear to exist for ensuring that the amounts debited to the account of wild beasts should be in reality devoted to that end, instead of being misappropriated by the subordinates of the departments entrusted with the duty of awarding these rewards. At some places, the officers in charge of the mofussil police stations are allowed uncontrolled authority in the disposal of the available funds. At others, the rules require application to be made to the higher authorities at the sudder station. Frauds have often been discovered in the Bombay Presidency in the distribution of rewards for the destruction of wild animals, and the last one was of the most wholesale description imaginable.

The following extract from the Proceedings of the Bombay Government, connected with a recent case of fraud, will show to what extent funds assigned by Government for the destruction of noxious animals are capable of being misappropriated under the existing system:

Revenue Proceedings for October 1870.

"A most impudent fraud has been practised.

"2. It appears that the average annual payments for the destruction of wolves in the Seerpore Talook of Khandeish was Rs. 390; whereas, from the 31st March to the 21st May 1869, no less a sum than Rs. 3,381 was paid on this account. Of this sum Rs. 581 was disbursed by order of the Mumlutdar Suddashiv Gopal between the 31st March and 23rd April. On the latter date the mamlutdar went on leave, and the Head Karcoon, Luximon Janardon, took charge. Between then and 21st May he managed to pay away Rs. 2,800. The fraud was then discovered.

"3. The following extract from the Report of the Collector and Magistrate shows the barefaced manner in which this system of robbery was carried on:

"'There is reason to believe that no trouble was taken to procure even a few wolf skins to give color to the fraud; for, of the 45 skins which were seized when the fraud was discovered, and for which an order had actually been written on the treasury to pay the rewards, there is not a single wolf skin. They consist of village cat skins, fox skins, jackal skins; and it is probable that the whole of the rewards were paid on this lot of skins brought up over and over again, some of them having been torn across and sewn up again.'

"4. The rules for payment of rewards require that the skins should be accompanied by a report from the village officers, stating that the bearer had killed the animals in question, and was entitled to the reward. An examination of the skins has also to be made by a *punchayet* or jury. These rules were duly observed, but false reports were received from the villages; and any person who happened to be present in the kutchery was made to go through the form of singing the report of the jury."

The opinions of the Local Governments on the point are based upon the insignificant sums that skins now fetch if sold at the local markets, and this is distinctly stated in the reports of some of them. For instance, the Lieutenant-Governor of Bengal says, that "the revenue derived from the sale of skins must be very trifling," and, therefore, recommends that they may be left in the possession of the *shikarees*. The Lieutenant-Governor of the North-Western Provinces remarks that the skins "are probably more valuable to the *shikarees* than to Government, as the former has better opportunities of disposing of them."

No. 4202.

Extract from the Proceedings of the Government of India in the Home Department (Public),—dated Simla, the 11th September 1871.

READ again the under-mentioned correspondence on the general question as to the best means of securing the destruction of noxious animals and poisonous snakes, and on the present practice of disposing of the skins of such animals:

From Foreign Department, No. 1958, dated 30th September 1869.
From „ „ „ 2291, „ 25th November „
From „ „ „ 2380, „ 6th December „
To „ „ „ 5576, „ 16th „ „
From „ „ „ 29G, „ 6th January 1870.
From Financial Department, No. 4137, dated 18th October 1869.

From Captain B. Rogers of the Bengal Staff Corps, dated 9th August 1869, submitting a scheme for the destruction of noxious animals.

Home Department Circular, No. 636—47, dated 2nd February 1870, directing the discontinuance of rewards for killing poisonous snakes pending the issue of final orders on the general question.

Home Department Circular, No. 600—609, dated 29th January 1870, calling for reports upon the loss of human life, cattle, and crops from the several kinds of wild animals and venomous snakes for the past three years, and the number of such animals and snakes killed during the same period, and the cost entailed thereby on the State; and requesting Local Governments and Administrations to give their opinion on the scheme submitted by Captain Rogers, and on the system that should be adopted for attaining the object in view, and to state the result of the withdrawal of rewards for killing snakes.

Reply from Madras, No. 137, dated 21st January 1871.
„ „ Bombay, No. 2760, dated 14th November 1870.
„ „ Bengal, Nos. 5512 and 1031, dated 17th December 1870, and 8th March 1871.
„ „ North-Western Provinces, Nos. 174 and 3621, dated 27th May and 18th August 1870.
„ „ Punjab, No. 234, dated 3rd February 1871.
„ „ Oudh, No. 4213, dated 24th August 1870.
„ „ Central Provinces, No. 1259—136, dated 19th May 1870.
„ „ British Burmah, No. 80—38, dated 7th March 1871.
„ „ Mysore and Coorg, No. 2320, dated 23rd July 1870.
„ „ Hyderabad, No. 41, dated 5th July 1870.

Demi-official Note from Captain Rogers, to the Private Secretary to the Viceroy, dated the 25th July 1870, with a letter from Mr. Rowland of Jubbulpore, enquiring whether he could obtain a monopoly for the purchase of the skins of all wild beasts killed throughout India on the terms described in that letter.

Home Department Circular No. 3835—44, dated 19th August 1870, requesting information whether, under the existing system of granting rewards for the destruction of wild animals, the skins of the animals killed become in any case the property of the Government; and, if so, how they are disposed of.

Reply from Madras, No. 137, dated 21st January 1871 (paragraph 8 of Board's Report).
„ „ Bombay, No. 2787, dated 16th November 1870.
„ „ Bengal, No. 5518, dated 17th December 1870.
„ „ North-Western Provinces, No. 1543, dated 30th November 1870.
„ „ Punjab, No. 430, dated 25th February 1871.
„ „ Oudh, No. 4877, dated 30th September 1870.
„ „ Central Provinces, No. 2909—310, dated 11th November 1870.
„ „ British Burmah, No. 80—9, dated 4th November 1870.
„ „ Coorg, No. 383—43, dated 29th August 1870.
„ „ Hyderabad, No. 73, dated 11th November 1870.

RESOLUTION.—The papers now before the Government of India conclusively establish the fact that the evil under consideration is a very serious one. The loss of life, though probably not quite accurately reported, is certainly enormous. Nowhere is the destruction of life by wild beasts so great as in the Lower Provinces of Bengal. In other Provinces, as cultivation and civilization have advanced, wild beasts have diminished in number. In the Punjab and in most parts of the Bombay Presidency, the presence of the more dangerous species is now stated to have become exceedingly rare.

2. In the opinion of the Governor General in Council this serious mortality could be very largely reduced by the extirpation of those animals in the neighbourhood of human habitations. This should be first attempted and every reasonable means taken to secure their destruction whenever they make their appearance near towns or villages. The system of rewards hitherto in force in all Provinces seems to be the most effective means by which the Government can accelerate the work, and Local Governments and Administrations are empowered to increase, within the limits of their respective budget allotments, the rate of the authorized rewards, whenever such a measure is considered desirable; but rewards should only be given for killing destructive and not merely wild animals.

3. As regards snakes, it seems to be overlooked by many officers that there is a deep-rooted prejudice among most natives against killing a snake—a prejudice which nothing but the offer of a reward will overcome. And as deaths from snake-bite are extremely numerous, the Governor General in Council has no doubt that the recent prohibition against the grant of rewards for killing snakes should be partially withdrawn, and that rewards not exceeding two annas a head, as a general rule, should, at the discretion of the Local Governments and Administrations, be offered for snakes known to be deadly, that is, the cobra and some other species to be expressly named. But such rewards should not be offered throughout a whole Province or for an unlimited period, but in selected Districts, where the mortality from snake-bite is greatest, and for a period not exceeding two years. At the end of this period the result of the experiment should be reported to the Government of India, in order that if successful, the propriety of extending it may be considered; and it is clear from the correspondence that care should be taken that no reward be given without the sanke, when killed, being seen by the officer who grants the reward, and that the head of every such snake should be cut off and destroyed as soon as the reward is given.

4. Although it is not desirable to grant a monopoly for the purchase of the skins of the wild animals killed for rewards, or in any way to commence a traffic in them, yet it is proper for the district officers to exercise an effectual check on the disbursement of rewards by subordinate officials, where the work is entrusted to such officials. Whenever *shikarees* are allowed to appropriate the skins of animals, precautions should be taken to prevent the same skins being shewn twice. The correspondence shows the necessity of care in this respect to prevent fraud, especially in the case of animals for which the lower rates of reward are offered.

5. As to Captain Rogers' scheme, it has been generally considered as impracticable; but he deserves thanks for the interest he has taken in the matter.

ORDER.—Ordered, that a copy of this Resolution be forwarded to the several Local Governments and Administrations for information and guidance.

Ordered, that a copy of this Resolution be forwarded to the Financial and Foreign Departments.

Ordered also, that the above Resolution be forwarded to Captain Rogers, with reference to his letter dated the 9th August 1869.

(True Extract.)

E. C. BAYLEY,
Secretary to the Govt. of India.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Reports on the state of the season and prospects of the crops.

GENERAL REMARKS.—On the whole, the latest intelligence received shows an improvement on the state of things portrayed in the reports published a fortnight ago.

In West Berar the timely rain-fall has 'saved the harvest;' in Mysore prospects are 'decidedly' improved; in the North-Western Provinces and Oudh they are not such as to cause anxiety, though in parts injury has been done by excess of rain. Want of rain, on the other hand, has been greatly felt throughout a considerable portion both of the Bombay Presidency and of the Punjab; and the food crops in those tracts will, it is feared, be scanty. The cotton crop in Bombay is, however, promising.

In Bengal, except in the Presidency Division where the inundation has caused much damage both to the *aus* and *aman* rice crops, the loss from floods is not so great as was feared, and no general distress is apprehended.

In the Central Provinces and in Central India the prospects are favourable. In Rajpootana they vary much from State to State according to amount of local rain-fall.

From British Burmah the report is not discouraging.

The latest details are given in full below.

No.	Presidency or Province.	District.	Date of District report.	Rain-fall for fortnight preceding.	Date of message from Local Government or Administration.	State of Agricultural prospects.	Remarks of Local Government or Administration.
	BRITISH BURMA ...	.....	.....	*	September 7 ...	.....	* Rain-fall excessive this year: heavy floods and consequent partial destruction of crops; land being re-sown in some places. Extent of injury cannot be estimated for a few weeks. No fear of famine under any circumstances. Rice cheap.
	BERAR ...	West Berar. Akola ...	Sept. 13 ...	3·	„ 13 ...	Rain just in time to save the harvest. There are prospects now of a middling outturn. More rain is still required to fill the wells and thoroughly saturate the soil.	The rain-fall during the preceding fortnight has been general, but very much less in some places than others. Maximum rain-fall 6·28 inches, minimum 1·84 inches, average 3·74 inches.
		West Berar. Buldana ...	„ 11 ...	3·83	„ ...	Prospects promising, but more rain is wanted.	
	DITTO ...	East Berar ...	„ 14 ...	5·5	„ 14 ...	Rain ample but not superabundant. Cotton and grain crops excellent.	
	MYSORE ...	Bangalore ...	„ 12 ...	2·27	„ 13 ...	Crops generally thriving ...	South-West monsoon still prevails. Rain-fall, though light, has been general. Agricultural prospects decidedly improved within last fortnight.
		Mysore ...	„ ...	2·57	„ ...	Condition of crops improved since last report.	
		Coorg ...	„ 9 ...	7·13	„ ...	Crop prospects favorable.	
	OUDH ...	Lucknow ...	„ 13 ...	2·9	„ 14 ...	Kharif prospects favorable; rabi ploughings vigorously carried on. Heavy rains destroyed sugar-cane in Maliabad Tahsil.	There has been too much rain. Kheree, Fyzabad, Baraitch, and Gonda have suffered most, the latter also from heavy floods of Rapti. In other Districts, codo, juar, makra, jarhan, and sawan, on low lands have suffered. Early rice, kodo, kakun, sawan, urd, makra, and bhadoin are being cut.
		Fyzabad ...	„ ...	9·9	„ ...	Considerable damage by rain to crops in low lands. Rabi ploughings stopped. Break much wanted.	
	NORTH-WESTERN PROVINCES ...	Benares	.....	4·9†			† Heavy showers every day, but their effect modified by sun and wind.
		Allahabad	.....	2·5	„		Prospects generally fair, but injury from excessive rain still complained of.
		Agra	.....	4·	„		In Benares and Agra kharif crops much damaged, and ploughing for rabi crops delayed. In Bareilly and Meerut ploughing going on steadily, but kharif will not be above average.
		Bareilly	.....	2·2	„		
		Meerut	.....	·6	„		
	CENTRAL INDIA ...	Indore ...	September 13 ...	7·01	„ ...	Crops favorable. Wells and tanks nearly full. Prospects for wheat and opium sowing good. Fair weather required to bring on mukka.	Health tolerably good though fever is somewhat prevalent.
		Gwalior	„ ...	4·9	„ ...	Juar crops dwarfed.	
		Western Malwa—Rutlam	„ ...	5·72	„ ...	Agricultural prospects good, but will suffer if rain continues.	
		Neemuch	„ ...	3·01	„ ...	Prospects of crops favorable.	
		Baghelcund Sutna ...	„ ...	4·3			
		Baghelcund Nagode ...	„ ...	7·			
		Baghelcund Sohawul...	„ ...	*	„ ...	Agricultural prospects good.	* Rain heavy; quantity uncertain. General health good.
	PUNJAB ...	Delhi	„ ..	0·6	„ ...	Crops nearly ripe and excellent, except millet which insects have damaged.	
		Umballa	„ ...	0·4	„ ...	Harvest prospects good, but rain wanted.	
		Jullundhur	„ ...	1·0	„ ...	Crops below average; prospects of spring harvest poor.	
		Lahore	„ ...	*Nil.*	„ ...	Unirrigated crops totally lost. Grass for cattle scarce. Bari Doab Canal water only reached Southern part of the District after long stoppage. Inundation canals closed from commencement of present month.	Rain much wanted throughout the greater part of the Province. The out-turn generally on unirrigated high lands will be poor. Agricultural prospects appear best at Delhi and Umballa.
		Mooltan	„ ...	*Nil.*	„ ...	Harvest prospects in Tehsils Mooltan and Serai Sidhee good, except on unirrigated high lands. In Shujabad outturn expected to be one-fourth less than last year. In Mylsie agricultural prospects so far good, but canals have dried, consequently cotton, juar, bajra, and til may suffer.	
		Rawul Pindee ...	„ ...	4·0	„ ...	Agricultural prospects good.	
		Peshawur	„ ...	1·1	„ ...	Kharif outturn expected to be two-thirds of an average one.	
	SIND	... ...	„ 14 ...	†	„ ...	Agricultural prospects excellent. Kharif crops ripening well.	† No rain since last report. Indus now falling; height to-day above datum 14 feet 9 inches. Districts healthy. No cattle disease, but great scarcity of fodder.
	BOMBAY ...	Ahmedabad	„ 13 ...	1·98	„ ...	Prospects good.	
		Dharwar	„ ...	·5	„ ...	The crops had revived from the rain which fell on 28th and 29th ultimo, but are withering again. Rain much wanted. There is but little drainage water in the tanks.	
		Khandeish	„ ...	1·95	„ ...	Prospects bad.	

No.	Presidency or Province.	District.	Date of District reports.	Rain-fall for fortnight preceding.	Date of message from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
	BOMBAY,—*concluded* ...	Poona	Sept. 13 ...	5·27	September 14 ...	.....	In four Western Districts kharif crops generally good, in four Eastern Districts sowing of rabi commenced in few villages. The prospects of the cotton crop in Guzerat are improving and good; in Khandeish favorable, and in Sind. Healthy in all Collectorates, except Hydrabad. Prospects in Sholapore improved since recent rain-fall.
	BENGAL. ...	Patna Division ...	„ ...	...	„ ...	Better reports received from the interior regarding rice crops than were anticipated. No cause of anxiety at present. Some local distress is only apprehended in Sarun.	
		Dacca „ ...	„ ...	3·1	„ ...	Prospects of the crops very good. River is again rising. In Furreedpore sugar-cane crops damaged.	
		Burdwan „ ...	„ ...	*	„ ...	Crops good. Ous much damaged. In Hooghly and Howrah crops in low lands partially destroyed.	* Rain-fall excessive.
		Cuttack „ ...	„ ...	5·2	„ ...	Prospects very good.	
		Bhaugulpore „ ...	... ...	...	„ ...	Prospects of crops generally good, except in Monghyr, where bhadoi has been nearly half destroyed and amun partially injured. Water subsiding at Purneah.	
		Rajshahye „ ...	... ...	...	„ ...	In Moorshedabad river falling fast. A great part of the amun crop destroyed. In Maldah and Pubna also the crop has been much injured.	Prospects generally not so bad as was feared. General distress not apprehended.
		Presidency „ ...	... ...	...	„ ...	Great loss to ous and amun in Jessore, also in Nuddea and in the Busseerhaut Sub-Division, 24-Pergunnahs. The inundations have actually spread over more than half the entire area of Nuddea.	
		Raipore ...	Sept. 9 ...	2·5	„ ...	Prospects of an ordinary kharif harvest more assured. Crops on high lands only somewhat backward, Preparations for rabi sowings advancing. Cattle disease in two Tahsils. Prospects in Bilaspur are good and crops healthy. In Sambalpur rain was much wanted; only ·24 inches having fallen in preceding fortnight, and considerable damage anticipated unless rain fell. The rice crops promise well, but cotton will yield half the average.	
	CENTRAL PROVINCES	Jabalpur	„ 13 ...	4·02	„ ...	Late seasonable showers have dispelled all fears regarding prospects of crops. More than average yield now expected. Rice crops in Mandla greatly improved by recent rains. All other crops excellent.	Agricultural prospects decidedly favorable. Information for Narbada Division will follow.
		Nagpur	„ ...	7·6	„ ...	Kharif corps in good order. Preparation for rabi sowings commenced. Prices of grain falling. In Wurdha rain-fall 2·75 inches. Prospects good.	
		Hoshungabad ...	„ ...	13·50 of which 7·50 fell on the 12th.	„ 15 ...	General prospects good, but cotton, joura, and rice on low lands damaged somewhat by continuous rain.	
		Sirohi	„ 9 ...	·26	„ 14 ...	Prospects very unfavorable.	
		Meywar	„ ...	2·55	„ ...	Rabi crops will probably fail.	
		Deolee	„ 2 ...	·1	„ ...	Prospects good. Preparations for cold weather crops vigorously carried on everywhere.	
		Kota	„ ...	·2	„ ...	Good.	
		Ulwur	„ ...	*	„ ...	Prospects good	* Rain much wanted.
	RAJPOOTANA ...	Marwar	„ ...	...	„ ...	Prospects in some places good, in others apprehension of failure.	
		Ajmere	„ 13 ...	1·8	„ ...	Marwara wants rain. Crops suffering also on North-East frontier.	
		Jeypore	„ 2 ...	†	„ ...	Prospects favorable	† Rain wanted.
		Jeysulmere	„ ...	‡‡‡	„ ...	... ...	‡‡‡ No rain during fortnight.
		Bikanir	„ ...	§§§	„ ...	Prospects unfavorable	§§§ Ditto ditto.
		Bhurtpore	„ 9 ...	·8	„ ...	Prospects very fair. Prices on grain declining.	*General Remarks.*—Kharif crops to East of Arabullee range generally favorable, though rain to fill the *tullaos* much wanted in Meywar and for rabbi sowings; to the West of Arabullee, crops sown after rains in May and June good, those sown later failing for want of rain. In some parts, as Jhalore Parganna and Sirohee, where early rains did not fall, total failure of kharif apprehended.

SUPPLEMENT TO THE GAZETTE OF INDIA, SEPTEMBER 16, 1871. 1259

COTTON.—The prospects of the cotton crop are thus reported on by Mr. H. Rivett-Carnac, Cotton Commissioner in the Central Provinces and the Berars, in a telegram dated Bombay, the 14th instant:

Rain, which returned at the close of last month, has continued generally throughout Western India during the fortnight, and the cotton crop everywhere on this side has generally improved. In West Berar, where rain was most wanted, the rain-fall during the fortnight has been about four inches, and it is raining still. From Guzerat the reports are favorable. Rain has fallen too at Sholapore and Dharwar. At Bellary the reports state that the rain has just saved the crop. The cotton prospects of Western India are thus good. In the North-Western Provinces the cotton suffered somewhat from excessive rain, but is improving.

No. 36 of 1871.

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, SEPTEMBER 23, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

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No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA *is required by Law, of which it has been customary to publish in the* CALCUTTA GAZETTE, *will be included in the* SUPPLEMENT. *For such Orders and Notifications the body of the* GAZETTE *must be looked to.*

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Supply of Sleepers for the Indus Valley Railway.

Extract from the Proceedings of the Government of Bombay in the Revenue Department,—
No. 4105, *dated Bombay Castle, the* 24*th August* 1871.

READ—

Memorandum from the Commissioner in Sind, No. 2222, dated 5th August 1871, submitting reports by Dr. Schlich, Acting Conservator of Forests in Sind, on the supply of sleepers for the Indus Valley Railway, and with certain remarks recommending strongly for sanction a proposal made by Dr. Schlich that a portion of the royalty realized by the sale of sleepers should at once be set aside for re-planting purposes.

RESOLUTION.—Copies of Dr. Schlich's reports are to be submitted to the Government of India for their information.

2. Whatever additional funds may be required for planting purposes should be specified, and provision will be made for them in the next budget, or, if immediately required, special sanction will be asked for.

(True Extract.)

F. S. CHAPMAN,
Chief Secretary to Government.

No. 4106.

SUBMITTED to the Government of India in the Department of Agriculture, Revenue, and Commerce (with copies of Dr. Schlich's reports).

From W. SCHLICH, PH. D., Deputy Conservator of Forests, on special duty in Sind, to the Forest Ranger in Sind,—No. 41, dated Camp Dowlutpoor, the 7th February 1871.

AGREEABLY to the orders of the Commissioner in Sind, I have the honor to submit the following proposals regarding sleeper operations in this Province.

2. Of the forests which are likely to yield Bubbur sleepers, I have up to the present time examined only those situated in Kundiaro and Nowshero Tuppas. Consequently, the following remarks are merely of a preliminary nature, and I shall not be able to submit complete information and proposals until the end of the present working season.

3. The forest tuppas noted above contain an area of 52,159 acres in all, out of which about 4,040 acres are covered with regular Bubbur forest. The remaining area is covered partly with pure Lye forest, partly with mixed forest of Lye, Bahan Kundee, and Bubbur, and partly occupied by cultivation. In the mixed forest, Bubbur is almost always only scattered, and by far the greater portion of it is under middle age.

4. The local demand for Bubbur timber is very insignificant in Middle Sind, and all demands can be satisfied from the mixed forest, leaving the material in the regular Bubbur tracts for export.

5. All Bubbur tracts have been well examined, their approximate area ascertained, and nine forest valuation surveys, extending over an area of 109·11 acres, made. Statement I. attached to this report shows the results. From the figures thus obtained, I have derived the approximate average number of sleepers per acre, and the total number of sleepers, which each tract or Belo may be expected to yield (*vide* Statement II.)

6. The size of the sleepers required for the Indus Valley Railway is 6 feet by 8 inches by 4 inches, and consequently the following number of sleepers can be cut from one log:

Girth of log on its thin end ...	...	3′6″	4′6″	5′6″	6′6″
Number of sleepers ...	...	1	2	3	4

These sleepers will consist, as a rule, of heart wood only, and be perfectly square. Only a very small portion of one edge may in some instances consist of sapwood, owing to irregularities in the stem. Assuming, for safety's sake, that only the trees designated as "good" are fit to yield sleepers, and only one length is cut out of each tree, then we shall be able to cut the following numbers of—

Sleepers ...	In Kundiaro Tuppa	12,768	sleepers
	„ Nowshero „	43,178	„
	Total ...	55,946	„

if all sound trees of 3′6″ girth and upwards are made use of, or—

In Kundiaro Tuppa	8,284	sleepers
„ Nowshero „	31,104	„
Total ...	39,388	„

if only trees of 4′6″ in girth and upwards are to be cut. The particulars are contained in Statement II.

7. The next point to be considered is the cost of the sleepers. Here I am happy to state that I succeeded in making arrangements which, in my opinion, are satisfactory.

8. Hitherto sleeper-cutting in Sind has been done by contractors who entered into an agreement with the Department to deliver at Kotree a certain number of sleepers, to be cut in a certain forest.

9. I have abandoned this system by making directly arrangements with three wood-cutter jemadars—

Hossein, Chanaysur, Cassam } From Dingo near Berya, Nowsheira District.

(who were employed last year by Nubeebux, sleeper contractor of Hydrabad)—to cut and prepare logs for sleepers at the following rates and under the following codditions:

1*st*.—No payment will be made for logs unfit to yield sound sleepers consisting of heart wood.

2*nd*.—Payment to be made for cutting and squaring of logs with the axe for one squared log of—

6′ × 8″ × 4″	=	6 annas.
6′ × 8″ × 8″	=	9 „
6′ × 8″ × 12″	=	11 „
6′ × 8″ × 16″ or 6′ × 12″ × 12″	=	12 „

3*rd*.—Should the Department prefer it, they will cut the logs only and not square them, in which case they will be paid for one log—

6	long by 3′	6″	girth	on	the	small	end	=	4	annas.
6′	„ „ 4′	6″	„	„	„	„	„	=	6	„
6′	„ „ 5′	6″	„	„	„	„	„	=	7	„
6′	„ „ 6′	6″	„	„	„	„	„	=	8	„

4*th*.—Payment to be made once a week.

5*th*.— Each jemadar promises to bring 30 men at least, and he will receive as his pay ¼ anna for every sleeper, turned out, in case they are squared with the axe, and ⅛ anna in case they are squared with the saw.

10. Another arrangement has been made with Dâdoo sawer's jemadar from Ghachero, distant about two miles from Khairodero, to saw the logs prepared in the way described in § 9, and he agrees to do so for 4 annas for each cut all round.

11. From the figures given in the foregoing two paragraphs the cost of cutting and sawing one sleeper will be as follows:

I.—Sleepers squared partly with the axe (on two or three sides), and partly with the saw (on two sides or one side).

Cost of cutting and squaring a log.	Cost of sawing	Total cost.	Per sleeper.
	As.	As.	As.
Yielding 1 sleeper =	6	...	6	6
„ 2 „ =	9	4	13	6½
„ 3 „ =	11	8	19	6⅓
„ 4 „ =	12	16	28	7

Average price, including pay of wood-cutter jemadars, about 7 annas per sleeper.

II.—Sleeper squared with the saw on all four sides.

Cost of cutting a log.	Cost of sawing.	Total cost.	Per sleeper.
	As.	As.	As.
Yielding 1 sleeper =	4	16	20	20
„ 2 „ =	6	20	26	13
„ 3 „ =	7	24	31	10⅓
„ 4 „ =	8	32	40	10

Average per sleeper, including ⅛ anna as pay of wood-cutter jemadars, about 13 annas.

12. The cost of transporting the sleepers to the landing places of boats will be 1 anna per sleeper or under.

13. No definite arrangements have been made as yet regarding the transport to Sukkur or Rohree, but enquiries made by me show that boats can be had at the following rates:

From Mabatdero Belo and Bhawur Belo to Sukkur or Rohree, for Rs. 3-8 per kharar, or under; from Bhortee Belo to Sukkur or Rohree, for Rs. 5-8 per kharar, or under; from Khairodero Belo to Sukkur or Rohree, for Rs. 7 per kharar, or under. One kharar is equal to 24 maunds, and one sleeper weighs 1½ maunds, according to an experiment made by me; consequently, 18 sleepers make one kharar, and the highest rate of freight per sleeper will be—

	Annas.
From Mabatdero to Sukkur or Rohree	= 3·1
„ Bhawur „ „ „ „	= 3·1
„ Bhortee „ „ „ „	= 4·9
„ Khairodero „ „ „ „	= 6·2

or on an average in a round figure, 5 annas per sleeper.

14. To carry out the foregoing operations in a satisfactory manner, the following supervising establishment will be required: one Forest Inspector on Rs. 150 per month; one Moonshee on Rs. 15 per month; two peons on Rs. 7 per month, each. In addition, the officer in charge of Hydrabad Division will have to devote about half of his time to the work, and I think it is not too high to put down three annas per sleeper for supervision and *all general expenses*. It should be remembered that the above-mentioned low prices for cutting and sawing are only available by the department retaining the agency in their hands.

15. The royalty to be charged on these sleepers should, under no circumstances, be less than 8 annas per sleeper. The actual content of one sleeper is 1⅛ cubic feet; but a great deal more will be wasted, and an enormous quantity of firewood will be thrown on our hands, a portion of which, it is feared, will deteriorate before it can be sold either as steamer fuel or to private parties.

16. The total price per sleeper to be charged to the Railway authorities would stand as follows:

	Sleepers squared partly with the axe, and partly with the saw.	Sleepers squared with the saw only.
	Rs. A. P.	Rs. A. P.
Cutting and sawing	0 7 0	0 13 0
Transport to the river	0 1 0	0 1 0
Transport to Rohree or Sukkur	0 5 0	0 5 0
Supervision of operation and general expenses ...	0 3 0	0 3 0
Royalty	0 8 0	0 8 0
Total price per sleeper, Rs. ...	1 8 0	1 14 0

delivered at Sukkur or Rohree. This price I consider to be so low as to exclude all competition from other sources.

17. To enable the Railway authorities to judge of our sleepers, I have prepared two samples, which are now in the hands of the Sehwan Dâk Moonshee, with orders to despatch them by first opportunity to the Sukkur Dâk Moonshee. These two sleepers have been cut out of a log which measured 4′ 6″ in girth on the small end; they have been squared on three sides each with the axe, and on one side each with the saw, and their price would, therefore, be Rs. 1-8 per sleeper.

18. The next point to be considered is the time required for the preparation of the sleepers. If the sawing is done by hand, I shall be able to deliver from Kundiaro and Nowshero Tuppas the following sleepers in round numbers:

On or before	1st July 1871	= 5,000	if arrangements are made at once.
„ „	1st September 1871	= 5,000	
„ „	1st February 1872	= 5,000	
„ „	1st March „	= 5,000	
„ „	1st April „	= 5,000	
„ „	1st May „	= 5,000	
„ „	1st June „	= 5,000	
„ „	1st July „	= 5,000	
	Total ...	40,000	

the number which, in my opinion, should be derived from these forests for the present.

19. Forty-thousand sleepers can be cut and sawed up in Kundiaro and Nowshero Tuppas, within 18 months, without importing any labor into these Districts, or putting up costly machinery. Whether similarly favorable circumstances will be found in the vicinity of the other forests, I am not prepared to say at present; but I think little difficulty will be found in procuring labor, although the price of it may be a little higher. The Chief Engineer of the proposed Railway has put the question, how many sleepers could be supplied annually from the Sind forests; and I think I am entitled to say that, if necessary, more than 100,000 per year could be delivered at Rohree. Whether our forests will be sufficient to yield 600,000 sleepers, the total number required, I cannot state until after the close of the present season; but it appears from all reports that the total number available will not be much less than the figure given above, if at all. The price of the sleepers would differ something according to the distance of the forest from Rohree, and the respective price of labor; but I do not think that this will raise the price by more than 8 annas per sleeper in the most unfavorable case.

20. In continuation of, and in connection with, the foregoing preliminary report, I beg to bring to your special notice the fact that the existence of Khairodero Belo, which comprised 12 months ago an area of 13,073 acres, is on a very doubtful lease indeed. From the sketch map attached you will see that the Indus flows round the Belo on three sides. For some time past erosion has taken place on the Northern boundary as well as on the Southern, and during the last 12 months about 1,900 acres of forest and forest land have disappeared. At present the erosion on the South side has stopped, but it will commence again with the rise of the water. On the North side erosion has never ceased since last year; and unless the current takes a violent sweep towards the opposite side, the river will in all probability eat right through the Belo, and carry away the greater portion or the whole of it.

21. This Belo is estimated to contain the material for 9,690 sleepers, and in my opinion arrangements should be made at once to secure this material. In addition, cutters in large numbers should be set to work to cut all timber in that part of the Belo which is likely to disappear first. The timber, as far as it is not fit for sleepers, should at once be despatched to Kotree Dâk, to be sold by auction or otherwise. The sleeper logs should be squared with the axe and then divided into single sleepers with the saw.

22. The Khairodero Belo is inundated 2 and 3 feet high in the hot season, and I wish particularly to point out that we must set to work at once, if at all this year, and so much the more so, as a sufficient amount of labor is only available up to the end of May, the wood-cutters being all small cultivators. I propose, therefore, that sanction to commence sleeper operations be obtained at once, if such sanction is necessary. In case you charge me with the execution of the work, I should thank you for furnishing me with a draft of Rs. 2,000, on the Mora Treasury in the name of Mr. F. R. Dasai, who would have to remain at Khairodero, and carry out the operations according to my instructions. The above sum, I think, would suffice until the end of March, and the work could then be concluded with funds from the Budget grant of 1871-72.

STATEMENT I.

Showing the results of nine Forest Valuation Surveys made in the Bubbur tracts of Kundiaro and Nowshero Tuppas.

Number of Survey.	Name of Forest tract.	Name of Officer who made the survey.	Number of Bubbur Trees counted. In girth. Under 1'	1'-2'	2'-3'	3'-4' Good.	3'-4' Bad.	3'-4' Total.	4'-5' Good.	4'-5' Bad.	4'-5' Total.	5'-6' Good.	5'-6' Bad.	5'-6' Total.	Above 6' Good.	Above 6' Bad.	Above 6' Total.	Size of Tract Surveyed. Length.	Size of Tract Surveyed. Breadth.	Size of Tract Surveyed. Area in Acres.	Remarks.
	Kundiaro Tuppa.																				
1	Bhawar Belo ...	W. Schlich, Esq. ...	22	29	38	...	...	117	...	...	124	...	...	130	...	...	11	7,100	100	16 30	
	Nowshero Tuppa.																				
2	Bhortee Belo ...	,, ...	...	24	48	...	...	40	...	...	30	...	...	22	...	...	36	5,047	100		
3	,, ...	,, ...	9	33	57	...	...	60	...	...	46	...	...	32	...	...	14	5,356	100		
4	,, ...	,, ...	3	41	123	113	22	135	75	10	85	32	8	40	...	4	16	7,981	100		
	Total		12	98	228	...	...	235	...	...	161	...	...	94	...	...	66	18,334	100	42·09	Middle-aged forest.
5	Khairodero Belo ...	F. R. Dasai, Esq. ...	59	137	131	42	20	62	17	4	21	5	1	6	2	...	2	10,970	100		
6	,, ...	W. Schlich, Esq. ...	65	73	67	28	5	33	13	1	14	5	1	6	...	...	...	3,400	100		
	Total		124	210	198	70	25	95	30	5	35	10	2	12	2	...	2	14,370	100	32·99	Old forest.
7	,, ...	,, ...	4	6	6	17	5	22	14	4	18	5	1	6	2	...	2	2,163	100		
8	,, ...	,, ...	1	1	5	13	2	15	14	3	17	8	2	10	8	...	8	2,472	100		
9	,, ...	,, ...	11	20	51	41	3	44	33	2	35	10	3	13	10	2	12	3,090	100		
	Total		16	27	62	71	10	81	61	9	70	23	6	29	20	2	22	7,725	100	17·73	

(Signed) W. SCHLICH,
Deputy Conservator of Forests, on special duty in Sind.

CAMP DOWLUTPOOR;
The 7th February 1871.

STATEMENT II.

Showing the number of Sleepers available in Kundiaro and Nowshero Tuppas.

Name of Belo.	Area of Bubbur tracts.	Number of sleepers available, if only trees of 4′ 6″ and upwards are to be cut. Per acre.	Number of sleepers available, if only trees of 4′ 6″ and upwards are to be cut. Total.	Number of sleepers available, if trees of 3′ 6″ and upwards are to be cut. Per acre.	Number of sleepers available, if trees of 3′ 6″ and upwards are to be cut. Total.
Kundiaro Tuppa.					
Mabatdero and Bhawar Belo ...	760	10·9	8,284	16·8	12,768
Nowshero Tuppa.					
Bhortee Belo	2,080	11·7	24,336	16·1	33,488
Khairodero Belo, old forest ...	510	10·7	5,457	14·4	7,344
,, middle-aged forest...	690	1·9	1,311	3·4	2,346
	4,040	.....	39,388	.....	55,946

(Signed) W. SCHLICH,
Deputy Conservator of Forests, on special duty in Sind.

CAMP DOWLUTPOOR;
The 7th February 1871.

From W. SCHLICH, Esq., Acting Conservator of Forests in Sind, to the Commissioner in Sind,—No. 242, dated Kurrachee, the 4th July 1871.

I HAVE now the honor to submit to you this report on sleeper operations in Sind, in connection with the proposed line of Railway from Mooltan to Kotree, along the valley of the River Indus.

2. Originally it was my intention to attach this report to the general report on forest administration, respectively.* Working plan of the forests of this Province. This would have delayed its submission, as the preparation of the maps to be appended to the working plan will occupy some time, and as it may become advisable to defer the final drawing up of a working plan, until after the next working season. Under these circumstances, I considered it preferable to draw now up this report, but to give in it only the results of the investigations of the past season, and to refer for the details to the general working plan, to be submited hereafter.

* *Sic* in original.

3. The line of Railway from Mooltan to Kotree will be upwards of 500 miles long, and out of it the section Mooltan-Rohree—a length of about 300 miles—is to be taken in hand for the present. The number of sleepers required for the construction of this line is estimated to amount to 2,000 per mile, including sidings, &c., or some ten lakhs in all. Assuming the line was to be constructed with Bubbur sleepers, the number required annually for repairs would amount to about 100,000, commencing about 10 years after the laying of the line.

4. The first question to be discussed by me will be, whether the forests of Sind are capable of yielding such an amount of material, and in answer to it I regret to state that they, in their present condition, will only be able to yield a portion of it, but that they can be brought into such a state as to produce material sufficient for the maintenance of the line hereafter.

5. The Government forests in Sind comprise an area of 352,041 acres in all, which are distributed as follows:

I.—Shikarpoor Division	...	...	143,214 acres.
II.—Hydrabad „	...	...	121,976 „
III.—Kurrachee „	...	...	86,851 „
Total		...	352,041 acres.

The forests in Shikarpoor Division contain at present no material fit for sleepers, and they may, therefore, be left out of consideration here.

6. The annexed statement shows some condensed results of the examination of the forests in Hydrabad and Kurrachee Divisions, instituted during the past season. The following will be seen from it:

1*st*.—The area of the Bubbur forests is 27,104 acres, or 13 per cent. of the total area.

2*nd*.—Out of all Bubbur forests, 13,935 acres, or about one-half of the whole, are covered with mature Forest.

3*rd*.—The mature forests are capable of yielding at present 464,854 sleepers in all, if the sound trees of 4′ in girth and upwards measured 4′ from the ground, are cut down.

* *Sic* in original.

To this should be added as the result of a preliminary examination of the rate of growth.*

4*th*.—In the Government forests of Sind the average age of a Bubber tree of 4′ in girth, measured 4′ from the ground, is about 35 years, and that of a tree of 6′ in girth about 55 years.

7. In order to prevent any misconception, I shall state here that the tracts classed as mature forest, contain besides trees of 4′ in girth and upwards, great number of trees of less than 4′ in girth. In fact I estimate that not more than one-half of their area is occupied by the mature trees. The proportion of the actual area occupied by trees of 4′ in girth and upwards, to the total area of the Bubbur tracts, must be estimated at one-fourth.

8. The demands for Bubbur timber for local consumption are very limited at present, and they can in almost all instances be satisfied with Bubbur scattered over the mixed forests, so that the timber of the regular Bubbur tracts is available for Railway purposes. The demands for fuel can be met by the material derived from those portions of Bubbur trees which are unfit for sleepers, and by cutting Lye, or tamarisk and other jungle wood. The latter are sufficiently abundant for all demands likely to arise for many years to come, and nothing more about it need be said in this place.

9. If now the terms in which the forests are to be worked, was fixed at 55 years, the average age of a tree of 6′ in girth measured 4′ from the ground, then the mature material at present in the forests will, in a general way, have to be removed within $\frac{55}{4}$, or about 14 years; and the number of sleepers, which can be cut annually without diminishing the growing stock of material, would amount to $\frac{464854}{14}$, or 33,204.

In places where full room for expansion has been given, Babool trees have attained even greater girth than this in 20 years. (Sd.) W. L. M.

10. This number of sleepers is not sufficient to meet the demands of the Railway authorities. Regarding the supply of sleepers hereafter there is no difficulty, because the area of Bubbur forest can be extended to a large extent, by laying out an adequate, but moderate amount of money,—a subject on which I shall fully enter in my report on the working plan.

11. The forests in Meeanee and Sekat Ranges and Oonerpoor Sub-range have to supply Hydrabad and Kotree with material, and no cuttings can be anticipated in them. The Bubbur tracts in Bhoota Sub-range, Rano, Nowshero and Kundiaro Ranges can be deprived of their mature material at any time, because the Bubbur trees in the mixed forest are more than sufficient to meet all local demands for many years to come. Here the cutting of a series of years may be anticipated. The forests South of Kotree, namely Katiar, Kotree, Veeran, Laikpoor, and Soorjanee, have been comparatively little worked hitherto, but it is expected that a brisk trade in firewood with Bombay will now spring up. I should recommend, therefore, that they be not worked beyond their permanent capabilities, the more so, as the transport from these forests to Sukkur will be comparatively high, and their material may be kept back to some extent, to meet the requirement of the section Kotree-Rohree.

12. The number of sleepers available at this present time will, accordingly, stand as follows:

1*st*.—Sleepers derivable from Kundiaro, Nowshero and Rano Ranges, and from Bhooto Sub-range 189,210.	
2*nd*.—Sleepers derivable from Sekat and Meeanee Ranges, and Oonerpoor Sub-range, per year	7,632
3*rd*.—Sleepers derivable from the forests below Kotree, per year ...	12,057
Second and third together ...	19,689

The plan of operations would be to cut annually, in a round number, 20,000 sleepers in the forests mentioned under 2nd and 3rd, and to cut 180,000 in a round number from the Northern forests, whenever they are required.

13. The number of sleepers which can be supplied to the section Rohree-Mooltan from the Sind forests depends on the time within which the line is to be laid down. Assuming the work is to be done within three years, then the Sind forests will be able to contribute 240,000 sleepers; if it is to be done within six years, the number would rise to 300,000, or about half the number required in all, and so on. In this way, our stock of growing material will not be diminished, if the section Rohree-Mooltan is to be completed within 14 years, and it will be decreased by 13,515 sleepers for every year it takes less than 14 years to do the work.

14. In order to prevent not only this falling-off of stock, but also to increase the capability of the forests hereafter, a portion of the royalty realized by the sale of the sleepers should at once be put aside for re-planting purposes.

15. The next point to be considered is the labor question. There is no doubt that all necessary labor for work with the axe can be obtained near to the forests, and many are the applications received by me for contracts for cutting sleepers. Of sawers, also, I trust, a sufficient number will come forward near the forests. Should, however, the Department fail in obtaining them, then the squared logs will have to be boated to Rohree and sawn there, either by hand or machinery.

16. The cost of sleepers consisting of heartwood, partly axed and partly sawn, for cutting, sawing, and transport to Rohree will be as follows:

		Rs.	A.	P.	
1,22,834	sleepers from Kundiaro and Nowshero Ranges ...	1	0	0	per sleeper
66,376	„ „ Rano Range and Bhoota Sub-range...	1	2	0	„ „
7,632	„ per annum from Sekat and Meeanee Ranges and from Oonerpoor Sub-range...	1	4	0	„ „
12,057	„ per year from the forests below Kotree ...	1	8	0	„ „

17. I understand that a quantity of sleepers is being prepared in the Punjab, and the question has been raised by the Inspector General of Forests with the Government of India, as to the point at which Deodur sleepers at Rs. 1-8 each from Lahore down-stream will remain less costly, than Bubbur sleepers, when carried from Rohree up-stream. To answer this question it is necessary to be acquainted with the rate of boat hire in the Punjab, which information is not at my disposal at present, and I can only discuss the above question as far as the Sind end of the Railway is concerned.

18. I believe the intention is to bring the sleepers by water opposite to the different sections of the line, which runs pretty much parallel, first with the Indus, and then with the Panjnud. Assuming the line Rohree-Mooltan be divided into sections of 20 miles each, then the price per sleeper from the Sind forests opposite the beginning of each section would be as follows:

						Rs. A. P.	
First Section of 20 miles from Rohree upwards—					40,000 sleepers from Kundiaro and Nowshero Ranges	1 0 0	per sleeper
Second	ditto	20	ditto	...	40,000 sleepers from ditto	1 1 0	„
Third	ditto	20	ditto	...	40,000 „ „	1 2 0	„
Fourth	ditto	20	ditto	...	2,000 „ Sekat and 38,000 „ Rano and Bhooto ...	1 5 0	„
Fifth	ditto	20	ditto	...	18,000 „ Bhooto and 22,000 „ Sekat, Meeanee, and Oonerpoor ...	1 7 0	„
Sixth	ditto	20	ditto	...	40,000 „ the forests below Kotree	1 13 0	„
					If the construction of the Railway occupies 6 years.		
Seventh	ditto	20	ditto	...	20,000 sleepers from Sekat, Meeanee, and Oonerpoor and 20,000 „ from the forests below Kotree	1 12 0	„
Eighth	ditto	10	ditto	...	20,000 „ „ ...	1 15 0	„
	Total	150			miles with 300,000 sleepers at ...	... 1 6 4	per sleeper on the average.

From this statement it appears that all sleepers, which can be cut for the section Rohree-Mooltan from the Sind forests, will be cheaper than those from the Punjab forests.

19. In the foregoing calculation the royalty has been omitted, which should be added in each instance, in order to get the full price of the sleepers. In my opinion, the royalty should be about ten annas per sleeper, and under no circumstances less than eight annas, out of which sum a certain amount will have to be spent for general supervision.

20. Before concluding this report I wish to point out that several data given in it do not agree with the corresponding figures in my preliminary report No. 41, dated 7th February 1871, forwarded to you with Conservator of Forests' endorsement, No. 73, dated 7th March 1871. The reason for this is self-evident. Since I submitted my preliminary report, I have made some investigations regarding the rate of growth of Bubbur, and the number of sleepers which trees of certain sizes will yield, by cutting down a number of them in the Meeanee Belo. In this way, it has been found that a tree of 4′ to 5′ in girth will yield on an average three sleepers; a tree of 5′ to 6′ in girth will yield on an average five sleepers, and a tree above 6′ in girth nine sleepers. In addition, the estimates of the area of Bubbur tracts in Kundiaro and Nowshero Ranges have undergone some alterations. Hence the differences mentioned above. The above data have been collected in one season, and it cannot be expected that they are more than approximately correct.

21. A sketch map on the scale of 30 miles to the inch has been appended, from which the relative position of the several ranges may be seen.

Statement showing the approximate area of Bubbur Forest in the Government Forests of Hydrabad and Kurrachee Divisions, Sind.

Number.	Name of Forest Range.	Total area of Range, in acres.	Area of Bubbur Forest. Mature Forest. (Per acre.)	Middle-aged Forest. (Per acre.)	Young Forest. (Per acre.)	Total. (Per acre.)	Number of sleepers 6′×8″×4″ in mature Forest. Per acre.	Number of sleepers 6′×8″×4″ in mature Forest. Total.	Area of Bubbur Forest in per cents. of the total area.
	Hydrabad Division.								
1	Kundiaro ...	23,341	953	...	...	953	52	49,556	4
2	Nowshero ...	28,819	2,714	776	299	3,789	27	73,278	13
3	Rano	32,290	772	785	269	1,826	28	21,616	6
4	Sekat	18,772	1,448	1,870	301	3,619	37	53,576	19
5	Meeanee	9,087	1,185	301	275	1,761	26	30,810	19
6	Giddoo Bunder ...	411	...	14	15	29	...	...	7
7	Katiar	9,255	1,439	550	451	2,440	29	41,731	26
	Total ...	1,21,975	8,511	4,296	1,610	14,417	32	2,70,567	12
	Kurrachee Division.								
	Sewan	1,787	...	...	...	...	...	...	
8	Oonerpoor Bhooto Sub-range.	...	1,492	523	304	2,319	30	44,760	
9	Oonerpoor Oonerpoor Sub-range	...	864	727	890	2,481	26	22,464	
	Total ...	20,977	2,356	1,250	1,194	4,800	29	67,224	23
10	Kotree	1,701	275	...	62	337	28	7,700	20
11	Veeran	25,074	1,898	2,465	900	5,263	46	87,308	21
12	Laikpoor	17,620	360	450	366	1,176	40	14,400	7
13	Soorjanee	19,693	535	508	68	1,111	33	17,655	6
		86,852	5,424	4,673	2,590	12,687	36	1,94,287	15
	Grand Total ...	2,08,827	13,935	8,969	4,200	27,104	33	4,64,854	13

* KURRACHEE;
The 4th July 1871.

W. SCHLICH,
Acting Conservator of Forests in Sind.

Statement of Rain-fall and Agricultural Prospects in British Burmah and Sind.

No.	Presidency or Province.	District.	Date of District report.	Rain-fall for fortnight preceding.	Date of message from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
	British Burmah ...	Rangoon	Sept. 16 ...	20·6	September 18 ...	Fair.	
		Akyab	„ ...	10·35	„ ...	Very satisfactory.	
		Maulmein	„ 13 ...	20·05	„ ...	Crops damaged by heavy flood and influx of salt water.	
		Thayetmyo	.....	7·95	„ ...	Prospects fair since damaged by inundation.	
		Tounghoo	.....	6·09	„ ...	Crops somewhat destroyed by inundation.	
	Sind	.....	„ 21 ...	No rain	September 21 ...	Prospects good from irrigated lands. No baranee cultivation. River flood favorable for rubbee crops. In some parts of Upper Sind rubbee acreage submerged by inundation. Slight injury caused to cultivation from high winds. Reports of cotton good.	No rain in Sind this week. Strong winds prevailing. Cattle dying in parts of Lower Sind Districts for want of forage. Some fever prevalent, but general health of population good. Two cases of cholera on board Native vessels arrived at Kurrachee from Persian Gulf. Full precautionary and other measures adopted to segregate persons affected. One case died at sea, the other is doing well.

SALT.

Combined Statement of the quantity of maunds imported, and the amount of duty realized in the whole Bengal Presidency.

Period.	1867-68.						1868-69.						1869-70.						1870-71.						1871-72.					
	Bengal.		Inland Customs.		Total.		Bengal.		Inland Customs.		Total.		Bengal.		Inland Customs.		Total.		Bengal.		Inland Customs.		Total.		Bengal.		Inland Customs.		Total.	
	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.	Quantity.	Duty.
	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.
1st April to 30th April	2,82,778	9,19,028	5,72,419	16,01,075	8,55,197	25,20,103	3,01,622	9,90,021	4,92,915	14,24,917	7,97,537	24,14,938	3,83,175	12,45,319	5,43,879	15,17,314	9,27,054	27,62,633	3,31,131	10,76,176	5,95,971	16,77,565	9,27,102	27,53,741	3,69,345	12,00,371	4,90,748	13,40,508	8,60,093	25,40,879
„ to 31st May	7,35,843	23,91,489	10,94,688	30,16,521	18,30,531	54,08,010	7,26,515	23,61,173	10,16,066	29,18,362	17,42,581	52,79,535	8,76,593	28,48,927	11,31,990	31,59,737	20,08,583	60,08,664	7,60,228	24,70,741	12,36,362	33,89,623	19,96,590	58,60,364	9,30,882	30,25,366	9,72,722	25,70,143	19,03,604	55,95,509
„ to 30th June	13,21,058	42,93,438	14,47,351	39,80,746	27,68,409	82,74,184	12,26,318	39,85,533	13,62,608	38,00,975	25,88,926	77,86,508	13,92,228	45,24,741	15,19,263	42,16,119	29,11,491	87,70,860	13,79,764	44,84,233	16,48,454	44,89,693	30,28,218	89,73,926	16,10,063	52,32,704	12,16,598	32,14,780	28,26,661	84,47,484
„ to 31st July	21,86,944	71,07,568	15,56,067	42,91,265	37,43,011	1,13,98,833	22,08,139	71,76,452	15,94,161	44,61,013	38,02,300	1,16,37,465	23,07,646	74,99,849	16,26,192	45,52,092	39,33,838	1,20,51,941	23,65,301	76,87,228	17,82,150	48,28,936	41,47,451	1,25,16,164	25,68,294	83,46,955	13,76,521	36,79,296	39,44,815	1,20,26,251
„ to 31st August	29,87,948	97,10,831	16,39,083	45,29,862	46,27,031	1,42,40,693	30,94,282	1,00,56,416	17,76,658	50,06,402	48,70,940	1,50,62,818	31,34,504	1,01,87,138	17,42,747	48,93,696	48,77,251	1,50,80,834	32,47,032	1,05,52,851	18,94,211	51,51,847	51,41,243	1,57,04,701	32,95,114	1,07,09,120	15,12,770	41,70,063	48,07,884	1,48,79,183

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

Comparative Abstract of Traffic on Indian Railways for the 1st and 2nd Quarters of 1870-71.

Quarters.	East Indian.				Eastern Bengal.		Calcutta and South-Eastern (State).		Oudh and Rohilkhund.		Punjab and Delhi.		Madras.		Great Southern of India.		Carnatic.		Great Indian Peninsula.		Khamgaon Branch.		Omraottee Branch.	Bombay, Baroda, and Central India.		Sindh.		Total.		Remarks.
	Main Line.		Jubbulpoor Line.																											
	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	
First Quarter.	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£		
Total earnings	718,404	658,700	36,986	40,188	41,869	54,986	2,023	2,774	6,572	6,868	86,271	84,813	127,741	119,924	17,330	16,012	837	728	510,207	526,918	151*a*	951	433*b*	142,436	123,769	19,779	16,504	1,710,606	1,653,568	*a* Receipts for two weeks and four days.
Mean mileage open	1,131	1,279	223	223	113	168	28	28	42	42	530	567	707	805	168	168	19	19	1,063	1,258	7	7	5	312	312	106	106	4,449	4,975	*b* Receipts for six weeks.
Average receipt per week	55,262	50,669	2,845	3,091	3,221	4,230	156	213	505	528	6,636	6,524	9,826	9,225	1,333	1,232	64	56	39,247	40,532	59	73	72	10,957	9,521	1,521	1,270	131,632	127,236	
Average receipt per week per mile open ...	48·8	39·6	12·8	13·9	28·5	27·1	5·6	7·6	12·0	12·6	12·5	11·5	13·9	11·5	7·9	7·3	3·4	3·0	36·9	32·2	8·4	10·4	14·4	35·1	30·5	14·3	12·0	29·6	25·6	
Second Quarter.																														
Total earnings	703,584	576,605	32,143	36,200	39,069	52,[illegible]	1,915	2,352	6,016	7,617	96,905	79,760	125,258	127,392	18,233	17,162	1,150	1,246	541,330	540,198	775	965	680	171,727	162,396	23,741	17,871	1,761,846	1,622,570	
Mean mileage open	1,131	1,279	223	223	113	168	28	28	42	42	554	567	707	832	168	168	19	19	1,184	1,269	7	7	5	312	318	106	106	4,594	5,019	
Average receipt per week	54,122	44,354	2,473	2,785	3,005	4,010	147	181	463	586	7,454	6,135	9,635	9,799	1,403	1,320	88	96	41,641	41,554	60	74	52	13,210	12,492	1,826	1,375	135,527	124,813	
Average receipt per week per mile open ...	47·8	34·7	11·1	12·5	26·5	23·7	5·2	6·5	11·0	14·0	13·5	10·8	13·6	11·8	8·4	7·9	4·6	5·1	35·2	32·7	8·6	10·6	10·4	42·3	39·3	[illegible]	13·0	29·5	24·9	

IRRIGATION OPERATIONS OF FUSL KHURREEF IN THE NORTH-WESTERN PROVINCES UP TO 31st JULY 1871.

CANAL DIVISIONS.	Water Depth in the Canal at Regulating Gauge.		Gross Consumption, cubic feet per second.		Navigation Returns, Ganges Canal. Principal Items of Traffic.							Land irrigated (approximate).		Rain-fall.		REMARKS.
	Full supply, feet.	Actual throughout, feet.	Estimated full discharge.	Actual average throughout.	Nature of Traffic.	Up. Mds.	Up. No.	Down. Mds.	Down. No.	Total Up and Down. Mds.	Total Up and Down. No.	Zillah.	Acres.	Total from 1st April 1871, to 31st July 1871.	Average of ten previous years for the same period.	
Ganges Canal.																
Northern ..	10·00	6·45	710	237	*Grains*—							Saharunpoor ..	25,917	30·8	17·8	GANGES CANAL. The average gauges and discharges have been taken to the 15th only, on which day the canal was closed for the annual repairs; a considerable quantity of drainage-water entered the canal, which had a disturbing effect on the gauges. There was a slight demand for water for rice in the Upper Divisions of the canal, which ceased about the 10th. No demand at all in the Lower Divisions, the expenditure shown in which must have nearly all been discharged in rajbuha escapes. There was heavy and frequent rain all over the canal for the whole month.
Meerut ..	8·10	5·07	1,087	159	Oorud ..	..	..	350	..	350	..	Mozuffernuggur ..	41,011	20·3	14·2	
Futtehgurh ..	6·80	4·00	667	57	Gram ..	350	..	..	..	350	..	Meerut ..	58,125	19·0	16·7	
Boolundshuhur ..	6·35	5·40	933	279	Moong ..	..	..	128	..	128	..	Boolundshuhur ..	29,504	14·2	9·5	
Allygurh ..	5·60	5·20	1,053	..	Wheat ..	..	..	1,653	..	1,653	..	Allygurh ..	41,239	20·4	12·3	
Etawah ..	4·80	3·50	771	114	Total ..	350	..	2,131	..	2,481	..	Muttra ..	5,321	28·2	11·8	
Cawnpoor ..	6·20	5·30	958	522	Cotton ..	..	..	2,388	..	2,388	..	Agra ..	454	24·2	11·1	
					Oil-seeds ..	..	..	109	..	109	..	Etah ..	11,122	16·3	11·7	
					Salt ..	..	..	300	..	300	..	Mynpoorie ..	9,625	23·6	14·7	
					Metals ..	..	..	957	..	957	..	Futtehgurh ..	6,334	23·4	13·9	
					Building materials ..	..	..	6,771	..	6,771	..	Etawah ..	13,461	17·4	12·8	
					Miscellaneous goods ..	323	..	1,767	..	2,090	..	Cawnpoor ..	18,535	17·5	13·0	
					Firewood ..	..	..	9,658	..	9,658	..	Dehra Doon ..	5,116	58·3	30·3	
Total ..	..	..	6,129	1,368	Bamboos ..	..	1,000	..	173,950	..	175,950	Bijnour ..	381	24·8	14·3	
					Tors or Bullees, unsquared timber ..	..	..	..	1,524	..	1,524	Terai ..	2,053	52·8	15·9	
					Kurrees, or squared timber ..	..	48	..	975	..	1,023	Bareilly ..	9,407	39·1	19·7	
Eastern Jumna Canal ..	..	4·50	..	1,041	Logs ..	..	..	..	77	..	77	Jhansie ..	81	19·7	19·2	
Doon Canals ..	..	..	..	142	Miscellaneous timber ..	..	..	..	1,372	..	1,372	Humeerpoor ..	287	22·2	15·8	
Bundelkhund Irrigation Works ..	..	..	..	..	Live-stock ..	..	..	..	80	..	80					
Rohilkhund Canals ..	..	..	..	259	Total ..	673	2,048	24,081	177,978	24,754	180,026					EASTERN JUMNA CANAL. There was a good demand for rice up to the 17th, but none subsequently, and the canal was closed to allow accumulations of drainage-water to be carried off. The rain-fall during the month was considerable.
					Fusl Khurreef 1870-71 to 31st July 1870 ..	..	..	..	..	30,880	14,671	Total ..	277,973	..	..	DOON CANALS. There was a good demand for rice throughout the month. Heavy rain during the month.
					Decrease 1871 ..				..	6,126	..	Fusl Khurreef, 1870-71, to 31st July 1870 ..	298,902	..	..	ROHILKHUND CANALS. Demand slight.
					Increase 1871 ..				..	..	165,355	Decrease, 1871 ..	20,929	..	..	BUNDELKHUND CANALS. No demand.
Grand Total ..	..	..	6,129	2,810												*Traffic Returns*—Were small owing to the low supply during the first half of the month and the closure of the canal from the 15th.

The Terminal Divisions have alternate weeks of high and low supply.

ALLAHABAD;
The 2nd September 1871.

P. S. MARINDIN, *Capt., R. E.,*
Offg. Asst. Secy. to Govt., N. W. P., Irrigation Branch.

GOVERNMENT OF INDIA.

FOREIGN DEPARTMENT.

Extracts from the diary of Mr. R. B. Shaw, Joint Commissioner, on special duty at Ladak, from the 6th to the 12th August 1871.

I RECEIVED a visit from a party of Pathan traders of the Povinda tribe. Most of them are now in Leh for the first time. They state that the condition of Afghanistan and of the countries beyond, with which they have been in the habit of trading, is such as to induce them to look out for other trade openings. Some members of their confraternity, notably one Atta Mahomed Khan, who had before traded to Yarkund, turned their attention this way, and hearing of the new free trade-route, a party of them have come up this year with a few goods to make an experimental visit to Yarkund. Not knowing that this road was so good as it is, they had left their camels in the Punjab and trusted to hired horses; but they declare having seen the road thus far that it is quite passable for camels, and that, if the remaining portion is equally good, and their experimental trade a success, they will, next year, bring up their own animals. Many of their tribe also, they say, will follow their example; in fact, they represent themselves as to some extent a deputation sent up merely as pioneers of the new line. They say that they are much pleased hitherto with the facilities of the route (they have come up through Kooloo and Lahool), freedom of the grazing, and the absence of exactions; but they have considerable difficulty in making carriage arrangements onwards from Leh.

The *karayakash* (or carriage contractors) insist on full payment in advance, in order to pay off their creditors, and are besides disinclined to start before news comes in from Toorkistan. The Povinda traders are anxious to start at once so as to catch the first market, and, with their numbers, laugh at the fears of the *karayakas*; but they object to pay in advance, and besides find it difficult to raise money on their goods in the present state of the currency. Chilkees are valueless at present in the market, and no one will engage to pay in Garbundee silver and gold till the arrival of the kafila.

I have, however, suggested a compromise to both parties, *viz.*, that the *karayakash* shall accept a third of their carriage-money in cash, and the rest in bills payable to their order after the arrival of the Yarkund kafila, and with which they can pay their debts; and I have placed the Povinda traders in communication with a merchant (Tara Sing's agent) who agrees to buy a sufficient quantity of their goods on similar terms, if they can agree as to price. All the parties have consented to the prineiple of the arrangement and are now engaged in settling details.

I have mentioned these particulars both because the circumstances seem to promise the introduction of a new element among the Ladak traders, and also because the facts present a fair sample of the kind of difficulties which now present themselves in this traffic.

To encourage *written* contracts I have proposed to Mr. Drew that we should establish a simple system of registration of documents in the Joint Commissioner's Court. This will give greater security that contracts will be performed, and lead to greater freedom in making payments in advance. Thus the constant contention between the merchant or the buyer who refuses or delays to pay, and the carrier or the seller who refuses to perform his contracts or deliver his goods, will be stopped to some extent.

I may state that Mr. Drew has agreed to establish a Government store, at which supplies of all kinds can be purchased at fixed rate, and for Chilkee rupees.

GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Tuesday, the 5th September 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P. G. M. S. I., *presiding*.
His Honour the Lieutenant-Governor of the Panjáb.
His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.
The Hon'ble John Strachey.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major-General the Hon'ble H. W. Norman, C. B.
The Hon'ble F. R. Cockerell.
The Hon'ble R. E. Egerton.

LOCAL PUBLIC WORKS LOAN BILL.

The Hon'ble MR. STRACHEY moved that the report of the Select Committee on the Bill to facilitate the construction of works of public utility from Local and Municipal Funds be taken into consideration. He said that though the form and arrangement of sections had undergone considerable changes in Committee, the Bill itself remained in all its essential particulars unaltered. There could be no difference of opinion as to the duty of the State to encourage works of utility, sanitation schemes, water-supply, and so forth. For such works loans were often urgently required. At present, however, no municipal bodies throughout the empire, except those on which borrowing powers were conferred by some special Act, had a legal power to borrow, so that, though these bodies had ample means of giving excellent security, they were practically debarred from doing so, and such loans as they did effect were contracted without the authority of law, without any legal security, and consequently on disadvantageous terms. It was undoubtedly desirable that, as a general rule, these bodies should borrow from Government, and not elsewhere; Government being able to lend on cheaper terms than the ordinary capitalist. No risk of public loss would be incurred, as the security would be in every instance thoroughly good. The measure would, he believed, prove of great value in increasing the efficiency of municipalities and promotion of works of public interest.

The Hon'ble SIR R. TEMPLE wished to state that the present measure had the entire concurrence and support of the Financial Department, and that the cause of municipal improvement in India had been promoted by the efforts of his Hon'ble Colleague Mr. John Strachey and also of Colonel Richard Strachey recently a Member of this Legislative Council. It was clear that there must be public improvements, equally clear that these could not be effected without loans, and that it was desirable accordingly to invest public bodies with borrowing powers. The old arrangement prevented municipalities from borrowing, except at various rates, in the open market. The present Bill

would give them the advantage of having the State for a creditor and effecting loans at four and a half to five per cent. rates which, as the Council was aware, could not be elsewhere obtained. The Government of India was always happy to make such advances. The cash balances were high enough to make it easy and safe to do so. No risk of loss to the public would be incurred, but great relief would be afforded to municipalities. It was intended to lend at such rates as would cover any expense incurred by Government in the transaction, and would, in some instances, make a sinking fund possible. He considered that the measure would prove a most useful one, as affording to corporations a comparatively cheap and easy resource for effecting improvements, and this too without imposing even a fraction of burden on the general tax-payer.

The Hon'ble MR. COCKERELL said that with the exception of the municipal corporations of the Presidency Towns, which were specially exempted from the operation of the prohibitory provisions of this Bill, the only municipalities which had borrowing powers expressly conferred by law were those established under the Bengal Local Act III of 1864. As regards these latter municipal bodies, the effect of the prohibitory provisions of the Bill was to suspend for such time as the Government was prepared to make advances to them, the power of issuing debentures which they possessed under the existing law.

He had commented on this matter, as he did not think it was adverted to by his hon'ble friend the mover of the Bill, and silence on the subject might have given rise to the supposition that the general application of the provisions referred to was inadvertent, or that its full effect had not been considered.

As a member of the Select Committee, he (MR. COCKERELL) advocated the course which had been taken in regard to the Bengal municipalities. He believed that their power of raising money on the issue of debentures had been rarely, if at all, exercised, and he felt sure that the bringing of them within the restrictions as well as the privileges of the present measure, was for their real advantage. As had been so forcibly remarked by both the previous speakers, the Government, from its vastly superior credit, was in a position at all times to lend money on far more advantageous terms than those on which it could be obtained from other sources.

The Motion was put and agreed to.

The Hon'ble MR. STRACHEY them moved that the Bill as amended be passed.

The Motion was put and agreed to.

LAND IMPROVEMENT BILL.

The Hon'ble MR. STRACHEY presented the Report of the Select Committee on the Bill to consolidate and amend the law relating to advances of money by the Government for the improvement of land.

LAND REVENUE PROCEDURE (PANJÁB) BILL.

THE Hon'ble MR. STEPHEN in introducing the Bill for consolidating and amending the law as to land-revenue procedure in the Panjáb, and moving that it be referred to a Select Committee, with instructions to report in four weeks, said :

"MY LORD,—I fear that it will be necessary for me to detain your Lordship and the Council for some considerable time in introducing this Bill. If this requires any apology, I must find it in the extreme importance of the subject. In a certain sense, the measure may be regarded as one of the most important

which could come under the notice of the Legislature. Finance is the mainspring of the Government of India, and the land-revenue is the mainspring of Indian finance. I need not enlarge upon this; but I may observe that important as the subject is, it appears not to have received that degree of attention from the persons charged with Indian legislation, which its importance requires.

"To make this plain, it will be necessary to say a few words upon the history of Indian legislation on the subject of the assessment and collection of land-revenue.

"The earliest legislation upon the subject dates from the year 1793, in which, as your Lordship and the Council are aware, the famous permanent settlement of Lord Cornwallis became law. It is not my intention to say anything on the present occasion upon the effect or the policy of the permanent settlement. It was my duty, when at Allahabad, some months ago, to address your Lordship at considerable length on that subject. In connection with the present question, I may, however, observe that it is impossible to read the papers connected with the permanent settlement without perceiving that its provisions were, to a very considerable extent, affected by the conscious ignorance under which its authors laboured as to the nature of the interests in the land which existed around them. They were aware of the fact that interests of a very complicated and peculiar character, unlike anything known to European experience, affected the land of Bengal; and I feel little doubt that one of the objects which they had in view was to effect an arrangement which might be regarded as cutting the knot in which these interests were entangled. Whether, in point of fact, the knot was actually cut, or whether the difficulties were really avoided, is a question on which I shall, on the present occasion, express no opinion. I mention the fact, merely in illustration of the character of the legislation in question, and to explain its effect on the subsequent course of legislation. From the year 1793 to the year 1822, little or no legislation to which I need direct the attention of your Lordship and the Council, took place upon this subject. The permanent settlement was introduced into the Province of Benares, but not into the other Ceded and Conquered Provinces which were afterwards consolidated into what is known to us by the name of the North-Western Provinces.

"In these territories, summary settlements of short duration appear to have been made for a considerable number of years. It was at last determined to reduce the law upon the subject to a regular system. When this determination was taken, the knowledge which Indian Statesmen possessed of the constitution of Hindú society, and in particular of the constitution of village communities, had been very greatly increased. It was under the influence of this knowledge that the famous Regulation No. VII of 1822 became law. It was the work of Mr. Holt Mackenzie, and subject to certain amendments introduced into it by Regulation IX of 1833, it became, and it still is, the foundation of the whole of the law of Northern India upon the subject of land-revenue. It may be said to be based upon a recognition of the fact of the existence of village communities.

"In order to explain what follows, it is necessary for me to make a few remarks upon this famous law. I have read it with attention several times, and it has always reminded me of a remark, which was once made by a judge of great eminence as to a certain paper produced before him, 'Take it away, Sir, and make it much shorter and much fuller.'

"The Regulation begins with a long preamble, which embodies what we should now call a Statement of Objects and Reasons. It deals with many circumstances of local and temporary interest. It enters into minute detail upon a great variety of subjects, but when you come to look at the enacting parts of the Regulation and to subject its general expressions to the ordinary tests of

legal criticism, it is almost impossible to say with any degree of precision, precisely what it means to enact and what it leaves unenacted. It unites, but does not very clearly distinguish, two main objects—*first*, the object of making provision regarding the assessment of the revenue, and *secondly*, the object of instituting a sort of system of registration which has become well known under the name of the 'Record of Rights.' This second part of the Regulation is, when closely examined, singularly vague, and in particular, it leaves practically undetermined the vital question: What is to be the legal effect of the system of registration thus established?

"I may illustrate the great obscurity of this famous Regulation by reading, with your Lordship's permission, one or two passages from a work from which much information is to be derived about Indian affairs, though it is conveyed in an exaggerated and vehement shape, and is deeply coloured by the strong opinions of its author. I refer to Shore's notes upon Indian affairs. That author describes the Regulation as follows:—'First, for the far-famed Regulation VII of 1822, whose mazes and intricacies have so bewildered the intellects of those Collectors who have attempted to put them in practice. Every extraordinary production of this nature has generally some primary moving principle, or mainspring, which, when divested of its outworks or external causes, will give us some insight into the nature of the effects it is intended to produce. The Regulation in question was the work of a very clever man, who was mainly guided by theory, but who was unfortunately deficient in that local knowledge and matter-of-fact experience, without which the fairest theories have failed. * * * * * * This famous Regulation is, in fact, a provision for introducing into the country a ryotwarree settlement, and a ryotwarree settlement is, when divested of its mystification, simply a plan to get rid of the principal farmers of the different estates, and by making those settlements directly with the subordinate owners and cultivators, to realize to the Government the share which the principal farmer formerly received.' Elsewhere, he says of the same Regulation, that its 'fundamental principle is to destroy whatever good did exist under the ancient customs of the people without supplying its place with anything else, and in order to raise a still higher revenue for the Government. I repeat, again, the principle of it is to get rid of the manager of the estate and head of the farm, and assess each portion separately, by which proceeding Government hopes to realize his share for itself.' I think that this is unjust to Mr. Holt Mackenzie. It appears to me perfectly clear, on reading the Regulation, that its principal object was to protect subordinate rights, instead of making the zamíndar the absolute owner of the soil, as he became in Bengal, under the provisions of the permanent settlement; but the fact that the Regulation admitted of such a construction is sufficient proof of its extreme obscurity. This is further shewn by the amendments which were made in it by Regulation IX of 1833. The most important of these amendments, was that the Regulation was not to be considered to mean that the record of rights and the assessment of the land-revenue should take place at the same time. It is obvious enough that if this had been the law, the making of settlements would have been indefinitely prolonged. Whether this arrangement was, or was not intended by Regulation VII of 1822, is, perhaps, open to question; but the fact that such a question should have arisen respecting it, is an additional proof, if any such proof is required, of the extreme obscurity of the Regulation itself.

The system established by Regulation VII of 1822, was in subsequent years very considerably modified by certain instructions issued to Settlement Officers and Collectors of Revenue by the authorities of the North-Western Provinces. After some changes, these instructions were consolidated into two books, the directions to Settlement Officers, and the directions to Collectors. The author of these works was, I believe, the late Mr. Thomason, and I may observe in passing, that of all the law books that have come under my notice, I should be inclined to say that they are very nearly, if not quite, the best.

"With some exceptions, to which I need not now refer, they are arranged and expressed with a degree of precision and clearness, which I do not think can well be exceeded. They were not, however, law, but merely commentaries upon the law.

"I have noticed that there is an all but insuperable tendency amongst persons who have to acquaint themselves with the law, to prefer hand-books to Acts. This probably arises from the fact, that Acts whether passed by Parliament or by local Legislatures, have usually, till very recently, been drawn in a form as difficult, cumbrous, verbose, and repulsive as the perverted ingenuity of draftsmen could devise. The old Bengal Regulations were, I think, better drawn than contemporary Acts of Parliament; but that is about the only praise that can be bestowed upon their drafting, and it is not high praise. The hand-books drawn up by Mr. Thomason were infinitely superior to the Acts which they were intended to explain, and the natural consequence was that they superseded them.

"In the year 1849, the Panjáb was conquered and annexed, and the system which then prevailed in the North-Western Provinces was introduced into the Panjáb in a manner to which I will now proceed to direct your Lordship's attention.

"The Province was placed, as you are aware, under a Board of Administration consisting of Lord Lawrence, his brother, afterwards Sir Henry Lawrence, and Mr. Mansel. Their powers were defined in a despatch from the Government of India, dated the 31st March 1849. I have not the least doubt that the intention of those who drew up that despatch was to say to the Board of Administration—'Govern these Provinces as well as you can and according to your own discretion, and take for your guide, generally speaking, the system already established by law in the North-Western Provinces.' This, however, was not precisely what they did actually say. Part of the despatch to which I have referred is in these words: 'The Governor General would wish to uphold Native institutions and practices, as far as they are consistent with the distribution of justice to all classes; but he is persuaded that except in some of the wild districts of the Trans-Indus, or the Alpine country of the Sind Saugor Doab, there is no portion of the country which will not be benefited by the gradual introduction of the British system, at the earliest possible period.

* * * * With the knowledge now generally prevalent respecting village co-parcenaries, there is no apprehension that our officers will not exert themselves to maintain those important bodies in all their integrity.

* * * * The popular institutions will be improved and consolidated by our measures, and the native system of accounts and reports will be adhered to without any great or radical deviation.'

"In another part of the despatch, the following passage occurs: 'The four short printed circulars of the Sudder Board of Revenue of the North-Western Provinces, and the pamphlets published under the orders of the Lieutenant-Governor, form an admirable body of instructions, adapted to any Province where the village system obtains, and explain so lucidly the structural and functional divisions of our complicated revenue machinery, that they should be largely indented for and circulated amongst our officers.'

"Under these instructions, the Board of Administration conducted the government of the country. It would be an impertinence in me to venture to praise the manner in which they did their duty. The success of the Administration of the Panjáb by Lord Lawrence and his colleagues must always form one of the brightest of the many bright pages in the History of British Rule in India. I may, however, observe that good as was the work done, it was performed with singularly blunt tools. So long as the government of the country was substantially a matter of military occupation and personal discretion, questions as to the precise

meaning of the instructions, under which the Board of Administration acted, did not, and indeed, could not, arise before Courts of Justice. This, however, was a state of things which could not last. The very object for the attainment of which Lord Lawrence and his colleagues laboured was the introduction of a regular legal system of Government; and when Courts of Justice were established, and questions of right arose before them, it became obvious enough that the instructions originally given to the Board of Administration were vague in the extreme, and left open innumerable doors to questions affecting the whole administration and government of the country. A somewhat singular incident invested these matters with peculiar importance. The theory upon which conquered Provinces had long been administered by the Governor General in Council was that the Government of India possessed, as Agents for the Queen of England, the right, which Her Majesty undoubtedly possesses, of legislating for conquered territories. They treated, in short, conquered Provinces as being, what in English law would be described, as 'Crown Colonies.' Whether the constitution of the East India Company, and the various Acts of Parliament which had been passed with relation to the Government of India, justified them in this view, is a question upon which a good deal might be said, if the discussion were now of any practical importance. I refer to it only for the purpose of explaining the course of legislation. My distinguished predecessor, Sir Barnes Peacock, wrote a minute upon this subject, in which he expressed his opinion that the Government had no right to make laws for the Non-Regulation Provinces by a mere executive order, or in any other manner than by laws duly made in the Council of the Governor General assembled for that purpose, under the provisions of the Acts of Parliament which were then in force.

"The effect of this opinion was to render it altogether doubtful, whether or no, any law at all could be said to exist in the Panjáb, and whether the whole government of that country under the Board of Administration had not been one continuous series of illegal acts. The attention of Government was at that time engrossed by other matters. It was considered, and I have no doubt rightly considered, practically impossible to enact a special Code of Laws for the Panjáb. It would have been equally, if not more objectionable, to extend to the Panjáb, in the mass, the Regulations and Acts which had been passed for the government of other parts of India. Under these circumstances, the course actually taken was to introduce into the Indian Councils' Act in the year 1861, a provision to the effect that all laws, orders, and regulations hitherto made for the government of the Non-Regulation Provinces, should be confirmed.

"This enactment has, since that time, been regarded by the Government of India as a declaration by the Legislature that the Government possesses no other legislative powers in the Non-Regulation Provinces than it possesses in other parts of the country. This was one effect of the enactment in question—another effect of it was to stereotype the existing orders and regulations of the Government, and to give to them a degree of legal importance which they most certainly were never intended to have. It was enacted that existing orders and regulations should have the force of law, and lawyers were set to put a legal construction upon the despatches and correspondence which constituted these orders and regulations.

"It became at once apparent, as indeed it is apparent upon the most cursory inspection, that they left open questions of the very utmost importance.

"Take for instance this question: Does Regulation VII of 1822 extend, or does it not extend, to the Panjáb? The despatch to which I have already referred says that the 'Governor General would wish to uphold Native institutions and practices as far as they are consistent with the distribution of justice to all classes.' Now, the Regulation in question was obviously drawn with reference to the existence of a set of Native institutions and practices

which differed in many important respects from those which prevailed in the Panjáb. Regarding this despatch as a law, which is to prevail—the practices and the institutions on the one hand, or the words of the Regulation on the other? Again, the despatch says, that 'there is no apprehension that our officers will not exert themselves to maintain village co-parcenaries in all their integrity.' The effect of the provisions of Regulation VII of 1822, if introduced into the Panjáb, would certainly be to render possible the destruction of these village communities. Did the despatch in question introduce these provisions, or did it not?

"I believe I have the authority of Sir Richard Temple, who having been Secretary to the Panjáb Government in Lord Lawrence's time, is better qualified than most persons to offer an opinion on this subject, for the assertion that Lord Lawrence and the Board of Administration never believed that it was the intention of the Government to introduce the Regulation in question in its entirety into the Panjáb. They considered—and it appears to me that there can be no doubt that they were right in considering—that their instructions were to take this Regulation as a general guide, but not to consider themselves bound by all its provisions in detail. The Chief Court of the Panjáb, on the other hand, when the question arose about three years ago, decided distinctly and recorded their decision in a minute which they wrote upon the subject, that Regulation VII of 1822 was in force in the Panjáb. I may remark that the whole of the violent, most acrimonious and unfortunate discussion which occupied the attention of Government upon the subject of Panjáb tenancy in 1868, arose out of this question.

"I may mention one further fact upon this matter. Mr. Robert Cust prepared a hand-book of revenue law for the Panjáb. This was issued to the various revenue officers; and questions might easily be raised as to the extent to which the contents of that book could be regarded as law. They differed in several respects both from Regulation VII of 1822 and from the instructions to settlement officers which were issued to explain it. Here, therefore, is a fresh source of difficulty upon this subject.

"Such, stated shortly, is the actual condition of the law relating to land-revenue in the Panjáb. The extremely unsatisfactory condition in which it stands has long been notorious, and, having been brought to the attention of the Secretary of State some time ago, Mr. Robert Cust received instructions to draw up a revenue code for Northern India. This work he accordingly undertook, and, about a year since, his draft was forwarded to the Government of India for their consideration in the Legislative Department. Our simplest course in some ways might have been to accept and to adopt Mr. Cust's draft code, but reasons, which I will now proceed to state in general terms, led us to the conclusion that this would be inexpedient. Mr. Cust's work, which I hold in my hand, has, beyond all question, very great merits. His great experience and industry no doubt enabled him to collect together all that was to be said on the subject, and I think we may feel pretty confident that, if we succeed in extracting from Mr. Cust's draft all its material parts, we have omitted nothing essential to the completeness of the system.

"I will read a few lines from some observations which he has appended to the code itself, in order to confirm what I have already said in regard to the existing state of confusion in the law upon these matters: 'The law relating to the collection of land-revenue still remains in a state of lamentable and, except to those who are trained to its study, unintelligible confusion. Regulation upon Regulation, Act upon Act have been passed upon this most important subject between the year 1793 and the present time, rescinding parts or whole, modifying, contradicting, or reiterating. It has come to this in Northern India that no one pretends to study the law on the subject, but each man contents himself with the knowledge of the text-books and circulars of the executive authorities.'

"This description, I believe, to be perfectly correct.

"I will now say a very few words on the reasons which have led us to the conclusion that it would be practically impossible to accept and enact into law Mr. Cust's draft.

"It contains 1,281 sections and fills no less than 216 quarto pages printed in somewhat small type. A very large—I may say, indeed, by much the largest—part of it consists of matter which it is altogether unnecessary, and much of which it would, in my opinion, be dangerous to put into the form of express law. Great masses of it are of the nature of mere executive orders, and enter, as it seems to me, into altogether needless detail. There is, for example, a section—chapter IV, section 25—which provides for discipline as follows: 'Discipline shall be enforced in the following manner: *A*. Reproof by word of mouth, or letter,' and then follow six other forms of administering discipline amongst revenue officials lettered up to '*G*.' It contains elsewhere an enactment that Collectors are to maintain rain gauges in order to ascertain the amount of the annual rain-fall. I have no doubt that the rule is an excellent one, but it is one for which no law can possibly be needed. The effect of regulating matters so very minutely by express law would be to deprive the officers of the administration of all personal discretion, and to encumber them with a mass of intricate rules which it would be utterly impossible either to remember or to understand. In addition, however, to this, it must be observed that Mr. Cust's draft contains a very great number of declarations of policy on the part of the Government. For instance, section 55 of Chapter III is in these words: 'It is declared to be the policy of the State, not to retain property in land, but in all cases to recognize and fortify indications of private property whether undeveloped or partially obsolete, and, where absolutely non-existent, to create such property by grant to the person best qualified to make a good use of the land, and expand the resources of the Province.' It appears to me that it would be on every account most undesirable to insert into a law matter of this description. Mr Cust's code contains, moreover, a large number of provisions which lay down the principles, so to speak, of a system of real property law, and, in particular, it defines in many sections of very considerable length the different kinds of interests which may exist in the land and its produce. It also lays down the rights of the State to land. I think that it would be more bold than wise to undertake, in the present state of our knowledge of local customs and institutions, to lay down principles so wide and to invite such numerous and difficult controversies as would, beyond all doubt, be involved in their announcement.

"I may add that the draft code in question is intended to apply to the whole of Northern India, including the North-Western Provinces, the Panjáb, Oudo, and the Central Provinces. The circumstances of these various Provinces differ in many important respects, and, as I have already shown, the existing provisions of the law in force in them are by no means identical.

"It seems to me, therefore, that it is not a wise course to attempt to have a single code for the whole of Northern India, but that it would be far better to have separate Acts for each Province, embodying their peculiar characteristics and providing for their various wants.

"Mr. Cust himself appears to have felt this, for the sixth section of his code, with reference to the peculiar circumstances of any Province in which this code may come into operation, enables 'the Government of India, on the motion of the Local Government, to intercalate into this code, additional sections and chapters which shall apply solely to such portions of the provinces, and suspend such portions of certain sections and chapters of this code, in such portions of the province, and to modify and rescind such intercalations and suspensions from time to time, so as to bring the law into

harmony with the diverse and changing requirements of each province, and yet preserve the symmetry of the code.' The effect of such a provision as this would be to destroy the value of the code entirely. The Government might alter it as they pleased, not only for every Province, but for every part of every Province; but all our experience shews that, in a very short time, a jumble of rules, circulars, and executive orders, having reference to various districts, or divisions, or provinces, would grow up which would render the new code ten times more difficult to understand than the existing system which it is intended to replace. For all these reasons we felt that it would be impossible to accept Mr. Cust's draft.

"We also felt that the opportunity for legislating for the Panjáb, afforded by our peculiar position during the present season, was one which ought to be seized, as it might not easily recur. We have been so fortunate as to have sitting in Council the Lieutenant-Governor of the Panjáb, my hon'ble friends Mr. Egerton, the Financial Commissioner, and Sir Richard Temple, whose early connection with the Province is so well known. Under these circumstances, it seemed to me that we might, during the present summer, prepare a Code of Revenue Procedure, which, though intended primarily for the Panjáb, might, if it were found successful and thought desirable, be readily adapted to the wants of other parts of Northern India. This Bill has accordingly been prepared; and in moving that it be referred to a Committee with instructions to report in four weeks, I wish to direct particular attention to the fact, that although the time may appear short, the measure has in reality been most maturely considered and not hurried in the slightest degree. The Bill has been drafted, I may say, under the superintendence of, and in daily concert with, the revenue authorities of the Province, and I trust that the effect of their advice and instructions upon the subject has been, that the Committee will be perfectly able to dispose of the measure within the time which I have mentioned.

"Before I enter upon the provisions of the Bill, I will say a few words upon the authorities from which it has been framed. In the first place, I consulted Mr. Cust's draft. In the next place, I carefully examined the sixty-five regulations which are supposed to have been introduced into the Panjáb by the despatch to which I have already referred, and of which my hon'ble friend Mr. Cockerell was good enough to supply me with a complete list. I have also consulted Mr. Thomason's instructions to Settlement Officers and to Collectors, and the whole work has, as I have said, been carried on under the eye of the Lieutenant-Governor and the Financial Commissioner of the Province. I hope, therefore, that the Bill will be found to be moderately complete. I may say a few words upon the sixty-five regulations to which I have referred. The list of them looks extremely formidable; but when the matter is closely examined, they turn out to be a mere ghost, dressed up as it were in a white sheet. Some of these regulations re-enact others, some extend regulations already enacted to particular districts, which had then been recently conquered. Many of them refer to particular transactions long since past. Many others vary the procedure of the Courts in some insignificant detail; and, in fact, after fully examining and looking into every one of the sixty-five regulations in question, I arrived at the conclusion that Regulation VII of 1822 and Regulation IX of 1833 are the only ones relating to the subject which are of any serious importance. The matter, therefore, is not in reality by any means so difficult as at first sight it appears to be. The Bill, as drawn, will replace the whole of the existing Bengal Regulations upon the subject, and will condense into about eighty sections the 1,281, which have been drawn by Mr. Cust. I have said that it does not alter the existing law, but it fills up certain gaps which are left by the existing law, and it settles certain points which have been much discussed in connection with its provisions. It does not interfere in any degree with the

Panjáb Tenancy Act of 1868, which regulates the rights of the parties interested in the land, as between each other. Neither does it interfere with section twenty-one of the Panjáb Courts' Act of 1865, which empowers the Local Government, whenever a settlement is in progress, to invest the settlement officers with whatever judicial powers they think fit in relation to suits connected with the land.

"After this long and, I fear, tedious preface, I come to state in general terms the provisions of the Bill, which I have now the honour to introduce.

"The natural division of the subject is as follows:

I.—Officers.
II.—Settlement.
III.—Collection of Revenue.
IV.—Miscellaneous.

"On the subject of Revenue Officers little need be said. It is proposed merely to enact in very general terms the system as it exists.

"A settlement includes two great operations,—the assessment of the revenue, and the formation of a record of rights.

"The assessment includes also two operations,—the determination of the amount of the revenue which is to be paid in respect of particular pieces of land, and the making an engagement with the person whom the Government permits to be answerable for the payment of that revenue.

"The record of rights must be considered with reference to three operations,—*first*, its formation; *secondly*, keeping it up; and *thirdly*, its revision.

"Further, it is formed *first*, by judicial decisions; *secondly*, by statements of individual rights and statements as to matters of fact recorded by the settlement officers. It is composed of the following documents,—*first*, measurement papers, one of which is an index map, showing all the fields in each village in which the settlement is to be made; *secondly*, what is called the *khuteonee*. This is a list of the occupiers and owners, and a specification referring to the index map of the lands occupied and owned by them. *Thirdly*, a tender on behalf of the persons with whom the settlement is to be made to take the land for a certain time at a certain rate of revenue. *Fourthly*, the *khewut*, which, as I understand it, is a paper showing the shares in which the land is held and the persons who hold land-revenue free, and showing also the shares of revenue for which each holder is liable as amongst themselves, although there is also a joint and separate liability on every member of the village for the whole revenue due from it. *Fifthly*, the *wajib-ul-urz*, which is a record of the village customs, and forms a sort of village manual of real property law. *Sixthly*, what is called the final *rubikaree*, which is a record of the whole history of the settlement, and contains, amongst other things, a list of all law suits which have taken place before the settlement officers. These documents taken together form a record of rights; and I may observe first that, in enacting that the record of rights shall contain these documents, we merely give the force of law to an arrangement which has been found by experience to be convenient. The documents which I have mentioned are well understood by every settlement officer, and are prepared on every settlement with the greatest possible degree of care and precision. I am told that the practice with regard to some of them is, to cause all the landowners in the village to sign them, and to append to them a note of the absence of those who, for any reason, are unable to sign. Such are the operations of a settlement. But I must observe that settlements themselves are of four different kinds, and that these operations are performed in different ways, and under different circumstances, according to the nature of the settlement of which they are to form a part. A settlement may be, *first*, a summary settlement, that is to say, a settlement in which no record of rights is formed, but

the engagements for the revenue assessed are taken from the parties in possession. *Secondly*, a first regular settlement. A first regular settlement is a settlement in which a complete record of rights is made for the first time, and in which engagements for the amount of revenue assessed are taken from the persons who, according to the principles of settlement law, are held to be entitled to make such engagements. *Thirdly*, a re-settlement. This occurs, when, upon the expiration of the term of the first regular settlement, the amount of revenue is re-assessed, and the record of rights revised to a greater or less extent, according to circumstances. *Fourthly*, there may be a revision of the record of rights without any alteration in the revenue.

"Now, such being the operations which take place at a settlement, and such being the kind of settlements at which these operations are performed, I proceed to notice what I think ought to be one of the main features of this Act—a feature which is intended to remedy one of the principal gaps left open, by Regulation VII of 1822.

"That Regulation nowhere expressly decides what is to be the precise legal effect of the entries made in the record of rights. We propose that that effect should be as follows: All entries made in consequence of judicial decisions should have the effect of other judicial decisions. All entries made, as to matters of fact or matters of individual right, are to be presumed to be true in all cases, and as against persons who have the opportunity of dissent when they are made, are to become conclusive after five years.

"These are the general principles which we propose to lay down with regard to settlements.

"I now pass to the manner in which they are to be applied to the settlement of particular districts, and we propose that when a particular district is to be settled, the Local Government should, with the previous sanction of the Government of India, issue a notification which would bear to the Act that I am now introducing, the same sort of relation, that a special Act, about a particular railway, bears to the Acts of Parliament, well known to your Lordship, as the Land Clauses Act, or the Railway Clauses Act.

"The notification will state specifically the district under settlement, the nature of the settlement proposed to be made—as it falls under one or other of the four heads to which I have referred—the judicial powers, if any, with which the settlement officers are to be invested; the details, if it is thought desirable to specify any details, with regard to the record of rights, and in the case of a re-settlement or a revision of a record of rights, the particulars as to which any existing record of rights is to be subjected to revision. It is, however, provided that no entry affecting any proprietary or other right shall be altered except by the consent of the parties or after a judicial proceeding. The effect of this will be, that the settlement officer will know precisely what he is to do, and the Courts of Justice will know precisely afterwards what he actually has done.

"Such is the machinery by which we propose that settlements should be made. I may pass shortly over the other provisions connected with them. We propose to determine in terms nearly resembling those of Regulation VII of 1822, though not identical with them, with whom the settlement is to be made. We further propose to lay down provisions for handing over the record of rights, when completed, from the settlement officer to the Deputy Commissioner, in whose charge it will be kept, and the Local Government will lay down rules by which the necessary alterations caused by death, sale, or decrees of Court, may, from time to time, be made in it by the person who has charge of it.

"This concludes what I have to say as to the provisions of the Act as to making settlements.

"The next subject with which it deals is that of the collection of revenue. It is very difficult to say what the existing law upon this subject is. I believe that sales for arrears of revenue are practically unknown in the Panjáb. Whether they are legal or not, is a question on which I can imagine a dispute being raised in consequence of the terms of the despatch to which I have already referred. It is at all events perfectly clear that whether legal or not, they ought to be introduced. They are the *ultima ratio* for the collection of revenue; and, though the power should be exercised in the most sparing manner and with the greatest possible caution, it seems to those who are the highest authorities on the subject, that it is one which cannot be dispensed with.

"I may say a few words upon the subject of these revenue sales. The practice, I believe, was entirely unknown to the Native Governments, although the process of forfeiture was not unknown to the Síkhs in the Panjáb. They were introduced into Bengal shortly after the permanent settlement, and, in that part of the country, if a person did not pay his revenue to the day, subordinate revenue officers had a right, which was most freely exercised, of bringing his land to the hammer immediately. From Bengal the practice passed into the North-Western Provinces. It excited, as I have been told, the greatest indignation, and the worst possible feeling on the part of the natives, and I have frequently heard it asserted that, during the mutinies of 1857, the only popular movements which took place at all in the North-West, were movements for the purpose of taking possession of lands which had been sold either for arrears of revenue or under decrees of Court. The evils which this state of things produced were keenly felt; and, in order to avoid them, a device was resorted to, which has frequently been tried in England, but which, I am inclined to think, proceeds upon altogether a wrong principle. Sales were maintained, but they were surrounded with a variety of formalities which made it exceedingly difficult for the Collector to sell without falling into some error which would vitiate his proceedings.

"This is, in principle, very like the practice that obtained in England, of attempting to mitigate the extreme severity of the old criminal law, as it originally stood, by excessive scrupulosity in regard to indictments. You might hang a man for stealing five shillings, on condition that you drew up your indictment in such terms that the most astute lawyer could not pick a hole in it. I do not think this system of trumping tyranny, by quibbles and nibbling at a law, which you do not choose either to repeal or to enforce, can ever be a good one. Legal procedure ought in all cases to be clear, short, and decisive. If there is a danger that it may be used oppressively, the proper remedy is to require that it should not be put in force at all without the sanction of those who are not likely to abuse it. We propose accordingly that no sale of lands for arrears of revenue shall be valid without the previous sanction of the Lieutenant-Governor of the Province.

"This is the real security against abuse; and I sincerely hope that, as it never has as yet been found necessary to sell land in the Panjáb for arrears of revenue, it never may be found necessary in the future. It will be for the consideration of the Committee, whether, having regard to this sanction for sales, it may not be possible to simplify the present procedure in respect to them.

"I need not detain the Council with many words upon the miscellaneous provisions of this Bill.

"They refer to certain duties which are thrown upon revenue officers, and which have no relation to the general subject of the assessment or collection of the revenue. I may pass them over with this observation. As I have already remarked, the land-revenue system of the Panjáb, though not identical with, is very similar to, the land-revenue system of the North-Western Provinces.

"I trust that this Bill may be considered by the North-Western Provinces Government, and that, if that Government think it can be adapted to the purposes and wants of those provinces, it will make such suggestions to us on the subject as it may think desirable."

His Honour the LIEUTENANT-GOVERNOR of the Panjáb said that, after the elaborate statement just made by the Hon'ble Mr. Stephen, it was unnecessary for him to do more than express the entire concurrence of the Panjáb Government in the views expressed and in the policy of the proposed measure. Mr. Stephen's explanation would show that the task which he had undertaken was no easy one. The law now about to be superseded was about fifty years old, and, within a few years of its enactment, its imperfections had begun to be perceived and criticized. No one, however, had hitherto undertaken its reform; the consequence had been great indistinctness, frequent mistakes, and no small public inconvenience. The Panjáb would, His Honour was sure, not be slow to recognize the advantages of such a Bill as the one now introduced, and, should it be passed, it would, he believed, be amongst the enactments most creditable to the energy and skill of His Excellency's administration.

The Hon'ble SIR R. TEMPLE said—"I have but one remark to make in corroboration of what has fallen from my hon'ble colleague, Mr. Stephen, regarding the introduction, or rather the non-introduction of Regulation VII of 1822, into the Panjáb. I, for one, share his belief that this Regulation was never formally introduced into the Province. What was done at the outset, was to introduce in the most general terms the North-West system. That system embraced the main substance of that Regulation, but nothing further. It was also a common instruction in those days to act in the spirit of the Regulations. Thereby it was meant to leave a wide margin, within which that Regulation might be modified by executive authority from time to time. As for any particular section, or clause of that Regulation being adduced to check or to contravene the proceedings of the executive, no such idea was present to the minds of those who founded the administration of the Panjáb.

"I have one thing more to say, which is to express my satisfaction at the honourable tribute which Mr. Stephen has paid on this, as on a former occasion, to the memory of Mr. Thomason, who certainly was one of the greatest administrators that ever adorned the services of India. I observed this tribute paid by so impartial an authority as Mr. Stephen, with the more satisfaction in that I have often seen with sorrow of late years—an unreasonable depreciation of the statesman who illustrated that period of Indian history. Perhaps while on this topic, and while adverting to the celebrated circulars of the Board of Revenue, Mr. Stephen might have mentioned the name of one even as great as Mr. Thomason, namely, Mr. Mertins Bird. Indeed, the Lieutenant-Governor now present, will bear me out in saying, that under Mr. Bird and Mr. Thomason, were trained the men now known to history, who made the Panjáb what it is, whose labours are attested by the present prosperous condition of the Panjáb, which indeed constitutes a living monument to their fame—a monument that will be durable as the Province advances in prosperity from generation to generation."

The Hon'ble MR. EGERTON wished to remark, with reference to his hon'ble friend's (Mr. Stephen's) observations on the backwardness of the Indian Government to legislate on land-revenue, that there had been in the Panjáb excellent reasons for the hesitation which Government had shown in dealing with that difficult and important subject. Legislation had not been postponed without a cause. When the English took possession of the Panjáb, they found a country inhabited by village communities—institutions characterized by remarkable fixedness and vitality. The officers entrusted with the administration of the conquered province were expressly instructed to respect the existing institutions of the country, and no one could doubt the policy of such an order. They had

been directed, moreover, not to assess severely, but to limit the Government demand to a moderate proportion of the profits of the soil. Both those orders had been carried out; the village communities remained in unimpaired vigour, and the agricultural classes had been raised by moderate assessments from the prostration to which the exactions of the Síkh Government had reduced them. Property in land might be said to have been created, and agricultural improvements had received a stimulus which had brought the prosperity of the proprietory body in the province to a very satisfactory level. There could be no doubt as to the general prosperity and content of the agricultural classes. They fully realized the advantages of a regular and indulgent administration of land-revenue law; no difficulty was experienced in collecting the tax, the arrears were altogether insignificant; compulsory process against defaulters was very exceptional, and the sale of land for arrears of revenue might be said to be unknown. This state of things was one which of course conduced very materially to the stability of the Government, as the experience of the mutiny had shown. And this accounted for the fact that the Government had been content to go on for a long time with a land-revenue law which was perhaps not very clearly defined by written enactments, but which was at any rate sufficiently distinct to be administered with results which were, on the whole, so eminently satisfactory. The time had now, however, come for substituting more distinct enactments for a system avowedly tentative and temporary. The very fact of our system having added so largely to the value of land, resulted in there being many claimants for it, and it was necessary that such claims should be investigated and adjusted by a strictly defined rule of law. He entirely concurred in the advisability of the legislation now contemplated, and was glad that the matter had fallen into the hands of one who had not allowed the many technical difficulties which beset it, and which persons not practically acquainted with the details of revenue law naturally found so repulsive, to deter him from thoroughly mastering it and reducing it to an intelligible and systematic arrangement.

The Motion was put and agreed to.

INDIAN WEIGHTS AND MEASURES OF CAPACITY BILL.

The Hon'ble MR. STEPHEN also introduced the Bill to regulate the weights and measures of capacity of British India, and moved that it be referred to a Select Committee with instructions to report in four weeks. He said that he had, on asking leave to introduce the Bill, informed the Council of the circumstances under which this Bill was being proceeded with. It was unnecessary again to trouble the Council with a statement of those circumstances. The present Bill was merely a re-enactment of the disallowed measure of last year, with the omission of those provisions to which the Secretary of State had taken exception, and of certain powers of making the act obligatory, with which it did not appear desirable that Government should be invested.

The Hon'ble MR. STRACHEY said, that he wished, with His Excellency's permission, to make a few remarks on this Bill, because he had seen signs of considerable misconception on the part of the public in regard to what had occurred, and he thought it was important that it should be distinctly understood that, although the Secretary of State had disallowed the Act passed by this Council last year, there had never at any time been, nor was there now, any difference of opinion between the Secretary of State and the Government of India, regarding any principle involved. The only difference had been, how the principles on which all were agreed should be carried into practice. The question at issue had been one of procedure only.

MR. STRACHEY thought it might be useful to recall to mind very briefly the history of this measure. The memory of public matters in India was short,

and a good deal had been stated on the present subject, which showed complete misapprehension of the facts. It seemed to be supposed by some people that the Government had an intention of forcing upon India the metric system of France, or he ought rather to say, of Europe, for with the exception of England, it was the system of almost the whole of civilized Europe. The Government never had, and never would have, any such insane idea. The truth was this—There was, at the present time, no system of weights and measures in India recognized by law. People often talked of British Indian maunds and seers, but these weights had no legal existence. There was probably no other country in the world with a Government calling itself civilized, of which this could be said, and it had long been admitted to be a matter of essential importance, that some definite system should be adopted. The only doubt had been what that system was to be.

There had been a general agreement that the most convenient unit of weight for India would be a *seer*, because this was the weight more commonly known to the people than any other. The average weight of Indian seers was found to be about 2¼ lbs. avoirdupois—2 lbs. was decidedly below the average, and so was the old British Indian seer which weighed 80 *tolas*. The kilogramme of the metric system was equal, within an almost inappreciable fraction, to 2¼ lbs. avoirdupois; and, looking at the question from a purely Indian point of view, in the interests of the people of India alone, and apart from all theoretical considerations, the Government of India came to the conclusion, that this was the most convenient unit of weight that could be chosen. This fortunate accident of the practical identity between the kilogramme and the average Indian *seer*, gave us the great advantage of placing our official system of weights in correspondence with that which already existed in the greater part of the civilized world, and which might probably be ultimately introduced into England. This conclusion had been adopted by the Secretary of State and by the Government of India, and it was approved last year by this Council, which had then the advantage of the presence of commercial gentlemen of much eminence, without a dissentient voice. It had always been agreed, that the new system ought not, in regard to private trade and dealings, to be forced upon any section of the public, until the public was really prepared to receive it with approval. The Government of India and the Secretary of State, agreed in the first instance, that it was desirable to deal at present with weights only, and not with measures of length. The Government of India, afterwards thought it desirable to take the opportunity of defining also in the new law the future standard of length, but the Act was so worded that no compulsory powers for its introduction could, under any circumstances, be taken. The metre was declared to be the official unit of length, because it was the opinion of the highest engineering and other authorities, that the unit of weight being that of the metric system, the unit of length of the same system, would be the most convenient that could be chosen for official purposes. But it was never proposed to force it on the public. The Secretary of State thought, that the original conclusion was the best, that no reference to measures of length should be made in the Act, and that certain sections containing compulsory powers in regard to weights went further than was desirable. But, in regard to the essential questions at issue, there never had been any difference of opinion, and he (MR. STRACHEY) desired to repeat, that the Bill which his hon'ble and learned friend Mr. Stephen proposed to introduce to-day, represented in reality the views which the Government of India had always held, as exactly as that which had been disallowed by the Secretary of State.

His Honour the LIEUTENANT-GOVERNOR observed, in confirmation of what the Hon'ble Mr. Strachey remarked, as to the impropriety of calculating the seer at 2 lbs. avoirdupois, that he remembered in Lucknow serious discontent being occasioned by the introduction of a seer, which weighed only 2 lbs. The local seer weighed a fraction over that amount. The dealers took advantage

of the fact of a new seer being introduced, and charged the same price for the new seer, as they had for the old, and so got the advantage of the difference between the two seers. Every purchaser accordingly found himself mulcted to a corresponding amount, and serious dissatisfaction resulted.

The Motion was put and agreed to.

PANJAB REGULATIONS' BILL.

The Hon'ble MR. STEPHEN also applied to His Excellency the President to suspend the Rules for the conduct of Business.

The President declared the Rules suspended.

The Hon'ble MR. STEPHEN then introduced the Bill for declaring what laws are in force in the Panjáb, and moved that it be referred to a Select Committee with instructions to report in four weeks. He said:—"My Lord, this Bill is so closely connected with the Panjáb Land Revenue Bill that many of the observations which apply to the one apply to the other. I have pointed out in reference to the other Bill the peculiar manner in which the Bengal Regulations were introduced into the Panjáb, and I may observe that the laws upon subjects other than land-revenue, which were so introduced, were exceedingly numerous and extremely complicated. The difficulty of saying what law was introduced, and what was not, is quite as great in the one case as in the other; and I may add that questions of great importance have arisen on this subject between the Executive Government and the Courts of Justice. Some years since, a series of Regulations, which I believe to have been exceedingly wholesome, were made by the Executive Government, for the purpose of confining certain criminal tribes in various parts of the province within the districts in which they resided, and forbidding them to leave those districts without express authorization. These rules, which had been acted upon and proved beneficial for a considerable period, were declared by the Chief Court to be illegal; and the consequence of that decision has been that, for some time past, these tribes have been relieved from the restraint imposed upon them, and have been enabled to pursue the unlawful practices which this restraint was intended to prevent.

"This is one of the many illustrations that might be given of the extreme obscurity in which the law relating to the Panjáb has been involved by the manner in which it was introduced. The obscurity has been, to a considerable extent, cleared up by the Panjáb Government in its answers to a letter which was sent out in the time of my hon'ble predecessor Mr. Maine, calling upon the Local Governments of Non-Regulation Provinces to forward a return of all the laws, orders and regulations in force in those provinces which had acquired the force of law under Section 25 of the Indian Councils' Act. I hold in my hand the book which was forwarded to us as an answer to these questions.

"It contains 408 closely printed octavo pages, and it also contains three schedules of regulations which are considered to have been introduced into the Panjáb. These schedules fill 17 other pages, in addition to the 408 pages already mentioned. I need not remind the Council of the observations I made on this matter, when I obtained leave to introduce this Bill some time ago. I may, however, say that the Bill is now being prepared with the same object and advantages which we had in preparing the Revenue Bill, and I hope that, when taken in connection with that measure, it will completely wipe away all the rules contained in this book, and all the regulations, with the exception of a few specified, referred to in this schedule.

"I will now shortly go through the Bill and state what its provisions are. It begins by stating what law is to be in force in the Panjáb. First, all Acts of Parliament generally applicable to British India, then, all Acts of the

Governor General in Council which apply either to the whole of British India or expressly to the Panjáb; then, such of the Bengal Regulations as we do not propose to repeal. These are contained in a schedule by themselves, and I am happy to say that they will be five in number, and no more. Two of them refer to mortgages, one to the declaration of Martial Law, one to the confinement of State prisoners, one to alluvion and diluvion, and another to a very small matter connected with the arrest of European soldiers who are liable to the jurisdiction of Courts Martial. Of these, those two which relate to mortgages and to the arrest of soldiers will, I hope, be soon repealed by consolidation Acts.

"Those which remain, refer to the subjects of Martial Law, State prisoners, and alluvion and diluvion. In questions regarding inheritance, marriage, female property, adoption, dower, guardianship, minority, &c., the Courts are to administer the Muhammadan or Hindú law with certain modifications. In cases not otherwise specially provided for, they are to decide according to justice, equity and good conscience. These words, though vague in themselves, are pretty well understood throughout British India, and are not likely to lead to any misapprehension.

"These general provisions are followed by specifications of particulars in the Hindú and Muhammadan law, which are to be modified. I need not trouble the Council at any length upon this matter. The principal subjects to which the modifications refer are the law of inheritance, the law of minority, the law of betrothal, and pre-emption. These modifications are contained in the work drawn up by my hon'ble friend Sir Richard Temple, when Secretary of the Panjáb, which has long been known under the title of 'The Panjáb Civil Code.' It is an excellent work, but, having been drawn up by an officer much engaged in other business, and not at the time specially familiar with law, it has been found to give rise to a good deal of litigation and has been made the subject of many doubtful decisions.

"I may observe that, in his preface to the original edition of the work, the author makes the following observations: 'It is not indeed hoped that the first part contains anything approaching to a digest of law or of rights. Omissions and imperfections may doubtless be discovered in every section. Still the principles are believed to be correct as far as they extend, and to merit the attention of Judicial Officers in the Panjáb in the absence of any other and better treatise.'

"This is a just and modest view of the nature and value of the Panjáb Civil Code, and it deserved more general acceptance than it appears to have gained. The Panjáb Civil Code has been regarded by many authorities as having the force of law, and an enormous number of decisions have been made on various parts of it. It has been swollen from a work of a few pages into one of those enormous receptacles of notes, comments, sections of Acts, and general observations, which pass in England under the name of legal text books. We propose to codify those parts of it which elaborate the provisions of Muhammadan and Hindú law, but altering their wording and arrangement, and adding to them the substance of such decisions as have been given by Courts of Justice in the Panjáb. One point in the Panjáb Civil Code specially requires notice. It contains provisions as to insolvency which I believe are peculiar to the Panjáb, the subject being provided for in other parts of the country by certain sections in the Code of Civil Procedure. These provisions we propose to re-enact with certain additions suggested by experience.

"I now come to the regulation law which has been introduced into the Panjáb. Here, again, I have carefully examined the different regulations referred to in the three schedules which Mr. Barkley has appended to his book. The regulations of the first schedule refer to the subject of criminal justice. They are rendered almost entirely obsolete by the enactment of the Indian Penal Code, which was extended to the Panjáb in 1862. We propose to dispose of the whole of these criminal regulations by enacting that the Penal Code shall have a retrospective operation as to all crimes committed in the Panjáb before it came into operation in 1862. In this there can be no hardship. In the first place, it is very unlikely that any such criminals should hereafter require to be

tried, and, in the second place, if the case should arise, the Penal Code merely enacts the substance of the pre-existing criminal law, and adds in no respect to its severity.

"With regard to the regulations in the second schedule, which relate to civil justice, and which are twenty-six in number, I have carefully gone through them, and I am happy to say that, having examined them with considerable attention, I find that the whole amount of law still unrepealed and contained in these regulations may be condensed into about twelve sections, and no more. Of these twelve sections, my friend Mr. Cunningham says we may omit four. Eight sections, therefore, of the old regulations will still be enforced under this schedule. The regulations of the third schedule relate to revenue law, and these regulations will all be disposed of by the Act which I have already introduced. The Bill will conclude with power to the Local Government to make rules upon a considerable number of local matters.

"I need not enter upon this topic. It is obvious that the Local Government ought to possess powers of this sort, and the particular matters over which they may have power will be hereafter carefully considered in Committee.

"The result of the whole is this: the existing law of the Panjáb, other than the law which is contained in Acts of Parliament and Acts of the Council of the Governor General, will be reduced to two Acts, namely,—the Revenue Act, which I have already introduced, and the Act which I am now introducing, which will contain fifty-eight sections and a schedule specifying four or five Bengal Regulations. The effect of this will be to enable the officers to administer the province, to know definitely the law which they will have to administer, and to deliver them entirely from the vast and very obscurely drawn body of laws which, to a certain extent, has been half introduced into the Panjáb from other parts of the empire."

His Honour the LIEUTENANT-GOVERNOR expressed his entire concurrence in the course now proposed. The new law would be of great assistance to the judicial branches of the administration.

The Motion was put and agreed to.

RAILWAY BILL.

The Hon'ble MR. COCKERELL moved that the report of the Select Committee on the Bill to amend the Railway Act be taken into consideration. He said, that this Bill, it would be remembered, was introduced into the Council nearly six months ago by their late colleague Major-General Strachey, with the object of amending the railway law in certain particulars, two only of which were of any special importance.

One of those amendments related to the fencing of railways. The existing law made it obligatory to fence every railway throughout its entire length. For the reasons stated on the introduction of the Bill, and to which he need not advert now, it was proposed to remove this restriction, and, in substitution therefor, to confer on the Government the power of determining what railways should or should not be fenced.

Without, however, going into the question of the expediency of providing fences for all railways, he might remark, that looking to the only manner in which an obligation imposed in express terms by law in regard to such a matter could be enforced, the enactment of such an obligation was obviously unsuited to the circumstances of railways in this country, which were either, as in the case of guaranteed railways, virtually the joint property of a Railway Company and the State, or wholly the property of the latter. The important question which the Committee had had to consider, in connection with this change of the law, was its legitimate effect upon the special provisions of the existing law in regard to the liability of the owners or persons in charge of cattle trespassing or being driven upon a railway.

As the law now stood, the perfect equity of such provisions admitted of no doubt, inasmuch as every railway being fenced throughout, presumably no cattle could get within the enclosure of the railway except through the gross and

culpable carelessness or wilful act of the person who had charge of such cattle. But, under the proposed change of the law, the question arose whether, in the case of unfenced railways, the special penalties (and he had used the word 'special' in contradistinction to the ordinary penalties allowed by the Cattle Trespass Act) for cattle trespassing or being driven upon such railways, could equitably be imposed.

In the absence of the mover of the original Bill, it could not be clearly ascertained whether that measure was intended to bring the special penalties to bear on the owners or persons in charge of cattle trespassing or being driven upon *unfenced* railways. The words used in the sections referring to this matter were—"Any railway duly provided with fences in accordance with the rules applicable to such railway." The last words of the sentence, it would be observed, so far qualified those which preceded them, that without any straining of language, an unfenced railway would come within the legal construction to be placed upon such a definition. In any case it was clearly necessary to place the intention of the legislature in this matter beyond the possibility of misconstruction, and the question which the Committee had to determine was, whether the clauses imposing the special penalties above referred to, ought to apply to unfenced railways. The question was not so one-sided as it might at first sight appear, for the very existence of a law which attached penalties to the trespass of cattle in a country where the enclosure of the property to be protected was quite exceptional, must be taken to be a distinct affirmation by the legislature of the principle that it was justifiable to impose some responsibility on the owner of trespassing cattle in cases in which the owner of the property to be protected had done nothing on his part towards its protection. The question of the imposition of responsibility for the trespass of cattle under those circumstances now to be settled, was, therefore, merely one of degree, and, after a careful consideration of the subject, the Committee had adopted the safer conclusion that the penalties for the trespass of cattle on unfenced railways should have been confined to those prescribed by the Cattle Trespass Act, so that the more stringent provisions of the law in this matter should have applied only where the railway was properly fenced.

The other important amendment of the law contained in the Bill as introduced, was designed to secure greater efficiency in the maintenance of discipline amongst the persons employed on a railway, which was so essential to the safety of the travelling public. For this purpose it was proposed to empower the Railway Companies, or in the case of a State railway, the officer of Government charged with the control of such railway, to frame subsidiary rules not inconsistent with the general rules sanctioned by the Government, and to attach the same legal consequences to the infringement of such subsidiary rules, as would, under the existing law, apply to the breach of the rules sanctioned by Government.

The consideration of this amendment, led the Committee to the review of those sections of Act XVIII of 1854, which prescribed the conditions under which persons employed on a railway were at present liable to the penalties therein defined. By section twenty-six of that Act, any officer or servant of a Railway Company doing anything which he was by law prohibited from doing, or wilfully or negligently omitting to do any act which he was in like manner bound to perform, and thereby endangering the safety of any person travelling or being on such railway, was made liable to certain punishment; and, further, by section twenty-nine of the same Act, every such officer and servant was declared to be legally bound to do whatever he was required to do by any regulation of the Railway Company which had been sanctioned by the Government.

In the opinion of the Committee, the purport and effect of those two sections might be much more clearly and intelligibly expressed. Moreover, the only object of the provision of the original Bill for empowering the Railway Company or person in charge of a State railway to make subsidiary rules, was to extend the legal consequences of the breach of the general rules referred to in the above sections to the wilful violation of such subsidiary rules.

All this, it was thought, could be as completely and much more simply attained by the substitution for sections twenty-six and twenty-nine of Act XVIII of 1854, and section eight of the original draft, of the new sections twenty-six and twenty-eight as drawn in section two of the amended Bill.

The only alteration of substance originated by the Committee, was the imposition of certain defined penalties of inconsiderable extent for breaches of rules specially sanctioned and allowed by Government, even where such breach did not directly endanger the safety of travellers or persons on any railway.

The existing law provided no penalty in such cases unless some distinct criminal offence was committed. It was, for obvious reasons, desirable, in the interests of the travelling public, as well as for the due protection of railway property, that the Companies and persons entrusted with the control of railways should have some greater power than they have at present for enforcing discipline and obedience to rules.

It might be said that the liability to forfeiture of situation should be a sufficient security for general obedience to orders and rules on the part of the railway servant, but this was a mode of punishment ill adapted to the majority of cases, and, if on no other ground, there would be this strong objection to its general application that it worked both ways, not merely as a punishment to the employed, but also to the injury of the employer.

But it was hardly to be expected, that this provision would completely attain its intended effect unless it could be applied as promptly in the case of the considerable section of the employés on any railway, who were European British subjects, as in that of other persons so employed. It was proposed, therefore, to confer summary jurisdiction in such cases, in respect to European British subjects, on the local Magistrates who were also Justices of the Peace.

Lastly, MR. COCKERELL remarked that the Bill was undoubtedly open to the objection which attached to all patch-work legislation, but this could not, under the circumstances of the case, have been avoided.

It would have been more satisfactory to have repealed the whole of the original Act of 1854, and the three or four subsequent enactments on the same subject, and to have re-enacted so much of the entire law as it was desirable to retain in one consolidated Act; but, as was before stated, the Government was at present unable to undertake any permanent legislation in the matter of railways, as there were many questions connected with the subject on which the Government and the managing Boards of the Railway Companies in England had as yet arrived at no definite agreement.

Fortunately for the attainment of the desired object: the early consolidation of the law relating to railways, the task of adjusting the necessary details and arranging the basis of a permanent legislative measure, was in the hands of Major-General Strachey, now in England, whose well-known energy in carrying out whatever he undertook, was a sufficient guarantee that there would be no needless delay in the matter.

The Motion was put and agreed to.

The Hon'ble MR. COCKERELL then moved that the Bill as amended be passed.

The Motion was put and agreed to.

The following Select Committees were named:

On the Bill for consolidating and amending the law as to land-revenue procedure in the Panjáb, His Honour the Lieutenant-Governor of the Panjáb, the Hon'ble Mr. Strachey, the Hon'ble Sir R. Temple, the Hon'ble Messrs. Cockerell and Egerton, and the Mover.

On the Bill to regulate the Weights and Measures of Capacity of British India, the Hon'ble Messrs. Strachey and Cockerell, and the Mover.

On the Bill for declaring what laws are in force in the Panjáb, His Honour the Lieutenant-Governor of the Panjáb, the Hon'ble Mr. Strachey, the Hon'ble Sir R. Temple, the Hon'ble Messrs. Cockerell and Egerton, and the Mover.

The Council adjourned to Thursday, the 28th September 1871.

H. S. CUNNINGHAM,
Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

SIMLA;
The 5th September 1871.

No. 37 of 1871.



SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, SEPTEMBER 30, 1871.

OFFICIAL PAPERS.

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GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Reports on the state of the season and prospects of the crops.

ON the whole, this fortnight's reports need cause no anxiety.

In the Lower Provinces prospects are "improving generally;" in Eastern Bengal and Orissa, they are even "very good."

In the Punjab things look brighter than they did a fortnight ago.

In Madras, the Central Provinces, the States of the Central India Agency, the Hyderabad Assigned Districts, Mysore, and Sindh, good harvests may reasonably be expected.

In Rajpootana prospects are in some places unpromising, but most of the States expect "good to fair khureef crops."

The Bombay Presidency still suffers from want of rain, while the floods of the Gogra, Goomtee, Tonse, and other rivers have seriously damaged the crops throughout large tracts of Oudh and the North-Western Provinces.

The prospects of cotton continue on the whole favourable.

Reports on the state of the Season.

No.	Presidency or Province.	District.	Date of District report.	Rain-fall for fortnight preceding.	Date of message from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
1	MADRAS ...	Masulipatam ...	September 27 ...	5·8	September 28 ...	Cultivation improving.	Government consider prospect of season and markets fairly good.
		Negapatam	„ 28 ...	1·9	„ ...	Prospects good.	
		Kurnool	„ 27 ...	Slight showers.	„ ...	Prospects favorable.	
		Trichinopoly... ...	„ ...	·5	„ ...	Prospects fair, rain insufficient.	
		Calicut	„ 26 ...	1·3	„ ...	Prospects favorable.	
2	BOMBAY ...	Hyderabad—Sind ...	„ 27 ...	No rain	„ ...	Indus still falling. Kharif season safe. Crops excellent and season healthy in all parts. No cattle disease.	Rain much wanted everywhere. Prospects generally bad. Cotton crops in Goojrat, Khandeish, and Sind generally reported to be healthy and progressing fast, but requiring more rain. In Goojrat prospects fair. In Deccan and Southern Mahratta Country, middling. In Khandeish, bad. In Sind, good so so far as is at present known.
		Ahmedabad	„ ...	„	„ ...	Prospects for rice not very good, and for other crops only fair.	
		Poona	„ ...	„	„ ...	In four Western Districts crops fair. In four Eastern Districts sowing of rabi retarded for want of rain. The few growing crops not promising. Grain dear; prices rising.	
		Dharwar	„ ...	1·7	„ ...	Rice crops have failed, excepting those in irrigated fields. The heavy rain-fall on 26th, 1·5 inches, at Dharwar, and for many miles round, will revive the crops. Indication of more rain.	
		Sholapur	„ ...	5·55	„ ...	State of crops favorable.	
		Khandeish	„ 28 ...	No rain	„ ...	No rain at Dhoolia. Crops failed.	
3	SIND	.....	„ ...	*	.....	Prospects of kharif season good on the whole. Cotton reports favorable. In Lower Sind population in hill districts, dependent on rain, have no crops for food or forage for the cattle; latter dying in numbers in consequence.	* No rain in Sind during past week. Clouds on sea coast appear and disappear. Strong winds; atmosphere moist; temperature mild. Maximum in shade 80° at noon. Inundation steadily subsiding. Fever slightly prevalent.
4	BENGAL ...	Patna Division ...	„ 27 ...	†	„ ...	Rice crops reported to be much damaged, but not yet known to what extent.	† Continual rain and heavy floods.
		Dacca „ ...	„ ...	5·3	„ ...	Prospects of the crops very good.	
		Burdwan „ ...	„ ...	.....	„ ...	The prospects of the crops good and the weather fair. Throughout the Division the crops are generally good on high lands, but on low lands have been partially destroyed. A peculiar blight is causing injury to rice in Bancoorah.	
		Cuttack „ ...	„ ...	4·76	„ ...	Thunder-storm in Pooree, followed by a gale. Rains general; prospects very good.	*General remarks.*—Prospects improving generally.
		Bhagulpur „ ...	.....	...	„ ...	Almost the whole of the Begoo Serai Sub-Division in Monghyr has been again under water. Prospects of rice there uncertain, but good in other places.	
		Rajshahye „ ...	.....	...	„ ...	River has risen again before Moorshedabad. Prospects of crops improving.	
		Presidency „ ...	.....	...	„ ...	Floods subsiding slowly. Crops good where uninjured by inundation. In Nuddea a little fever is prevalent; cattle also suffering from disease.	
5	N. W. PROVINCES ...	Meerut ...	.....	No rain	„ ...	Fair average autumn crops being cut, and land prepared for winter sowings. Prospects good.	Damage to crops very great. Ganges, Gogra, Gumti, and Tonse in high floods. Immense damage to the towns of Jounpur and Azimgurh, and villages swept away.
		Bareilly ...	.....				
		Agra ...	.....				
		Allahabad ...	.....	8·			
		Benares ...	.....	9·			
6	PUNJAB ...	Ambala ...	September 27 ...	·1	„ ...	Agricultural prospects average, but rain much wanted.	Harvest prospects good in Delhi and Ambala Divisions; in Jalandhar Doab not so good, but still fair. Seasonable rain has fallen in Goordaspur, Sialkot, and Rawal Pindi. In Multan crops promising on land irrigated by inundation canals. In frontier Districts out-turn generally expected to be below average. Harvest prospects are least favorable in Hissar and Lahore Divisions.
		Jalandhar ...	„ ...	*Nil.*	„ ...	Crops fair.	
		Lahore ...	„ ...	„	„ ...	Crops on unirrigated lands completely lost, and those on lands irrigated from Bari Doab Canal have suffered greatly. No supply of water in Chunian Tahsil from main branch for last six days. Supply from Lahore branch very small. Inundation canals still closed.	
		Multan ...	„ 21 ...	„	„ ...	Kharif prospects same as in preceding report. In Tahsil Serai Sidhu preparations for coming rabi are being carried on extensively owing to river inundations.	
		Rawul Pindi ...	„ 27 ...	7·	„ ...	Harvest prospects good.	
		Peshawur	„ ...	*Nil.*	„ ...	Kharif out-turn expected to be three-fifths of an average one.	
7	CENTRAL PROVINCES	Raipur	„ 23 ...	3·76	„ ...	Prospects of kharif crops now excellent all over district, and weather favourable for preparation of rabi lands.	Cattle murrain in two Tahsils.
		Bilaspur	„ ...	4·21	„ ...	Crops healthy.	
		Sambulpur	.....	4·91	„ ...	Crops suffered slightly south of Mahanadi, but rain has now prevented any serious loss.	

No.	Presidency or Province.	District.	Date of District report.	Rain-fall for fortnight preceding.	Date of message from Local Government or Administration.	State of Agricultural prospects.	Remarks of Local Government or Administration.
	Central Provinces,—*contd.*	Nagpur	September 27 ...	5·05	September 28 ...	Kharif crops in good condition. Fields ready for rabi. Til sowings nearly completed. Prices hardly altered since last report.	
		Wardha	.....	4·83	„		
		Jabalpur	„ 27 ...	6·33	„ ...	Kharif prospects excellent. In Dumoh cotton, juar, and urd suffered from excessive rain. In Seoni cotton flowering and promising well.	
		Hoshangabad ...	„ ...	17·5	„ ...	Considerable damage done in places to cotton and juar. Still, on the whole, prospects good.	
		Betul ...	„ ...	9·51	„ ...	Prospects good. In Narsingpur favourable, but damage expected if rain continues.	
		Nimar ...	... ...	1·33	„ ...	Prospects excellent.	
8	Oudh ...	Lucknow ...	„ 27 ...	15·6	„ ...	General damage to kharif ; rabi preparations much retarded.	Accounts of serious damage to the crops by the unprecedently heavy rains are received from all parts. The Rapti, Tonse, Gumti, Marha, and other streams have overflowed and caused much loss of property. Rice, kodo, mash, arhar, and juar, have suffered most. Gonda, Baraich, Fyzabad, Sultanpur, Barabunke, Rai Bareilly, and Pertabgurh have apparently suffered most severely.
		Fyzabad ...	„ 28 ...	22·7	„ ...	Marha has overflowed, serious damage to kharif.	
		Bangalore	„ 27 ...	2·59	„ ...	Dry crops were beginning to look parched, and small tanks becoming exhausted, but recent showers have removed apprehensions; wet crops thriving.	
9	Mysore ...	Mysore	„ ...	·62	„ ...	Condition of crops partially improved, but want of rain felt particularly in three Sub-Divisions.	South-west monsoon continues ; rain-fall good ; agricultural prospects favorable.
		Coorg	„ ...	3·94	„ ...	Paddy and raggi crop prospects good. Coffee suffered to certain extent from "rot" and "borer."	
		Serohi	„ 23 ...	*Nil**	„ ...	Prospects very unfavourable.	* Rain very badly wanted.
		Mewar	„ ...	1·1	„ ...	Fear of rabi crops failing.	
		Marwar	„ ...	*Nil*	„ ...	Prospects in some places good, in others apprehension of failure.	
		Deolalee	„ 16 ...	„ †	„ ...	Prospects good.	† Rain required.
		Kotah	„ ...	1·2	„ ...	Good.	
10	Rajpootana ...	Jhallwar	„ ...	1·3	„ ...	Good.	
		Ulwur	„ ...	·5	„ ...	Prospects good, except juar. Bajra is now being reaped—good yield.	
		Bhurtpur	„ ...	‡	„ ...	Crops thriving, except juar, which has been ravaged by caterpillars.	‡ Partial showers.
		Jeypur	„ 27 ...	*Nil*	„ ...	Prospects everywhere favorable.	Rainy season has ceased in Rajpootana. Bhurtpur, Jeypur, Ulwur, Kotah, Marwar north of Palee, Mutlanee, and Jeysulmere have good to fair kharif crops. Meywar an eight to twelve-anna crop. Marwar south of Palee. Siaghee, and Bikanere a two to four-anna crop ; only southern Marwar a failure.
		Ajmere	„ ...	„	„ ...	Prospects in Lower Marwara very bad.	
	West Berar.	Akola	„ 23 ...	2·	„ 27 ...	Harvest prospects have materially improved by recent rains, and a fair average yield is now expected.	
		Buldana	„ ...	2·45	„ ...	Very good.	More rain is needed for both harvests, especially for the spring harvest, and the wells are still very low.
11	Berar	Bassin	„ ...	4·04	„ ...	General prospects good, but rice and pulse crops have somewhat suffered from want of rain at commencement of the season.	
	East Berar.	Woon	„ 27 ...	4·	„ ...	Crops throughout Division thriving.	
		Ellichpur ...	„ ...	2·25	„ ...	Prospects very good. Cotton in flower.	
		Oomraotee ...	„ ...	2·25	„ ...		
		Indore	„ ...	·23	„ ...	Weather favorable for crops since last report. Prospects good.	
		Gwalior	„ ...	1·54	„ ...	Juar and bajra crops, excepting on high lands, injured. Rice and cotton good ; rabi prospects favorable.	
12	Central India ...	Neemuch	„ ...	·33	„ ...	Crops favorable.	Health in Central India excellent. On the whole, season highly favorable.
		Baghelcund: Nagode ...	... ...	heavy quantity, uncertain	„ ...	Prospects of kharif harvest very bad.	
		Baghelcund: Myhere ...	... ...				
		Baghelcund: Sohawul...	... ...				
		Rutlam	September 27 ...	·6	„ ...	Agricultural prospects good.	

Cotton.—The prospects of the cotton crops in Western and Central India continue favorable. Rain during the fortnight has brought the plants forward. In the Ganges Valley excessive rain has caused considerable damage, and fine weather is much wanted.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

IRRIGATION OPERATIONS OF LOWER BENGAL UP TO 31st JULY 1871.

Circle.	Canal.	Water supplied during 1871-72: Full supply depth.	Estimated full discharge in cubic feet per second.	Average depth throughout the month.	Average discharge in cubic feet per second throughout month.	Approximate area irrigated during July 1871: District.	Area actually receiving water during the month, in acres.	Of column 8 area receiving water for the first time during current year.	Total of column 9 for all previous months of current year.	Total area irrigated up to date during the current year.	Rain-fall: Inches during the month.	Inches up to date during the year.	Average of ten previous years for the same period.	Navigation Return: Nature of Traffic.	Number of Boats.	Tonnage.	Ton-mileage.	Approximate value of goods.	Chief Irrigation: Per column 8.	Per columns 8 & 9.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Orissa	High Level	8	675	4·63	277	Cuttack	6,674	3,411	3,265	6,676	15·32	32·73	26·54	Local Government	61 70	177 1,015	2,672 12,690	1,915 11,023	Rice	Rice	The heavy rain-fall has prevented spread of irrigation.
Orissa	Kendrapara	7	1,262	4·66	652·52	Ditto	14,810	12,160	2,650	14,810	15·32	32·73	26·54	Local Through Government	101 306 25	698 2,674 310	14,503 106,970 5,381	27,602 517,073 1,354	Rice	Rice	
Orissa	Taldunda	8	1,300	7·	75·	Ditto	2,325	1,825	500	2,325	15·32	32·73	26·54	Local Government	29 196	115 3,771	615 39,163	840 3,275	Rice	Rice	
South-Western.	Midnapoor	8	875	..	..	Midnapoor	..	..	5,963	5,963	13·34	36·64	38·01	Local	1,983	9,756	81,668	596,116	Rice	Rice	Drainage has been a pressing want during the month, not irrigation. Until ample provision is made for drainage, irrigation must be in all years of similar rain-fall practically impossible.
South-Western.	Panchkoorah	6	240	..	..	Howrah	..	..	..	..	12·85	37·75	Not available.	....	..	..	..	..	....	....	
South-Western.	Tidal Canal	..	..	..	..	Midnapoor	..	..	..	..	..	..	..	Local Government	945 4	5,926 37	154,073 975	116,646 860			Ranges Nos. 1 and 3 opened from 1st July.
	July 1870.					Total	..	23,809	17,396	12,378	29,774										
Orissa	High Level	..	..	..	..	Cuttack	..	333	333	47	380	7·33	17·83	25·79							
Orissa	Kendrapara	..	..	..	..	Ditto	..	1,292	205	2,151	2,356	7·33	17·83	25·79							
Orissa	Taldunda	..	..	..	..	Ditto	..	..	..	..	..	7·33	17·83	25·79							
South-Western.	Midnapoor	..	..	..	..	Midnapoor	..	26,604	16,011	10,593	26,604	5·30	19·05	..							
South-Western.	Panchkoorah	..	..	..	..	Howrah	..	208	208	..	208	10·99	25·89	..							
						Total	..	28,437	16,757	12,791	29,548										

IRRIGATION OPERATIONS OF FUSL KHURREEF IN THE PUNJAB UP TO 31st JULY 1871.

Canal Division.	Water distributed during July: Depth in Canal at regulating gauge: Full supply.	Depth in Canal at regulating gauge: Actual throughout July.	Gross consumption, cubic feet per second: Estimated full supply.	Gross consumption, cubic feet per second: Actual average throughout July.	Navigation Return Canal: Principal items of Traffic: Up.	Down.	Land irrigated (approximate): Zillah.	Acres.	Rain-fall: Average.	During month.	Chief crops (approximate): Name.	Area in acres.	Remarks.
									Inches.	Inches.			
B. D. Canal. 1st Division	4·90	2·77	.....	822·95	...	.....	Goordaspoor ...	7,099	4·99	11·60			568·85 cubic feet per second passed out of the various escapes.
B. D. Canal. 2nd „ M. B.. Lower	4·60	1·41	.....	306·71	...	.....	Umritsur ...	9,079	...	6·0	Cotton ...	14,649	
B. D. Canal. „ „ Lahore Branch	3·30	2·22	.....	412·01	...	.....	Lahore ...	22,143	...	...	Rice ...	6,198	
			3,073·6	.....	...	.....	.....	.....	...	...	Sugarcane...	5,715	
											Others ...	11,759	
Corresponding period of last year..	.....	.....	3,073·6	2,082·05	*Nil.*	*Nil.*	.....	40,779	...	...	.....	40,779	
Total Baree Doab Canal ...	.....	.....	3,073·6	1,541·67	*Nil.*	*Nil.*	.....	38,321	...	...	.....	38,321	
Western Jumna Canals. Kurnaul Division	4·33	1·81	.....	82·10	...	175,825 logs, kurrees, bullies, &c.	Umballa ...	961	14·00	21·67	Cotton ...	76,220	29·38 cubic feet per second passed down the Boodhakhena escape.
Western Jumna Canals. Delhi „ ...	4·40	.....	.....	468·33	...		Kurnaul ...	21,015	8·20	8·90	Rice ...	9,889	
Western Jumna Canals. Hansi „ ...	8·80	6·70	.....	419·00	...		Delhi ...	30,607	...	6·80	Sugarcane...	27,618	
Western Jumna Canals. „ Bulla Head	8·40	6·30	2,546·0	211·00	...		Rohtuck ...	33,896	4·1	4·20	Others ...	6,308	There is, therefore, an approximate decrease of 9,614 acres irrigated from the Perennial Canals, as compared with last year. The cause of this is stated to be the increased rain-fall.
							Hissar ...	21,354	...	...			
							Jheend ...	12,027	...	...			
							Bikaneer ...	175	...	...			
Corresponding period of last year..	.....	.....	2,546·0	1,398·08	...	157,193	.....	127,191	...	...	.....	127,191	
Total Western Jumna Canals ...	.....	.....	2,546·0	1,180·43	...	175,825	.....	120,035	...	...	.....	120,035	
Inundation Canals. Upper Sutlej Division	.....	.....	.....	.....	...	.....	Lahore ...	6,000	1·73	1·39	Detail not obtainable for want of Establishment.	.....	
Inundation Canals. Lower Sutlej and Chenab	.....	.....	.....	.....	...	.....	Montgomery ...	45,000				.....	
Inundation Canals. Indus Canals ...	.....	.....	.....	.....	...	.....	Mooltan ...	111,555	...	1·20		.....	
							Dehra Ghazee Khan ...	117,000	...	...		.....	
Total Inundation Canals ...	.....	.....	.....	.....	...	.....	.....	279,555	...	...	.....	279,555	
Delhi and Goorgaon Works ...	.....	.....	.....	.....	...	.....	.....	*Nil.*	...	...	.....	*Nil.*	
Total Delhi and Goorgaon Works	.....	.....	.....	.....	...	.....	.....	*Nil.*	...	...	.....	*Nil.*	
Perennial Canals, corresponding period of last year ...	.....	.....	.....	.....	...	.....	.....	167,970	...	...	.....	167,970	
Perennial Canals, Grand Total ...	.....	.....	.....	.....	...	.....	.....	158,356	...	...	.....	158,356	

T. M. KIRKWOOD, C. S.,
Canal Revenue Superintendent, Bengal.

W. BROADFOOT, *Lieutenant, R. E.,*
Asst. Secy. to the Govt., Punjab, P. W. D., Irrigation Branch.

MURREE;
The 12th September 1871.

EXTRA SUPPLEMENT

TO

The Gazette of India.

CALCUTTA, TUESDAY, OCTOBER 3, 1871.

GOVERNMENT OF INDIA,

DEPARTMENT OF
AGRICULTURE, REVENUE AND COMMERCE.

PAPERS ON THE QUESTION OF EXTENDING THE PERMANENT SETTLEMENT TO THE UPPER PROVINCES OF THE PRESIDENCY.

CALCUTTA:
OFFICE OF SUPERINTENDENT OF GOVERNMENT PRINTING.
1871.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE AND COMMERCE.

PAPERS ON THE QUESTION OF EXTENDING THE PERMANENT SETTLEMENT TO THE UPPER PROVINCES OF THE PRESIDENCY.

No. 280, dated Allahabad, the 20th February 1869.

From—R. SIMPSON, Esq., Secy. to the Govt. of N. W. Provinces,
To—The Secretary to the Government of India, Home Department.

I am directed to forward, for the consideration and orders of His Excellency the Governor General in Council, the accompanying Minute recorded by the Lieutenant Governor on the rates for assessment of Pergunnah Baghput, Zillah Meerut, proposed by the Settlement Officer.

Minute on the rates for assessment of Pergunnah Baghput, Zillah Meerut.

The Sudder Board of Revenue in their address, dated 26th November last, submit for orders a communication from the Settlement Officer of Meerut on the principles to be followed in settling the rates for the assessment of Pergunnah Baghput; and as a new and important question is involved, I desire that it be reported to the Governor General in Council for directions.

The pergunnah was settled by Sir Henry Elliott above 30 years ago, and the assessment was fixed by him considerably below the full average demand in consequence of an impression that a higher assessment would be resisted by a combination among the influential proprietors (see paragraphs 17 to 19 of Mr. Forbes' Report).

The rate assessed per cultivated acre was not much above half of that assessed on neighbouring pergunnahs little better than it.

Since that period the pergunnah has, under the influence of irrigation from the Eastern Jumna Canal, rapidly improved. The cultivated area has increased from 73,500 acres to 98,369, and the land under irrigation from 12,623 to 59,000 acres.

The present report is a preliminary one submitted by Mr. Forbes to the Board, whose sanction is required to the average standard rates before these are actually used for assessment.

After studying the circumstances of the pergunnah and the rates of adjacent tracts, Mr. Forbes in his 28th paragraph has proposed a series of average revenue rates which, though possibly capable of some slight modifications, may on the whole be accepted as equitable.

From the lowness of the former assessment, and from the great improvement of the agriculture, these rates, when applied broadly to the area, give a return of above Rs. 2,45,000; whereas the present assessment is only Rs. 1,48,000.

"Revenue rates" are of course only approximate, and serve as a general test and standard of comparison. Assessments rise above or fall below the average, according to the capabilities of individual estates. But, nevertheless,

the final assessment ordinarily approximates to the rates thus preliminarily settled, and should so approximate.

The question which Mr. Forbes had before him is, whether he could safely raise the assesment at once from Rs. 1,48,000 to Rs. 2,45,000, or, if forced to adopt any lower figures, whether he could recommend the result for perpetual confirmation.

Looking to the circumstances of the pergunnah generally, and without having as yet gone into the assessment of any particular estate, Mr. Forbes says that he could not, without risk of injury to the pergunnah, suddenly and at once raise the assessment above Rs. 2,10,000; and even that, as will be seen, implies an increase of Rs. 62,000, or about Rs. 42 per cent. This assessment is, however, Rs. 35,000 below what Mr. Forbes considers the standard demand which may hereafter be reached; and if the settlement be now made in perpetuity, an eventual loss to that extent will, he thinks, be entailed on the Government.

The inability to fix the assessment at once at the higher amount is not occasioned by any want of present development; the pergunnah is in a very forward state, and the villages as a rule fully comply with the requisitions of a permanent settlement laid down by the Secretary of State. The difficulty lies in two things:

First, as a general principle, when the assessment of an estate is greatly below the standard, the raising of the demand to the full amount is held to involve risk to the well-being of the proprietors and prosperity of the property. It is safer to make the enhancement by steps, so that the circumstances of the proprietors may more easily adjust themselves to the diminished profits.

The second cause is that rents have not risen in proportion to the improvement of the pergunnah. This is more or less the case throughout the country, but it is especially the case in Baghput. The above consideration does not of course affect the question so far as fields cultivated by the proprietors themselves are concerned, which would appear to be a very general feature in this pergunnah. And in respect of lands held by non-proprietary tenants, no doubt their rents will eventually rise to the standard prevailing elsewhere, and this rise will be hastened, as it always is, by a rise in the revenue demand. But the process must be left to adjust itself, and though the rise may to a certain extent be anticipated by the assessing officer, it would not be wise to do so beyond very restricted limits.

Paragraph 21.

Paragraph 11, *et. seq.*

After inspecting the several districts under settlement in the Meerut Division last summer, I deemed it necessary to draw the attention of officers engaged in the work to the duty of loyally and faithfully carrying out the views of Her Majesty's Government in respect of proposals for permanent settlement without advertence to any theories they might themselves hold. The Minute on the subject, dated 6th June last,* was issued after approval by the late Viceroy. It was there laid down that Settlement Officers were not to refuse a permanent settlement from any theoretical considerations as to future rise of rent, seeing that this contingency had been fully adverted to by Her Majesty's Government and the Government of India before the determination had been announced to grant a permanent settlement. At the same time it was stated that in individual cases, where the rent was below that prevailing in the vicinity, and where in consequence a full assessment might not be attainable, the Settlement Officer was to notice the circumstances, leaving the decision, as to whether the settlement should be permanent or temporary in the hands of the Board and Government.

* Copy enclosed.

The present case is represented as being one of inadequacy in the rent, not of individual villages compared with the pergunnah, but in the prevailing rates of the pergunnah itself compared with other pergunnahs.

It is also a case in which all the conditions prescribed by Her Majesty's Government as entitling proprietors to a permanent settlement exist; cultivation in Baghput is highly developed; canal irrigation has reached its full limit. But the cultivator appears here to retain a larger share of the profits than elsewhere. And it is only where on this account, or otherwise in consequence of previous inadequacy of demand, a full assessment cannot be attained that a settlement in perpetuity could be refused to the proprietors.

The estates in the pergunnah will of course differ in their circumstances and ability at once to yield a full assessment.

There will be first, a class which either from not having 80 per cent. of their culturable area cultivated, or having a capacity of further improvement from canal irrigation, do not fulfil the Secretary of State's conditions. And these will of course be settled temporarily.

Of those which come up to the standard, there will no doubt be many that can afford at once to be assessed at a fair full demand, as judged by the standard of neighbouring pergunnahs where adequate rents prevail. These will without hesitation be so assessed and recommended for settlement in perptuity.

There remain estates of which the assessment cannot at once be brought up to the fair full assessment.

Perhaps these might be divided into two classes—

First.—Those in which the full assessment could be approached within, say, 30 or 40 per cent. Here the full assessment might be fixed in perpetuity—a deduction being allowed at the lower assessment, say, for a period not exceeding seven years. Thus an estate, of which the full permanent assessment might be Rs. 700, might, on the above considerations, be settled at any lower sum down to Rs. 500, for any period not exceeding 7 years, after which the full assessment would take effect. The above of course would be the extreme limits of divergence from the ordinary rule of immediate individual assessment at full rates. This I take it is the plan which the Board recommend.

Second.—If the full assessment could not be reached within those limits, then the settlement must be temporary.

It might be objected that the foregoing would be in effect the same system of "russuddee" assessment, recommended by Mr. Money and myself in our Minutes of March 1864, but to which Her Majesty's Government were not prepared to give their assent (see paragraph 17 of Sir Charles Wood's despatch, dated 24th March 1865). But it is really not so. Progressive assessment was in that case proposed for estates of which the agriculture and assets were undeveloped, the area under cultivation being less than 30 per cent. of the whole; and Her Majesty's Government were not prepared to give their sanction to any settlement in prepetuity, which is not based on the existing assets of the estates to which it is to be applied, "but is founded on a prospective estimate of their future capabilities." Here, however, as pointed out by Mr. Forbes, it is not a "prospective improvement" that is looked to. Agriculture is already fully developed.

The full assessment would thus be fixed on a consideration of present assets; but a deduction would be allowed temporarily in view of the hardship that would be caused by a sudden rise to the full amount.

There has been a very considerable rise in rents in Boolundshuhur since the settlement; the exact details are now under investigation, with the view of determining whether the assessment in that district can be recommended in perpetuity without undue loss to the State. I shall no doubt have the opportunity of bringing this question fully under the consideration of the Governor General in Council. I merely mention it here to show that if the course above sketched be followed with discretion and judgment and within moderate limits, there will be no difficulty of the proprietor being able within the period specified to adjust his rents to the enhanced demand. And generally where the full rise is not

made at once with the view of preventing hardship, the interval will sufficiently allow of the proprietors adapting themselves to their altered prospects.

Under any circumstances, great moderation will be enjoined on Mr. Forbes. Where a pergunnah has reached so high a degree of perfection as Baghput, it is always necessary to be moderate in the assessment of profits, which may decline but cannot much improve.

I shall be glad if the principle above proposed should meet with the approval of the Governor General in Council. The alternative will be to exclude from the benefits of permanent settlement a very considerable number of estates, which meet the requirements laid down by Her Majesty's Secretary of State, and are in every respect as likely as any other part of the country to benefit by the concession.

CAMP MOOFTEE-KA-POORWA; *The 13th February* 1869. } W. MUIR.

Minute by the Hon'ble the Lieutenant Governor, North-Western Provinces, on certain points connected with Permanent Settlement of the Land Revenue.

From expressions which came to my notice, both in conversation and in official papers, during my late tour, I am under the impression that the opinions entertained by individual officers on the expediency of a permanent settlement of the land revenue have led to a certain divergence, in the practice and standard they have set before them, from the principles lands down by the Home and Indian Governments for the regulation of the settlement.

I am far from thinking that this divergence is intentional. The high and loyal principles which actuate all our Settlement Officers would, I am fully persuaded, pervent any wilful deviation from the instructions laid down by competent authority. But where theories are strongly held, they often insensibly influence the course of action, and lead unconsciously to interpretations and inferences in accordance with those theories.

I think, therefore, that there is a necessity at the present moment for recalling the attention of Settlement Officers to the principles that have been affirmed, and practice enjoined by the supreme authority. On a question like that of a permanent settlement, on which a balance must be struck between opposing sets of advantages and disadvantages, there is of course room for every shade of personal opinion; and the expediency of the measure has, in point of fact, been more discussed for the last 50 or 60 years, than perhaps any other large question connected with the land revenue of India. When the subject came finally before the Home and Indian Governments, every argument that could be urged for or against the measure was before them and was duly weighed; and the decision was definitively come to that, under certain conditions, a permanent settlement should be conceded. That decision has been pronounced by the supreme authority, and has been with every formality promulgated. It is no longer a matter of individual opinion, the merits and expediency of which are open to question or to discussion in official reports.

The broad principle has been laid down that the revenue is to be settled in perpetuity, wherever the uncultivated portion of the cultivable area is less than 20 per cent., with this condition that, where there is any prospect of fresh canal irrigation producing an increase of above 20 per cent. in the assets, there permanency is to be withheld.

The measure is of course not applicable to secluded and backward districts, with a poor and rudimental standard of agriculture. But, with this exception, the directions on the subject are absolute, and are not to be weakened by the application of any theory of future development.

The two points on which I have found the practice in danger of being influenced by theory are, expected improvement from wells, and expected rise of rent.

On the first point, for instance, it is held in reference to a village or circle of villages that wells might be sunk and from them irrigation be drawn for considerable areas now wanting it; that heavier and more valuable crops would thus be secured and the assets improved. And it has been argued that, if a permanent settlement be held back because of possible improvement from canal irrigation, it should equally be so here.

The cases, however, are entirely different. In canal irrigation the benefit is brought to the proprietor at little or no expense of capital and labour on his part. It is reasonable, therefore, that just as provision is made for taxing any addition of area from alluvial increment, so provision should be made for laying under contribution an increase of produce equally arising from causes independent of the proprietor.

Moreover, it was with the very object of stimulating proprietors to expend labor and capital in the construction of wells and such like improvements, that the boon of a permanent settlement has been offered. If we are to wait indefinitely till every estate has reached or nearly reached its maximum powers of production, the avowed reasons on which the measure has been determined will be materially affected. Capital will not be expended on improvements, the fruit of which is to be swept into the Imperial treasury. It is by guaranteeing the benefits from the increased application of capital, skill, and labor to the proprietor that great and rapid improvement is anticipated.

Settlement Officers are, therefore, not to decline a permanent settlement to an estate that is otherwise up to the standard, simply because it is backward in the matter of wells or other requisites of high agriculture.

Neither are they to be influenced by any expectation of a future rise of rent. No doubt the tendency of rent will be to rise; but this contingency has been fully taken into account in striking the balance between the advantages of a permanent and a temporary settlement, and the judgment has been deliberately arrived at that the settlement shall nevertheless be perpetual. It has been indeed avowed by the Viceroy, as one of the arguments in favor of the measure, that the incidence of the land revenue, which, in His Excellency's opinion, is now quite sufficiently high, would eventually become under such influences lighter. We are taking in our present settlements a clear proportion of 55 per cent. of the assets; and when in addition to this the various village and incidental expenses and risks are borne in mind, the wisdom of the above view will hardly be disputed.

I am speaking of course of arguments based on the general rise of rent. Where the rents of individual villages are found to be below the prevailing rates of the pergunnah or vicinity, there the case must be decided upon its own merits. I have adverted to the subject in my Minute on the settlement of Mozuffernugger. If there be no sufficient reason for the difference, then the settlement should ordinarily be concluded upon an adequate estimate of what the rental should be, only great care will be necessary that the proceeding is based upon clear and undoubted evidence. And here, as in all other questions of the kind, the doubt must be given, as far as may be reasonable, in favor of the people. But if from this or any other cause the Settlement Officer feels that he cannot assess a demand adequate and sufficient with reference to the prevailing scale of rent, it will be his duty to notice the circumstance and to recommend that, although in all other points the estate meets the requirements of the standing rules for a permanent settlement, yet he has been forced to admit a lower assessment. It will then be for the consideration of the Board and Government, on a review of the causes of the inadequacy, to determine whether the settlement shall be permanent or temporary.

I have thought that the time is opportune for recalling the attention of officers engaged in settlement to these principles, and I am fully assured that the Government may implicitly look to all engaged in this great work that they will fully and loyally carry them into effect.

W. MUIR.

The 6th June 1868.

ORDERED, that 100 copies of the above resolution be forwarded to the Board of Revenue for distribution among the various Commissioners and officers engaged in settlement.

No. 269, dated Simla, the 17th May 1869.

From—J. GEOGHEGAN, Esq., Under Secy. to the Govt. of India, Home Dept.
To—The Secretary to Government of the N. W. Provinces.

I am directed to acknowledge the receipt of your letter No. 280, dated the 20th February last, submitting a copy of a Minute by His Honor the Lieutenant Governor on the rates for the assessment of Pergunnah Baghput, Zillah Meerut, proposed by the Settlement Officer.

2. In reply, I am directed to request that a copy of the correspondence on the subject with the Board of Revenue and of the report of the Settlement Officer referred to in the Lieutenant Governor's Minute, may be submitted, as the information now before the Government of India, in regard to the circumstances of this case, is hardly sufficient to enable the Governor General in Council to pass orders on it.

No. 1232, dated Allahabad, the 8th June 1869.

From—R. SIMSON, Esq., Secy. to Govt. of the N. W. Provinces,
To—The Secretary to the Government of India, Home Dept.

From Secretary to the Board of Revenue, No. 968, dated 26th November 1868.
From Commissioner, Meerut, docket No. 568, dated 12th October 1868.
From Collector, Meerut, memorandum, dated 18th September 1868.
Note by Secretary, dated 9th December 1868.

With reference to your letter No. 269 of the 17th ultimo, I am directed to forward copies of the papers noted in the margin, and to explain that they were not previously sent through inadvertence.

No. 968, dated Allahabad, the 26th November 1868.

From—W. C. PLOWDEN, Esq., Secy. to the Board of Revenue, N. W. P.,
To—The Secretary to Government of the N. W. Provinces.

I am directed by the Board of Revenue to submit, for the consideration and orders of the Hon'ble the Lieutenant Governor, a docket from the Commissioner of the Meerut Division, No. 568, dated 12th October 1868, and its enclosures, regarding the settlement of Pergunnah Baghput in Zillah Meerut.

2. The Board approve of the rates proposed by Mr. Forbes; but with reference to his proposal* for the permanent settlement of a portion of the pergunnah, I am to submit the following remarks.

* *Vide* paragraphs 26 and 27 of his memorandum.

3. Permanent assessment is to be granted to every village that fulfils the condition laid down by Government with regard to cultivation and irrigation. The boon is not granted to tracts of country, but every estate stands or falls on its own merits.

4. In this pergunnah it would appear from Mr. Forbes' report that the villages may be divided into three classes,—

1*st*.—Villages that fulfil the conditions laid down, and which can pay the full jummas demandable from them.
2*nd*.—Villages that fulfil the conditions regarding permanent assessment, but whose jummas cannot be at once raised to the full standard.
3*rd*.—Villages that do not come up to the standard entitling them to permanent settlement.

5. The villages of the 1st class should be permanently assessed.

6. The villages coming under the 2nd class should be assessed permanently at their full jummas; but as the payment of the full demand might press heavily on the malgoozars, who, under the former settlement, may have been paying a jumma cent. per cent. lower than that which the assets of the estate entitle the Government now to demand, a certain amount of the increased jumma should be remitted for a certain number of years, as the Settlement Officer may think necessary.

The 3rd class of villages will not be permanently settled. Should His Honor approve of the views now expressed by the Board, a copy of these remarks will be communicated to the Settlement Officer for his guidance.

No. 568, dated Allahabad, the 12th October 1868.

Memo. from—The Commissioner of Meerut, Division,
To—The Secretary to the Board of Revenue, N. W. Provinces.

In continuation of previous correspondence ending with Commissioner's No. 499, dated 25th August last, forwards comparative statement* and memorandum, and recommends the rates for approval, but draws attention to paragraphs 26 and 27.

Dated the 18th September 1868.

Memo.—By W. A. FORBES, Esq., Collector and Superintendent of Settlement.

Pergunnah Baghput is situated to the west of the Meerut District, is bounded on the west and east by the rivers Jumna and Hindun; on the south by the Lonee Pergunnah; and on the north by those of Kotana, Barote, and Burnawa.

2. These three pergunnahs, with that of Chuprowlee, still farther to the north, are, as regards soils, the richest in the whole district, and the part of Baghput nearest to them partakes of the same quality of soil; but to the south it gradually loses that character for wonderful fertility which the dark soil, resembling garden mould, of the estates higher up enjoys, and shades away at last into the ordinary soils of the district, fertile and highly cultivated under a plentiful supply of irrigation, but without any distinctive qualities.

3. As usual, where rivers form the boundaries, those estates which lie on the edge of the "bangur," or highlands above the valleys, are inferior to those more happily situated inland; they always have high "dry" lands between the canal-irrigated and the "khadir" or river-valley tracts, too high for the ordinary canal levels, and without capability for well-sinking. They are often, however, compensated in a great measure for this drawback by the extreme fertility of the sloping lands leading from the "bangur" to the lower "khadir." Just below the former, wells are easy of construction, and from the slope of the land each well irrigates a larger area. We here view with admiration the rich crops of cane, cotton, tobacco and wheat. When such villages are owned or cultivated by Jâts, they throw their whole energies into these lands, and leave the higher unirrigated fields for their khureef, ready always under favorable circumstances for a second crop in the rubbee.

* Not printed.

4. The Eastern Jumna Canal runs down the centre of the pergunnah throughout its entire length, and spreads its irrigation on either side up to the farthest point that the high levels just adverted to will admit.

For richness of products, high farming, and general prosperous condition of its people, these inland estates are not to be surpassed.

5. *Former condition.*—The improvement which has taken place in this pergunnah during the term of the past settlement, and without doubt chiefly owing to the extension of the canal irrigation system, is very remarkable. Thus we find—

		Acres.		Acres.
Cultivated area ...	Old Settlement	73,506	Increase ...	24,863
	Present „	98,369		
Irrigated area ...	Old „	12,623	Increase ...	46,981
	Present „	59,064		

It appears from the report of the late Sir H. Elliott, dated 1837, that the influence of the canal was then beginning to make itself felt, but unfortunately the information obtained from the report is too limited as regards this pergunnah to afford any basis for a close comparison. The area above given as under irrigation at last settlement is obtained from the vernacular records, and unless I saw it in black and white, I should be inclined to doubt that it was so small in extent.

6. Sir H. Elliott speaks of the opening of the Doab Canal having lately caused "a very large quantity of land" to be brought under cultivation; but when such is the result of the canal being opened, irrigation naturally accompanies the increased cultivation.

It is just possible that the extent of the irrigated area was concealed in some way from the Settlement Officer, or the people were holding back until the assessment operations should have been concluded; but with the splendid capability for wells, which nine-tenths of the estates enjoyed and still enjoy, I should have looked for more than 12,623 acres under "well" irrigation alone.

7. However this may be, we must, without knowing why, suppose that Baghput Pergunnah, for some reason or other, was found in a more backward condition than its neighbours to the north, and in certain respects—in the rates of prevailing rents for instance—it is so now; but its actual condition as regards cultivation, irrigation and development of qualities has reached the highest standard.

8. *Irrigation.*—The present irrigation is thus shown:—In the revenue-paying estates there are 596 masonry and 809 earthen wells; total, 1,405; and they irrigate 22,938 acres.

Besides these, there are 32 wells out of repair, and 43 existing and in repair, but disused by reason of the canal. How many earthen wells have shared the same fate and disappeared entirely, it is impossible to say; but the above return proves that the introduction of the canal has not dampened enterprize on the part of an active energetic population. It has pushed aside "well" irrigation from its own domain, but only to encourage it to flourish beyond. We find 1,288 acres irrigated from tanks, and the remaining large area of 34,838 is under canal.

9. It is not probable that canal irrigation will be extended to any extent, and we may only look for outlay of capital in well-sinking to increase the "wet" area. I must say, however, I should like to see a *judicious* reduction of the water allowance given to some of the more northern estates and those over the border in Mozuffernuggur, and the water carried a little farther down; but perhaps, if this could be effected, it would be better to carry the surplus water across the Kirshunnee Nuddee, high above the Meerut boundary.

10. *Character and caste of people.*—In the northern pergunnahs, nearest the point where they first entered the district, we find the Jâts predominate; in fact they may be said to be sole masters of Chuprowlee, Darote, Kotana, and the upper portion of Burnawa. Then in Baghput, as we come south, we find them still numerous, but not to the exclusion of other castes, and the older settled communities (the Brahmins, Tagas and Aheers) still maintain their hold on little clusters of villages.

The Jâts hold 32 estates in sole proprietary right, and shares in 19 others. They also hold one revenue-free estate.

The Tagas own full and sole rights in 20, and shares in 14 estates.

The Aheers are found to be full proprietors in 18, and part-owners in 6.

The Brahmins hold 10 whole estates, and shares in 24.

The Rajpoots (Hindoo and Mahomedan) own to themselves 11 estates, and claim shares in 15.

11. The cultivating classes are found in the same proportion.

The Jâts cultivate entirely by themselves in 15 estates without any assistance from other classes, and in addition cultivate lands as proprietors or tenants with others in 45.

The other predominating classes of proprietors are not given to this exclusive system; thus the Tagas, who, as shown above, hold 20 entire estates, only cultivate their own lands without assistance in three, the Aheers in seven, the Brahmins in six, the Rajpoots in one.

12. There are two whole estates and a share in a third owned and cultivated by Goshaens, who having dropped the habits of their religious order, drive the plough and farm as highly as their Jât neighbours. As the latter told me, these ex-faqueers have thriven ever since they "filled their houses," that is, took wives to them.

13. As I have observed throughout the district, the mechanics and lowest castes, who in the olden day never thought of holding land, are found as landlords in this pergunnah, and we have a carpenter, a blacksmith, a butcher and a presser of oil in our list.

24. *Transfers.*—By reason of the exceedingly light assessment of last settlement, followed by an enormous increase of assets due to the canal, and the stimulus which it gave to agricultural prospects generally, it would have been extraordinary had land changed hands to any extent. Consequently we find that out of 123,677 acres, 9,365 acres were sold during the past 30 years, whilst 1,327 acres only were mortgaged.

All the leading classes appear to have held their own, buying and selling in equal proportions. The mahajuns, I am glad to observe, only purchased and gave money in mortgage on 737 acres, and they are found as well in our list of sellers.

15. *Changes of pergunnah limits.*—There were changes in the limits and extent of the pergunnah on two occasions, in 1841 and in 1852.

Starting with 165 villages and 166 estates, as noted in the margin, it gained six and lost five at the revision of boundaries in 1841, and thenceforward there were 166 villages and 167 estates.

Khalsa	...	155
Maâfee	...	10
		165

Then, again, in 1852 it gained two and lost 21, and was left with 147 villages and 148 estates.

Then, again, in 1852, it gained two and lost 21, and was left with 147 villages and 148 estates.

Twenty-two new estates have been formed by partition, and the number reduced by one union of estates. Nine of the revenue-free estates have been resumed, and we now have on our rolls 147 villages and 169 estates, as detailed in the marginal note.

Khalsa	...	146
Maâfee	...	1
		147

16. *Changes of revenue demand.*—Corresponding to the above alterations in limits and boundaries, there have been constant changes in the amount of the Government demand.

The original demand from the 155 revenue-paying estates was Rs. 1,52,298-12-0, and, including Rs. 15,165 assessed intermediately on the nine resumed estates after the last revision of boundaries, we left off with Rs. 1,43,045.

To this must be added and deducted as follows :—

Add ...	Resumed Maáfee plots	Rs.	5,208	12 0
	Alluvion	„	368	0 0
		Rs.	5,576	12 0
Deduct ...	Land taken up for public purposes ...	„	89	0 0
	Miscellaneous	„	312	0 0
		Rs.	401	0 0
	Balance of increase ...	„	5,175	12 0
	Leaving our present net jumma	„	1,48,220	12 0

17. *Rates and mode of assessment, past and present.*—Sir H. Elliott in his report, writing of the Baghput and Lonee Pergunnahs, tells us that "peculiar causes have always tended to keep these pergunnahs at an assessment below the proper standard : a combination has usually existed amongst the most influential men in them to keep down the Government demand and deter farmers from coming forward to engage for mouzahs which would have yielded large profits to those who could have retained quiet possession. The name which these pergunnahs have acquired in consequence makes even the tehseeldars of the district unwilling to be employed in their superintendence and control."

18. To us in the present day this sounds most extraordinary. It was written in 1837, and only proves what since then must have been the change throughout the country. I could understand it being said of the Lonee Pergunnah, which was just over the jumna opposite Delhi, over-shadowed, as it were, by Selimghur and its evil influences. The hangers-on of the decaying court looked upon Lonee as their quarry upon which they might prey.

But of Baghput I do not understand it. I cannot find the influential men or the traces of them. The Jâts are sometimes a difficult set to deal with, and there exist two very powerful but distinct bodies of them in the pergunnah,—the Dhakowlee and the Hisodah Jâts. Had they been troublesome, they might have been played against each other, and would certainly have been eager to have farmed the whole pergunnah between them at fair rates and feared no one.

19. However it was, we cannot discredit the fact that Sir H. Elliott found it a difficult pergunnah to fix a proper assessment upon; and as the result, we find the assessment so light that it is difficult to bring it up to the proper mark.

There is no apparent reason to suppose that it was more backward in its condition than its neighbours; 12,600 acres appeared a small irrigated area, but the adjacent pergunnah of Barote, which certainly is richer on the whole, and has greater capabilities, had only 14,900 acres under irrigation at the time of last settlement.

The several rates of assessment in adjacent pergunnahs as compared with Baghput were thus :—

	Rs.	A.	P.		
Barote ...	3	3	7¼	per cultivated area.	
Chuprowlee ...	3	5	2¼	„	„
Kotana ...	3	4	1½	„	„
Baghput ...	1	11	11	„	„
And subsequent resumptions and changes have reduced the rate to	1	8	1	„	„

When it is considered that, with the exception sometimes of the estates bordering on the rivers and on the southern boundary near Lonee Pergunnah, there is no very great perceptible difference in the soils, and that Kotana at least is in no way superior, having very poor estates along the Jumna river, it is very difficult to account for the falling off in the rates.

20. In the three pergunnahs compared above with Baghput, I have been able fairly to raise the Government demand, leaving the rate on cultivation below that of the last settlement, thus :—

	Old rate. Rs.	A.	P.	*New rate.* Rs.	A.	P.
Chuprowlee cultivation, acre rate ...	3	5	2¼	3	1	5½
Barote ditto ditto ...	3	3	7¼	2	14	5
Kotana ditto ditto ...	3	4	1½	2	12	1

and now I find myself with the difficult task before me of raising the revenue very heavily, and increasing the rate on cultivation to an extent which I dread. Had it not been for the strict rules laid down about permanent settlement, I would not have hesitated for a moment in recommending that the greater portion of the pergunnah—the richer portion, in fact—should have remained temporarily settled for another term.

21. Whenever the former assessment has been from any causes very far below the proper standard, or what now appears might have been taken as the proper standard, there is always danger in suddenly forcing it up.

Whether there were difficulties which we know not of in the way of enhancing rents, or whether the people were ignorant of the procedure, is doubtful, but the fact remains. We do not find that rents have, as a rule, changed; no doubt they have risen, but how and when we cannot trace; and all over the country, and especially in this pergunnah, we find the low rents of olden days when landlords were glad to entice in tenants at almost nominal rents in order to lighten their own burthen.

22. This is the chief cause for my having modified my opinion as regards the immediate advantage of an universal introduction of permanent settlement, more especially under the restricted rules laid down by the present Secretary of State. Those promulgated previously by the Governor General left a greater latitude, and would not have rendered necessary so great a sacrifice of Government revenue and trouble in the future I now look upon as inevitable.

23. Sir H. Elliott, for assessment purposes, divided the pergunnah into two classes,—one composing the estates between the Hindun and the canal, and the other those between the canal and the Jumna. The canal divided his two classes, and for these he had different rates :—

	Rs.	A.	P.		
Rent rates ...	4	0	0	irrigated.	On estates between Hindun and canal.
	2	5	0	unirrigated.	
Revenue rates ...	2	12	0	irrigated.	
	1	10	0	unirrigated.	
Rent rates ...	4	4	6	irrigated.	On estates between Jumna and canal.
	2	8	0	unirrigated.	
Revenue rates ...	3	0	0	irrigated.	
	1	12	0	unirrigated.	

We are not told the reasons for this distinction of classes, or what was the advantage supposed to be on the side of the latter estates.

24. Looking at them now, it would trouble any one to say in what respect the estates bordering on the Hindun differed from those on the Jumna; or, as regards the estates lying in land, those on the one side from those on the other of the canal.

Both have been brought under or excluded from the fertilizing influence of the canal, and therefore we may fairly assume that they have progressed towards improvement in the same proportion.

Consequently my two classes have been the estates bordering on the rivers and sandy, and those inland under influence of canal without inferior soils.

25. Taking the average of Sir H. Elliott's rates for each class of lands, and applying them to the irrigated and unirrigated areas of the villages then in the pergunnah assessed by him, the jumma should have been Rs. 1,35,649, whereas it was fixed at Rs. 1,24,902. Had the full estimated pergunnah rates been applied, we should have found the still light revenue rate of Rs. 1-14 per cultivated acre; but, as we have seen, the assessment rate fell to Rs. 1-11-11 per acre on cultivation, and subsequent resumptions and changes have brought that down to Rs. 1-8-1.

26. For the present assessment, although I am guided rather by existing rents, classifying estates and applying higher rent rates where I find them low, and reducing the demand where I find it above half the rental which rents applicable to the soils and condition would seem to imply, yet, as I have often remarked before in my notes on other pergunnahs, rates are worked out and deduced for irrigated and unirrigated on soils, and used by me as very useful checks.

In the present case, they fully confirm what I have asserted—the impossibility of assessing this pergunnah up to the proper mark.

The rent and revenue rates which, after close examination of village areas and comparison with rates of adjacent pergunnahs, I determined on, were per acre as follows:—

Irrigated.						Unirrigated.					
Rent.			*Revenue.*			*Rent.*			*Revenue.*		
Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
7	3	2	3	9	7	3	9	6	1	12	9
6	0	0	3	0	0	3	0	0	1	8	0
4	12	8	2	6	4	2	6	4	1	3	2
Average.						*Average.*					
6	0	0	3	0	0	3	0	0	1	8	0

with a general "bhoor" rent rate of four annas per cutcha beegah.

Roughly casting the demand on the pergunnah according to, and even below, the above, which are fair and easy rates prevailing in adjacent tracts and here and there in the pergunnah itself, I had estimated the proper revenue demand to be Rs. 2,45,922, giving a rate on cultivation of Rs. 2-8 per acre.

The deduced rates on soils give a demand	...	... Rs. 2,55,544
The same on irrigated and unirrigated ditto	...	... „ 2,57,909

with cultivation acre rates of Rs. 2-9-7 and Rs. 2-9-10½ respectively.

When re-distributing my estimated jumma back upon individual estates, village by village, I dare not go beyond Rs. 2,10,035, giving a cultivation acre rate of Rs. 2-2-1.

This gives an immediate increase to the Government revenue of Rs. 61,240 and I am positively certain that permanent assessment at that jumma will cause a loss to Government of Rs. 36,462.

27. It is not a prospective improvement that I here look to; it is due from the pergunnah as we find it, but, by reason of the backward state in which rents are found, it cannot now be taken without very great pressure on the agricultural community, both landlords and tenantry, and the danger of opposing a check to its present prosperity.

No. 161, dated 22nd March 1870.

Office memo. from—E. C. BAYLEY, Esq., Secy. to the Govt. of India, Home Dept.,
To—The Secretary to the Government of India, P. W. Department.

With reference to the communication marginally noted, the undersigned is directed to enquire whether, in the opinion of the Irrigation Branch of the Public Works Department, it can be confidently stated that the conditions laid down by the Secretary of State in regard to irrigation have been fulfilled in the Baghput Pergunnah, Zillah Meerut, *i. e.*, that there is no estate in the pergunnah "to which canal irrigation is likely to be extended within the next 20 years, and the existing assets of which would thereby be increased in the proportion of 20 per cent."

Endorsement to the Public Works Department, No. 282A, dated 21st May 1869, forwarding copy of a despatch from the Secretary of State to the Government of Madras, No. 7 of 8th April 1869.

No. 144 I, dated the 25th March 1870.

Memo. from—COL. J. C. ANDERSON, R. E., Offg. Dy. Secy. to the Govt. of India, P. W. Dept.,
To—The Secretary to the Government of India, Home Department.

In reply to Mr. Bayley's memorandum No. 161, dated the 22nd instant, the undersigned has the honor to state that, as the Eastern Jumna Canal runs through the heart of the Baghput Pergunnah, there must be various estates within it to which an extension of canal irrigation may be anticipated within the next 20 years.

No. 63A, dated Camp Bah, the 12th January 1870.

From—R. SIMPSON, Esq., Secy. to Govt. of the N. W. Provinces,
To—The Secretary to the Government of India, Home Dept.

I am directed to forward, for the consideration of His Excellency the Governor General in Council, the papers noted on the margin, having reference to the settlement of the Boolundshuhur District, which by inadvertence were not sent to you from Allahabad.

Minute by the Hon'ble the Lieutenant Governor, dated 14th December 1869, on the land revenue settlement of Boolundshuhur.
Minute (Confidential) on proceedings for revision of settlement in Boolundshuhur, dated 28th May 1868.
Resolution (Confidential) dated 7th May 1869.
Minute on the rates of assessment for Pergunnah Baghput, Zillah Meerut, dated 13th February 1869.
Report by Mr. C. Daniell, dated 24th July 1869.
Minute by the Board of Revenue, dated 20th September 1869.
Demi-official letter from Mr. R. G. Currie, dated 22nd November 1869.
Letter (Confidential) No. 463A, dated 28th December 1869, to Secretary to the Board of Revenue, North-Western Provinces.

2. I am to solicit the early orders of His Excellency in Council on the questions discussed in the Lieutenant Governor's Minute.

Minute by the Hon'ble the Lieutenant Governor, dated the 14th December 1869, on the Land Revenue Settlement of Boolundshuhur.

Read the following papers:—

Sudder Board of Revenue, North-Western Provinces, No. 1215, dated 5th November 1869.

Minute (Confidential) on proceedings for revision of settlement in Boolundshuhur, dated 28th May 1868.
Resolution (Confidential) dated 7th May 1869.
Minute on the rates of assessment for Pergunnah Baghput, Zillah Meerut, dated 13th February 1869.
Report by Mr. C. Daniell, dated 6th September 1869.
Minute by the Board of Revenue, dated 20th September 1869.
Demi-official letter from Mr. R. G. Currie, dated 22nd November 1869.

This settlement begun in 1858 was completed in 1865, in which year Mr. R. G. Currie revised the revenue in accordance with the first condition for permanent settlement prescribed by Her Majesty's Government (24th March 1865), *viz.*, that 80 per cent. of the area must be under cultivation.

2. In 1867, Sir Stafford Northcote affirmed finally the second condition (originally laid down by Earl de Grey, 17th March 1866), excluding from permanent settlement estates the assets of which are likely to be increased by 20 per

cent. within the next twenty years. Accordingly, in February 1868, Mr. Cairus Daniell commenced a second review of the settlement, so as to bring it into conformity with this condition.

3. Shortly after my assumption of the administration of these provinces, I took an early opportunity of visiting the Meerut Division, chiefly with the view of observing upon the spot the manner in which this review was being conducted in the several districts in which it had become necessary.

4. On that occasion I found reason to question the sufficiency of the revised assessment of Mozuffernugger,* and arrangements are now in progress for its revision.

* Minute dated 26th May 1868.

5. On somewhat similar (though less definite) grounds, doubts arose as to the adequacy of the revenue assessed on Boolundshuhur; and on 28th May† instructions were issued to Mr. Daniell "to enlarge his commission, and to require that he should make a general inquisition into the sufficiency of the assessment." The grounds of suspicion being still vague, and the necessity of revision uncertain, the instructions were treated as confidential.

† See Minute (Confidential) of that date.

6. In April following, Mr. Daniell submitted in person the result of his inquiries so far as they had then gone. Although extending over only a portion of the district, the data were held sufficient to warrant an opinion on the question at issue, and a decision as to the general course to be pursued. The presumption appeared established that the assessment was not fit for a perpetual settlement; but it was still a question whether there should be an immediate revision, or whether the assessment should not rather be confirmed for twenty or thirty years.

7. On these and other points Mr. Daniell was required to furnish a report‡ and the points chiefly requiring attention, with suggestions for their treatment, were laid down for his guidance.

‡ Resolution (Confidential) dated May 1869.

8. Questions of the greatest moment are raised by the report now submitted,§ and it becomes necessary to lay the whole case before the Governor General in Council.

§ Dated the 6th September 1869.

9. I would premise that the present is not a regular settlement report. The original settlement reports‖ being in the press are not before me. But enough is now submitted, I believe, to enable Government to determine the general course proper to be taken in reference to this settlement.

‖ By Messrs. C. Currie, G. H. Freeling, W. H. Lowe, and R. G. Currie.

10. The investigation held by Mr. Daniell has been chiefly in two pergunnahs, one open to canal irrigation, the other not. The year of enquiry (1867-68) was remarkably favorable in its fall of rain, and the area under canal irrigation was in consequence less by a sixth than that recorded at the original settlement. In the other pergunnah irrigation had increased about 20 per cent. by the sinking of temporary wells, but of the entire cultivated area there was an increase of only 2 per cent.

11. In these two pergunnahs the recorded or acknowledged rental was found to have increased by 19 per cent., and a full rental, according to Mr. Daniell's estimate of rent-rates, would give an increase of 26 per cent. in the proper rental over that assumed at the settlement as the basis of assessment. But this latter calculation is based on theory not altogether admitted by Mr. Currie, who holds that the moderation of his rates was counterbalanced by an enhanced classification of soils, a portion of the inferior being treated as superior.

12. Mr. Daniell finds his conclusions sustained generally by further examination in other quarters, and of the estates looked into, he has selected 78 in which the discrepancy between the demand and the rental is most glaring—the jumma being only 36 per cent. (omitting cesses) of the rental, and the rental being 28 per cent. in excess of that estimated at the settlement.

13. Applying to the whole district the lesson learned from a part, Mr. Daniell is of opinion that if a new settlement were now made, about two-thirds might be susceptible of increase, and that the revenue if now revised might thus be raised £18,000. Before settlement the demand on the whole district was £105,683; by the new settlement it stands at £123,353. Mr. Daniell thinks it could now be increased to £141,353.

14. The Board of Revenue estimate the possible increase at something less, or say £17,000.

15. Mr. R. Currie has impugned some of Mr. Daniell's strictures,* but his remarks tend rather to assert the sufficiency of his assessments in reference to the assets and data existing at the time of the settlement, than to assert their sufficiency in reference to present data and assets.

16. It may, therefore, be assumed that if a settlement were now to be made in reference to present rentals and the evidence now available as to assets, there would in all probability be an increase of about a lakh and three-quarters of rupees, more or less, *i. e.*, about 14 per cent., on the revised jumma.

17. Mr. Daniell has carefully traced and endeavoured to explain the causes of the real or apparent inadequacy of the assets at the time of settlement.

First, he thinks that the jummabundees or rent-rolls, filed by the proprietors, were too much relied on. Mr. Currie does not admit that they were.

Next, he believes that holdings cultivated by the proprietors were estimated at an inadequate rental. Mr. Currie contests this conclusion also.

Third (and in this there is no ground of doubt), rents have largely risen.

18. Mr. Currie, indeed, thinks that some portion of the increased assets of Mr. Daniell's test year is due to the extreme fertility of the season; wherever rents are taken in kind, the proprietor's share of the produce being above the average of ordinary years. But, however, this may have been the case, the enhancement of money rents is patent and unquestioned. The causes are not far to seek.

Some small portion may be set down to agricultural improvements, but evidently not much; the increase of cultivated area or well irrigation would account but for a limited part of the increased rental.

Second, there is the general tendency of rent to rise, owing to the advance in prices, stimulated also by the completion of a new assessment. It is surmised that when the settlement has been finally confirmed, a still further movement in this direction may be expected. It must not be lost sight of that the general prevalence of rents in kind, at customary shares by division or valuation, has had a tendency to stereotype rates and to prevent the rise of money rents; and this was no doubt a potent cause of long depression of the rates of rent which prevailed in this district, notwithstanding its populousness, prosperity, and situation in the high lines of commerce.

19. Moreover, as pointed out by Mr. Currie, the conversion of money rents into rents in kind—an operation largely carried out by that officer—was a matter of great difficulty, especially in tracts where no money standard existed. The operation was generally managed by consent of parties, and the cultivator had to be conciliated as well as the proprietors. The standard assumed was probably even at the time low, and with the increasing tendency of rent to rise, it is not to be wondered that proprietors have since been able to raise the rents settled by Mr. Currie.

20. It may then be assumed that the difference between the assets, as estimated by the Settlement Officers and the assets as now found, arises mainly

* Mr. R. Currie's demi-official letter on Mr. Daniell's report is appended to these proceedings. I deemed it proper to give him an opportunity of explanation, but at the same time an averse to further discussion, which, under the circumstances, tends to become personal. Mr. Currie's present letter is purely demi-official, but it sufficiently indicates his views, and may be, therefore, recorded as such. No doubt if he had had the opportunity, he would have written a more elaborate explanation.

from an actual rise in rent; and such being the case, the several Settlement Officers are exonerated from negligence and indifference to the interests of Government. Indeed, their very names* preclude the supposition, all having been men of eminent ability and devotion to their work.

* Messrs. Charles and Robert Currie, Mr. G. H. Freeling and Mr. W. H. Lowe (the two latter deceased).

21. And before proceeding to consider what course is now proper to be pursued, it may be remarked that Settlement Officers, under the system of property prevailing in Northern India, must frame their assessments on the prevailing standard of rent. They are, indeed, bound in estimating the value of an estate to extend their enquiries in every direction, and to take into their account "the character of the people, the style of cultivation, the capability of improvement, the state of the market for produce, &c."† What Mr. Daniell styles "the imminent probability of immediate improvement" should form, and does in point of fact form, an element in the Settlement Officer's calculations, that is, expected improvement in the productive powers and value of an estate. But that is quite a different matter from basing an enhancement of demand on the theoretical basis of an expected general rise of rent. The measure of anticipated enhancement, or the certainty of any enhancement at all within any definite period, must, under such circumstances, rest on mere hypothesis; and such assessment upon speculative assets might seriously depress and injure the proprietary interest. It would, therefore, be dangerous to allow the assessing officer to leave the hard ground of current standard rents, and, speculating on an expected enhancement, to rate his assessments upon such expectation. There may, indeed, be cases (like that of Baghput, in the district of Meerut, already submitted to the Supreme Government) where the rates over limited tracts are, without any sufficient reason, lower than in adjacent places; and there the settlement may safely be made on an anticipated rise—a proceeding justified by the consideration that the current rents are actually below prevailing rates. But where over a whole district or large extent of country certain rates prevail, these must be held the prevailing rates, and their result the rental or "net assets" which form the basis of the Settlement Officer's assessment. And under ordinary circumstances (where at any rate a revision of assessment is not in immediate prospect), proprietors may be trusted from their self-interest to raise the rates as high as cultivating profits, limited by custom, will admit.

† Paragraph 53, *et seq.*, of directions to Settlement Officers.

22. I am not prepared to say that the assessment of Boolundshuhur, even on the data available at the formation of the settlement, might not have been pitched somewhat higher without any departure from the system under which our settlements are framed; but supposing some inadequacy of this nature to have existed, it would not have assumed dimensions sufficient probably to call the settlement in question, excepting for the intermediate rise in the rates of rent.

23. It remains now to consider what course is proper to be pursued in reference to this settlement.

24. The district is one the greater part of which, under the conditions promulgated by Her Majesty's Government, is open to settlement in perpetuity; that is to say, it is so advanced in cultivation, and developed as to canal irrigation, that the greater part of the estates answers the first rule of having four-fifths of their area under cultivation; and also the second, of there being no prospect of improvement by canal irrigation over 20 per cent. of present income.

25. It is very evident, however, that the demand now assessed, whether adequate or not at the time the settlement was made, could not possibly be confirmed in perpetuity. The Government is prepared for a certain prospective loss in consideration of a permanent settlement, and to forego its share of the future increased assets which, it may be presumed, will be in great measure due to the capital and labor invested on the faith of a demand limited in perpetuity. In

short, Her Majesty's Government have held out the prospect of a permanent settlement to the people of these provinces, but only at an adequate and fully assessed revenue. In the present case none of these considerations present themselves. Even supposing the demand to have been at first correctly framed on "existing assets," those assets (or rather the produce on which they are based) have not improved, or improved only in a very small degree. The fact is that the share of the cultivator, according to the usage of the district at the time of settlement, was too large, and the share of the proprietor (*i. e.*, the rent) too low. The rental has thus risen in consequence of previous inadequacy, partly also because of continuing rise in prices, but not because of the expenditure of labor and capital under the prospect of a permanent settlement. It is clear, therefore, that this assessment cannot be settled in perpetuity. There is no ground that could be urged in consonance with the spirit of a permanent settlement that would warrant the relinquishment of the 14 per cent. additional, which it is strongly to be presumed the district might at the present moment bear.

26. The question next arises whether (1) the settlement should be set aside and a more adequate one made of the whole district; or whether (2) a partial revision of the estates most inadequately assessed should be made; or (3) whether the present settlement should not be confirmed for a term of years, either 30 years, the term originally proposed, or any shorter period.

27. Against a completely new settlement, so far as its suitability for confirmation in perpetuity is concerned, there is this to be said that, from what has occurred since the formation of the present settlement, it may be assumed that the district as regards rent is in a transition state. If a new settlement were at the present moment made fully equal to the "existing assets," that is, to the rental now collected by the proprietors, in a few years what has occurred would be again repeated. The rental (apart from all expenditure of labor and capital) will have by that time increased largely; and if a permanent settlement were now made, a loss would be sustained of a nature and from causes not contemplated by Government in laying down the principles of a permanent settlement. But there is reason to anticipate that in the course of a few years the upward movement of rent now begun will have extended over the whole district and completed itself; that is to say, that proprietors emancipated from the conservative influence of rent in kind will have pushed their standard of rent as high as the tenantry will bear it, and that future enhancement afterwards will depend mainly on improvement from expenditure of labor and capital or rise in prices. The permanent settlement might then be introduced without any departure from the spirit in which it has been conceived and promised.

28. In reference to the Doab generally, there is also this additional consideration that the final distribution of the water of the Ganges Canal is yet unsettled; and although under the new canal system it is probable that their will be a provision for adjusting the proprietary rate of revenue demand to the variations of canal irrigation, yet such adjustment would but partially reach the profits from irrigation; and it would on all accounts be better if the permanent settlement could be deferred until the system of canal distribution were complete. On all these grounds I believe that it would not be expedient, at the present moment, to make a new settlement of Boolundshuhur with a view to perpetuity.

29. And similar grounds exist against making a new settlement for a term of years.

There are also these considerations:

Settlement proceedings have, in consequence of the repeated change of rules in reference to the permanent settlement, been now in operation, more or less, for ten years in this district. The uncertainty consequent on this state of things cannot but have kept people's minds in a most unsettled state, and prevented their devoting themselves, in the certainty of reaping the results,

to the improvement of their lands by the investment of labor and capital. Any revision of settlement which would prolong this harassing condition is much to be deprecated. It is most desirable that this long period of excitement and doubt should be brought to a close, and energy and application of capital and labor again fostered by the confirmation of the settlement.

30. A further reason, though not an imperative or conclusive one, is that the assessment has now been allowed to stand for so many years that expectations have been raised as to its permanency at least for the original term of 30 years for which it was at first proposed. It is true that on two separate occasions re-settlement inquiries have been set on foot; but these have been avowedly with the view not to questioning the assessments, but rather of *fitting them for confirmation in prepetuity*. Nearly a third of the 30 years' term has thus elapsed, and natural expectations have been created, property (including confiscated) has changed hands at prices based on the anticipation, and improvements have, no doubt, to some extent entered upon in the confidence thus created.

31. Indeed, one of the strongest objections to a revision turns, perhaps, on this latter consideration; for we should be open to the imputation of first forming a settlement for 30 years, and then holding off confirmation until the labor and capital expended in the implied faith of the prolonged settlement had improved the assets, and in the end of stepping in to tax such improvement. I do not say that there would be much ground for the imputation, but it is one of which even the appearance should be avoided, as it would engender suspicion and distrust of our good faith. These imputations might, perhaps, to some extent be avoided by instructing the revising officer to exclude from taxation profits arising out of such improvements; but it is notoriously difficult to separate and distinguish the profits due to improvements of this nature; and whatever care were taken, it is probable that the popular impression would be against us.

32. Mr. Daniell has mentioned, but not recommended, a middle course of partial revision. This course, if largely pursued, would be open to the same objections, without bringing in an equal increase of revenue. It would also be in the main confined to those proprietors who, putting faith in Government, had done their best since the settlement to improve their estates and raise their rentals; whereas it would leave untouched the more astute and suspicious landlords who are delaying improvement of their rental till the settlement shall have been finally confirmed. I am not, therefore, in favor of the proposal. But it has this to recommend it that it might be carried through in a summary manner by Mr. Robertson within the next six or eight months, and is, therefore, less objectionable than a general revision.

33. At the same time when the settlement comes to be taken up in detail, it is quite possible that there may be cases of manifest inadequacy in which the circumstances may justify an enhancement, as in Jarcha, Deorola, and Sarora (paragraph 69); and for this end Mr. Robertson should be prepared with a list of all such cases, in order that the propriety of an increase may be considered by myself in company with the Board while encamped in the district. I do not, however, anticipate that the cases will be very numerous in which, under the principles I have advocated, an enhancement will be found expedient.

In respect of the term of the settlement, there might have been an advantage in confining it to 20 years, which would make it conclude in 1286 Fuslee, or 1878-79, and enable the Exchequer earlier to assert its claim to a more adequate revenue; but it seems doubtful whether so short a term would admit of the full development of rents, as a complete and satisfactory basis for a permanent settlement or even for a temporary settlement for a long term. The full period of 30 years will expire in 1888-89, leaving a secure limitation of the Government demand for little more than 18 years from the present time,—a

term sufficient, but not too long, to draw out the energies of the agriculturists and develop a full rental.

35. Such is a statement of my views on the various questions raised. But before proceeding to any final step, it is necessary that the Governor General in Council be consulted in respect of this settlement, because, under standing orders, a considerable portion of the district should have been settled in perpetuity. The two conditions laid down by Her Majesty's Government for a permanent settlement have been fulfilled. The required limit of area under cultivation has been attained; the required extension of irrigation and development of resources fully secured. The "existing assets," if we look only to the produce of the soil, are every way sufficient; but the "existing assets" which reach the proprietor in the shape of rent are as yet inadequate, and when the assessment was framed were still more so.

36. The sacrifice of revenue under a permanent settlement would be gratuitous and indefensible, for the increase of income to the proprietor would not represent the profit of capital invested on the faith of such settlement, but the mere assertion by the proprietor of a larger and more legitimate share in already existing assets; and under these circumstances it becomes my duty to ask His Excellency in Council to sanction a deferment of the measure, and to authorize me instead to treat the assessment on the basis of a temporary settlement.

37. The lesson may also fairly be learned from the history of this settlement that the two conditions enjoined by Her Majesty's Government for a permanent settlement are not sufficient. I do not here advert to the policy itself of making settlements in prepetuity; that policy has been definitively adopted by Her Majesty's Government, and announced, if not promised, to the people; and I should not even, had I not myself concurred in the policy, have felt at liberty to question it on the present occasion. It is evident, however, that the sacrifice to which Government, in conceding a permanent settlement, has consented is one of future revenue from improvements accelerated by the increased investment of capital by proprietors when secure of the whole result. But in the case of a settlement like the present, based on an imperfectly developed rental, the sacrifice would be of future revenue, created by no such expenditure, but simply by the exertion of proprietary power in increasing the relative share of the produce which constitutes rent. This is a process which in the nature of things will come to pass equally, whether the settlement be in perpetuity or for a term, and the sacrifice would be consequently gratuitous, made without any corresponding object of return.

38. I think, therefore, that a third condition for permanent settlement is thus shown to be quite necessary, namely, evidence that the standard of rent prevalent, or the estimate of "net produce" on which the assessments are based, is adequate; or (having due regard to soil facilities of irrigation and ratio of dry and wet land) is not below the level of rent throughout the country at large.

39. How far this condition will affect the claim of other settlements in these Provinces to be made permanent, I am unable at present to say. It may, perhaps, be possible to lay down some standard of average rates below which no settlement shall be confirmed in perpetuity. Certainly, judged by this standard, the rates of the Meerut Division generally would appear inadequate, being greatly below those of Furruckabad, a district possessing no

	RATES OF			
	Old Assessment.		Revised Assessment.	
	Culturable.	Cultivated.	Culturable.	Cultivated.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Saharunpore ...	1 3 9	1 8 4	1 5 7	1 11 1
Mozuffernugger ...	1 5 6	1 10 10	1 5 1	1 11 6
Meerut	1 6 7	1 11 11	1 10 9	2 1 1
Boolundshuhur ...	1 3 8	1 7 8	1 3 8	1 10 3
Furruckabad ...	1 8 8	2 0 3	1 11 11	2 11 4

special advantages over it. The subject will be commended to the consideration of the Revenue Board.

40. It might also meet some of the objections currently urged against a permanent settlement, without affecting the virtue of the principle, if power were reserved at any future period after the lapse of say 30 or 50 years, on its being proved that the price of agricultural produce had increased since the settlement by more than say ten per cent., to make a rateable enhancement of the revenue. If such power were exercised only by the Legislature, or by ordinance of the Governor General in Council, the confidence of the people in the perpetuity of a demand, liable only to rateable increase under certain known conditions, would not be impaired. If care is taken that no settlement be confirmed in perpetuity unless upon adequate rates of rent, and with such a condition as to rateable increase in proportion to increase of prices, the sacrifice of revenue would be mainly limited to what is legitimate, namely, the relinquishment of a share in the profits hereafter created by the investment of labor and capital.

41. Other matters in connection with this settlement will be taken up in correspondence with the Board. The present remarks are confined to what is necessary to bring the question for decision by the Right Hon'ble the Governor General in Council fully before the Supreme Government.

42. And early orders are solicited from His Excellency.

ALLAHABAD;
The 22nd December 1869.

W. MUIR.

[CONFIDENTIAL.]

Minute by His Honor the Lieutenant Governor, North-Western Provinces, regarding the Proceedings for revision of settlement in Boolundshuhur,—dated Allahabad, the 28th May 1868.

Mr. Daniell drew out the accompanying rough memorandum of points provisionally settled at the conference held at Boolundshuhur on my late visit to that station. A copy will be sent to the Board for information.

2. The work is proceeding in accordance with existing instructions, and the estimate of lands open to future irrigation appears to be supplied, as well as the circumstances admit, by Lieutenant Marindin. It is, after all, only an approximate estimate that can be given; but in any special case of doubt, the Collector was instructed to refer again to the canal officer, who in that event is prepared to go into the irrigational capabilities of the estate in full detail, or in reference to any particular point of inquiry.

3. Nothing further than this would have been necessary. But the evidence subsequently brought to light in respect of the inadequacy of the assessment of some parts of Mozuffernugger suggests the doubt whether the same may not possibly be the case in Boolundshuhur. On the one hand, the prevalence of money rates in Boolundshuhur afforded the Settlement Officer a more sure criterion of the assets, and rendered the chances of inadequate assessment less than in Mozuffernugger. On the other hand, Mr. Forbes, who, as Collector of the adjoining District of Meerut, every way similarly situated to Boolundshuhur, is in the best possible position, both from personal observation and from hearing the views of the people, to form an *outside* opinion, stated his general impression that Boolundshuhur was to some extent inadequately assessed. Too much stress must not, of course, be set upon opinions of this nature; but coming from the source they do, it is sufficient ground to pause and at least to adopt opportunities which at present offer for further inquiry.

4. Land has been selling at extravagant prices in Boolundshuhur; but though this is undoubtedly evidence generally of the profitable and popular character of the proprietorship of land in this district, I would not put too much stress on individual cases where the prices may have been run up by special causes unconnected with any peculiar lightness of assessment.

5. Mr. Daniell is at present restricted to a review of the settlement engagements in reference to the late orders of the Secretary of State on the subject of canal irrigation. He is further authorized to take up any glaring cases of inadequate assessment which may come to his notice in the course of his proceedings for the foregoing purpose; but he is not required or authorized to institute general inquiries into the adequacy of the assessment.

6. I think that, with reference to the foregoing remarks, it will be expedient to enlarge his commission and to require that he should make a general inquisition into the sufficiency of the assessment. I would not, however, hold him responsible for inquiring into the assets of *every* estate. I would rather lay down that he should look,—1*stly*, to the general indication furnished by the pressure of average rates on particular tracts as indicative of lightness or heaviness of incidence; and, 2*ndly*, to cases illustrative of over-assessment or otherwise, which, in his every-day work and in his other settlement proceedings connected with irrigation, will be brought to his view and that of Mr. Robertson; and that he should, as occasion offers, extend his inquiries, more especially in any quarter where the indications may be significant of undue lightness.

7. As several years have now elapsed since the assessment was fixed, large opportunities are no doubt available for the ascertainment of actual assets, and I see no reason why these should not be availed of in this inquiry.

8. I would not, however, subject to any inquisition, with the view of enhancement, improvements, and consequent increase of assets, created since the new settlement. Capital and labor have been expended on the implied faith of that settlement, and it would have a bad effect now to interpose and revise the assessment *simply* because of improvements made intermediately. But the fact of such improvements having taken place, and as therefore indicative of a degree of improvability not suspected by the Settlement Officer, might not unfairly be used as a reason for not conceding a permanent settle- at the jumma now proved inadequate.

9. As in the case of Moozuffernugger, I would add that it is not the object in view to take up cases where the supposed inadequacy is of trifling amount. It would clearly be inexpedient for any unimportant and petty sums to disturb a settlement already completed by the district officer.

10. In all his proceedings it is also of the first moment that the revising officer should study moderation, and, in case of doubt, give the doubt in favor of the zemindars.

11. I have every confidence in the judgment and capacity of Mr. Daniell for this work, and he has the aid of an able assistant in Mr. Robertson.

12. It might be advisable for Mr. Daniell to visit Mr. Forbes, and have in personal conference the benefit of his large experience in this question.

13. The contingency discussed in the present paper is still uncertain, and the views set forth are based on assumptions confessedly vague. It will, I think, therefore be proper at this stage of the matter to treat the present instructions as confidential, and not to disturb the minds of the landholders by making public possible intentions which it may after all not be found necessary to act upon.

W. MUIR.

Memorandum regarding settlement operations in Boolundshuhur, dated 12th May 1868.

Rule of 55 per cent. of the Jummabundee.

It is proposed to introduce this. The calculation will be made as follows:—

Find the jumma and charge 10 per cent. on that jumma, making the whole one lump demand, *e. g.*, Rs. 1,000 demand including cesses.

	Rs.	A.	P.
Deduct cesses at 2-4 per cent.	22	8	0
Net jumma Rs. 977-8-0; charge 10 per cent. on ...	977	8	0
=97-8-0; then total demand will be	1,075	0	0

But where the village now pays chowkeedaree of Rs. 36 say, the calculation will be made as follows :—

1,000÷22-8-0=977-8-0+(36÷2=) 18=995-8-0
10 per cent. on 995-8-0=99-8÷995-8-0+99-8-0=1,095-0-0

2. In introducing the terms of Act II, it is proposed that as the 55 per cent. rule will come into force, and as this forms a heavy demand upon the land, the terms of Act II be introduced as regards *non-agricultural* residents and tenants only, provided it be shown that the chowkeedaree requirements are fully met by the income to be realized by the regular cess as well as under Act II.

3. The returns given by the canal officer are to be considered as proper basis for forming conclusions. In cases where the Settlement Officer finds any subject of doubt, the case will be laid before the canal officer, and he will record his opinion. It is probable that the opinion given by the canal officer will be sufficient grounds for final action in the matter.

4. In cases in which temporary settlement was made, say at Rs. 500, and subsequently, on issue of the first permanent rules, the village was placed on the "russuddee" terms, say Rs. 500 initial and Rs. 550 7th year, and Rs. 600 14th and *permanent*, and in which village, when the "russuddee" system was set aside, a *permanent* jumma was fixed at Rs. 550, and where now, on account of increasing irrigation, the settlement can only be made *temporary*, the terminal settlement will, as a rule, be made on the initial jumma of Rs. 500. Exceptional causes, however, may be found for fixing the temporary jumma at the same sum as that proposed permanently, *viz.*, Rs. 550.

5. In all other cases where villages were settled permanently, and where it may be found necessary now to settle the same temporarily, the terminal jumma will be kept the same as was fixed for permanency.

6. In all cases only one jumma can be taken permanently without reference to the chance of Government disallowing the permanent settlement.

7. In cases such as those mentioned in paragraph 4, where Rs. 550 has been paid as permanent jumma for two or three years, and now Rs. 500 is fixed as temporary jumma, it is possible that proprietors may apply for refund of the extra Rs. 50 paid for two or three years. These cases will be collected and specially reported for orders.

8. The main work is in connection with the irrigation matter; but notice must be taken of all cases where it is seen that permanent jummas have been fixed contrary to the 80 per cent. of cultivation rule, as well as of any cases in which the settlements are greatly disproportionate to the asssets of villages at the time of settlement.

9. The figures in the Khewut only are to be altered,—the proprietary entries are to be kept intact as completed at the time of settlement.

C. A. DANIELL,
Offg. Collector.

[CONFIDENTIAL.]

Resolution by the Government of the North-Western Provinces, in the Revenue Department,—No. 1034, under date Allahabad, the 7th May 1869.

Read confidential Minute dated 28th May 1868, regarding the revision of settlement in Boolundshuhur.

In accordance with the above Minute, Mr. Daniell and his Assistant, Mr. Robertson, have been engaged in testing by local inquiry the sufficiency of the assessment of Boolundshuhur as fixed at the late revision.

Mr. Daniell being on leave took the opportunity of laying the result of his investigation, so far as it has gone, before the Board; and on the 20th ultimo, he explained personally to the Lieutenant Governor, at a conference with the Board, the general conclusions at which he has arrived.

Two pergunnahs* have been completely examined, and two others are in progress of examination. Mr. Daniell regarded these portions of the district to be amply adequate as tests of the general assessment of the district, and declared that, with the materials now in his possession, he was prepared to furnish a report which should conclusively establish in a general and approximate, but still for the purpose in hand in an amply sufficient, manner the inadequacy of the present assessment. It was determined, under these circumstances, that the investigation need not be prosecuted further, but that Mr. Daniell might at once report the result of his proceedings.

* Khoorja and Shikarpore.

Mr. Daniell has come to the conclusion that, judged by the existing standard of assessment, the revenue of the district is from 3½ to 4 lakhs of rupees short of a full moderate demand. The land revenue is about 11 lakhs, so that the deficiency, supposing the above estimate to be correct, is not short of one-third, or 33 per cent.

This is a sufficient reason, supposing the position to be satisfactorily made out, why the settlement should not be confirmed in perpetuity. But there will still remain for consideration a number of questions of the gravest moment, namely, whether the assessment is sufficient for confirmation even for a term of years, and if sufficient, whether that term should not be limited to 20 instead of 30 years, or whether the whole settlement should not be disallowed and a new one formed afresh. Various points connected with these alternatives will require to be studied. The settlement has now been in operation for a considerable number of years, and expectations have grown up in consequence; property has been purchased at advanced prices on the faith of these expectations; the operation of a land revenue settlement is harassing to the people; and it is for consideration whether, having gone through this operation, we should be justified in again subjecting the district to its unsettling influences, checking improvement, and inducing feelings of uncertainty and want of confidence in the treatment of the landholders by the Government. On the other hand, the claims of the Exchequer on this as on all other districts must not be lost sight of, and we must seek to strike the balance so as, in view of all these considerations, our action shall result upon the whole in that which is most expedient and equitable in reference to the various interests concerned.

In reporting the result of his enquiries, the Government will look to Mr. Daniell, the Commissioner, and the Board to furnish their views, in order that this weighty question may be decided with the full benefit of their judgment. The matter is all the more important, as the course taken may form a precedent for other similar cases, such as that of Mozuffernuggnr, where it is possible that the investigation now going forward may bring to light conditions somewhat analogous.

Mr. Daniell will submit his own and Mr. Robertson's detailed village notes in substantiation of his conclusions; but it will not be necessary to tabulate the details contained in these. It will be sufficient to give general results in his report. There are, however, many points which will bear essentially upon the course proper to be taken. They are such as these:

How far the present proprietary income, being in excess of what was assumed by the Settlement Officers, is the result of improvements effected since the settlement, either by the landlords or the tenants, in extended cultivation, sinking of wells, &c., or otherwise by extended canal irrigation.

The rise in rent should be traced to its several causes. Where due to the action of the Settlement Officer in the adjustment of rents judicially, it should be explained how far it has been the subject of subsequent modification by the parties themselves; how far otherwise the scale of rent has advanced by the action of the landlord; and, in either case, what distinction has prevailed in respect of enhancement between the hereditary cultivator and the tenant-at-will.

Is it possible to say how far the new assessments can be viewed as adequate, or otherwise, in reference to the resources of the district as they existed *at the time of settlement?*

It may be sufficient to indicate these, as some of the questions with which Mr. Daniell must be prepared to grapple, and on which such information as is available to him should be laid before the Government.

Connected with the future probabilities of a further rise in rent, it has been brought to notice that there has been entered in some of the administration papers stipulations that the rents, as fixed by the Settlement Officer, should continue unchanged for the term of settlement The Board have justly laid down that any such stipulations are wide of the duty of the Settlement Officer, and of the objects of the settlement record. These are to record prevailing rates and customs, not to forestall future action. It will be necessary now to disallow formally all such entries; and the simplest way, rather than to have an entire re-construction of the administration papers, will be to strike out and eraze all such entries, and thus to leave the future adjustment of the rent to the unfettered action of the landlord and tenant, subject to the restrictions and conditions of the law. Or if it be doubtful whether such erasure will cancel the obligation supposed to have been created by the former entry, then, perhaps, it should be cancelled by a formal and supplementary entry for each village.

This Resolution must be considered at the present stage to be, like the former, strictly confidential; but the Board may take open and formal action at once on the proposal contained in the last preceding paragraph, should they concur in the course therein proposed.

R. SIMSON,
Secy. to the Govt., N. W. P.

No. 1035.

ORDERED, that copy of this Resolution be forwarded to the Secretary to the Board of Revenue, North-Western Provinces, with the request that the Board will furnish a copy of it to the Commissioner of the Meerut Division, and a copy also to Mr. Daniell for his guidance.

Dated Moradabad, the 24th July 1869.

From—C. DANIELL, Esq., Collector in charge of the Boolundshuhur Settlement,
To—The Commissioner of Meerut Division.

In accordance with the instructions given in the Government Resolution No. 1035, dated 7th May (confidential), I have the honor to submit my report on the lately revised settlement of Boolundshuhur.

2. As directed in paragraph 7 of the letter, I beg to forward the detail village notes of the four pergunnahs of Khoorjah (part), Shikarpore, Anoopshuhur (part), and Dadri.*

3. Before taking up the subject from the point at which the operations now under report were started, I think it better to run briefly through the course pursued in forming the late revision of the settlement.

4. *Course of operations in the late revision of settlement.*—In 1858, Mr. Charles Currie commenced the revision of the settlement in the pergunnahs of Burrun and Agowta. During 1860, 1861, and part of 1862, Messrs. G. Freeling and W. Lowe held charge of the settlement, and under these officers, Mr. R. G. Currie worked as assistant. From the time of Mr. W. Lowe's death, in August

* These detailed statements are not printed.

1862,, until the settlement was closed, Mr. R. G. Currie held the charge of the office and finally reported on the settlement operations in April 1865.

5. From the commencement of the revision until 1864, the settlement was made for a term of years, to close with the year 1296 Fuslee, or 1890-91 A. D. During 1864, the first orders for the introduction of the permanent settlement were received, and Mr. R. G. Currie then introduced the system under those rules in the whole district during 1864 and two first months of 1865.

6. The rules at that time sanctioned the introduction of "progressive" settlement in villages whose areas of cultivation did not reach the proper standard. Subsequently, the revised orders appeared annulling progressive assessment; and all villages which had been settled on the progressive system, 368 in number, were re-assessed under Mr. Webster's supervision in 1865, and settled either permanently or temporarily, according to the will of the proprietors.

7. I shall have hereafter to revert to the above points, as the course through which the settlements were introduced in the several pergunnahs, during the years above mentioned, most materially affects my subject of report.

8. *Primary reasons for re-opening the settlement question in* 1868.—Settlement operations having lasted from 1858 to 1865 were then at rest until February 1868. In that month, the office opened under my superintendence, with Mr. J. G. Robertson as my assistant, for the purpose of carrying out the orders conveyed in the Sudder Board of Revenue circular No. 54, dated 27th November 1867; also, while the subject was re-opened, it was intended to take fresh agreements from the proprietors, calculated under the rules of circular No. 3, dated 13th June 1866, at 55 per cent. of the rent-rolls, which rules were issued subsequent to Mr. R. G. Currie's settlement.

9. *Origin of present examination.*—Early in May, His Honor the Lieutenant Governor visited the district, and all settlement matters came under discussion. On the ascertainment by His Honor, here and elsewhere, of the difference between the rates of rent prevailing in this district and those of other districts under revision of settlement, Sir William Muir issued directions to me to ascertain in the course of the work in hand, "how far the rates of settlement were pitched too low; that the jummas appeared to be generally very light; and that possibly the jummas did not represent their proper share of the real income of the villages."

10. In order to come, in the first instance, to a conclusion on the above points, as far as record evidence could be of use, I prepared with Mr. Robertson's assistance a full detail of every circumstance of area, rent-roll, irrigation, &c., of every village in the district from the time of settlement to the present year. These returns were prepared from settlement records, putwaree's papers, and investigations from canoongoes and others, and were intended to "form the basis of further investigations on the spot, in the event of its being found that the present assets differed materially from those of the settlement."

11. *Grounds on which local examination was directed.*—On the completion of these returns, the preparation of which occupied the office during the hot season, it was found that as far as the record gave evidence there were grounds for further action. Accordingly, with the sanction of the Lieutenant Governor, local examination was commenced in two pergunnahs (Khoorjah and Shikarpore) to ascertain the following points:—

1*st.*—Whether the record evidence was borne out by the facts found to exist at the time of examination of the villages?

2*nd.*—What would be approximately the annual loss to Government in consequence of the present low assessments, taking as example the state of the cases as found in the two pergunnahs under examination?

3*rd.*—What were the causes of increase of assets wherever such increase was found to have occurred?

12. Out of the pergunnah of Khoorjah, 69 villages, and the whole of Shikarpore, 85 villages, were carefully examined and reported on. The evidence found

in these cases was laid before the Board of Revenue and the Lieutenant Governor. The discussion on the subject resulted in the directions conveyed to me in the Government Resolution No. 1035* (confidential), dated 7th May 1869.

13. I may here note that three other pergunnahs had come under examination during the first three months of this year, and evidence from two of these will be used towards elucidating the main questions on which I have to report, and which will shortly be brought forward.

14. *Extent of local examination.*—There have been 460* (in all) villages examined. These have included lands of every description, and tenures of every sort. These have, by no means, been selected because they showed evidence of being settled on less adequate assets than other villages; on the contrary, the selections were made on very different grounds, namely, Khoorjah and Shikarpore were selected because in the one there was a large extent of canal-irrigation, and in the other there was no canal-irrigation at all. Khoorjah is a pergunnah of importance, which, while possessing every variety of soil, has several tracts of indifferent lands. Shikarpore is a pergunnah of mediocre standard, with various qualities of soil. Anoopshuhur I next selected, mainly because I desire to clear up by local examination several matters connected with the assessments which were brought to my notice by the Manager of the Court of Wards' estate of the Katyani family.

* Part Khoorjah	82
Shikarpore	85
Part of Anoopshuhur ...	68
Dadri	185
Part Dunkour...	40
	460

Dadri and Dunkour had already been partially examined by Mr. Robertson, with reference to the canal question; and out of the 225 villages examined in those pergunnahs, 125 are "Bhyachara," or otherwise unprovided with recorded rent-rolls.

15. My object has been to examine the different qualities of villages, not only to see how far present ascertainable assets differed from those of settlement, but to test in every varying way the more difficult points of enquiry which have grown to be part of the question under review.

16. *Nature of local examination.*—The examination into the above 460 villages has been very full and complete. Having at our disposal all the evidence procured at settlement, as well as all that office records or putwarees' papers could give us up to the present date, we had numerous details before us on which we had to pass sentence from local examination. I myself felt that the closest scrutiny was necessary in order that there could be no shadow of a doubt on any point which might be raised on the result of this inquiry; and I have every reason to believe that Mr. Robertson has been fully alive to the weight of his responsibility in the case in hand.

17. ***Results in Pergunnahs Khoorjah and Shikarpore.*—The 154 villages of Khoorjah and Shikarpore show the following results :—**

Pergunnah.	Approximate assets on which settlement was based.	Jumma (less cesses) of settlement.	Recorded assets of 1275 Fuslee.	Cultivated area of settlement.	Cultivated area in 1275 Fuslee.	Irrigated area at settlement.	Irrigated area in 1275 Fuslee.
Khoorjah	1,20,238	60,517	1,42,700	34,443	35,287	18,169	14,987
Shikarpore	1,15,162	57,583	1,37,500	36,237	36,803	13,171	15,973
Total ...	2,35,400	1,18,100	2,80,200	70,680	72,090	31,340	30,960

18. In fixing the "approximate assets of settlement," I have in nearly all the cases in Khoorjah found the average rent-rolls on which the settlement

* Printed with this report.

was based recorded in the remarks of the Settlement Officer. In Shikarpore, however, there were many cases in which the assets on which settlement was based were not shown at all. I therefore accepted, as a general rule, that the *nett* jumma represented (as it should do by the rules in force) 50 per cent. of the rent-roll. That portion, then, of the assets of settlement which are taken from Shikarpore, are put at double the jummas. This, I think, is perfectly fair way of dealing with the matter, and, in fact, is the only explanation which the Settlement Officer himself could give at this distance of time. The settlement jumma is the demand now taken, *less the minor cesses.*

The recorded assets of 1275 Fuslee are those which are written in the putwarees' books, and which were all collected in this year; but, as I will show hereafter, falling short of what by examination has been ascertained to be the real value of the lands for the year 1275 Fuslee.

19. The irrigation in Khoorjah fell off, because the year (1275 Fuslee) was a good rainy year. I put the proper irrigation of the villages under report at 20,000 acres.

The increased irrigation in Shikarpore has been the result of extension of new wells (mostly kutcha), and the repairing of old ones, since the settlement.

20. The assets of 1275 Fuslee represent actual collections in cash, either by differential rating, or by average or "sárásuree" rating, or by payment in fixed lump sums as well as collections in "kind" and by valuation of crops.

21. *Rent-rolls of* 1275 *Fuslee, and causes why they do not represent the full value of the land.*—I must now say a few words about the recorded rent-rolls of 1275 Fuslee, which become a subject of importance as touching my estimate of the value of the lands.

22. As a rule, in villages where rents are collected in money, whether by rating or by fixed sums, and where nearly all the land is cultivated by tenants, the recorded rent-rolls represent the *bonâ fide* demands and collections; but in villages where any considerable portion of the land is cultivated by any of the proprietary community, the portion of the rent-roll which contains the lands cultivated by any of the proprietors is below the proper standard, or, in other words, the recorded rent-roll of these lands is below the average rent of the lands tilled by tenants. This question, I may state, is quite apart from any cases in which proprietors may cultivate at "privileged" rates.

23. The matter may be shown thus, *e. g.*, tenants 300 acres, "seer" 100 acres, total 400 acres :—

Average rate per acre on 300 tenants, at Rs. 4
" " " 100 "seer," " 3 } Rate per acre, Rs. 3-12-0;

whereas, if the "seer" lands were rated according to the tenant's land, the rate would be at Rs. 4 throughout, *i. e.*, the rent-roll would be Rs. 1,600 instead of Rs. 1,500. I have given a moderate exemplar; but this state of things, when spread over a large number of villages, would materially affect the total rent-roll of a pergunnah.

24. I do not now discuss the point of whether the tenants have the good lands, or the "seer" lands are poor. These questions would be disposed of on examination of lands, and rates would be apportioned according to the quality of the lands; but whether good or bad lands are tilled by the proprietors, the recorded value of those lands is less, as a rule, than would have been the case had these lands been cultivated by tenants. I can refer to one good instance in the Khoorjah Pergunnah, *viz.*, Mouzah Deoralah.

25. There are also other cases which came to light by local examination, and which otherwise would probably lie hidden—cases in which the zemindars, knowing that they have secured light jummas, have kept their lands and assets in much the same state as they are shown to be at settlement, but in which, directly the settlement receives the Government sanction, great improvement will be made.

In such cases it is probable, however, that the error is not to be found so much in the "rating" as in losing sight of the imminent probability of immediate improvement. Other villages there are, too, which, while bearing ordinary rating, are in reality capable of bearing much more from exceptional causes, which do not appear from paper examination. As an example of the above cases, I may mention Surora in Anoopshuhur Pergunnah, and the two Jurcha mehals in Dadri Pergunnah.

26. *Estimate of present value of lands.*—In entering into the next cause of inadequacy of rent-roll, I am treading on ground which occupies a prominent position in the field of the present enquiry, namely, "what is the proper value of the lands, as I find them, in comparison with the value set upon them at the time of settlement?" This point is one which will be referred to later, and be more prominently used in summing up the case under report. I speak just now only as regards the villages under review.

27. While testing the actual recorded and unrecorded assets of the villages, I have also prepared estimates of what should, in my opinion, be the *proper* assets of the villages. In the case of the villages examined by myself, and those examined by Mr. Robertson, the system has been the same.

The estimated value is based not on improbable grounds, but on actually existing facts. From the facts before us, we have drawn a standard value, and have brought a considerable number of villages which bore places at the bottom of the list up to a proper position. The result has, of course, increased the "average rates," and consequently "the gross rentals" of the pergunnahs.

28. The average rates which I believe the above villages can fairly bear, are at Rs. 15, Rs. 5, and Rs. 2-4-0 per acre, for the three denominations of soil, *i. e.*, "Barah" lands, "outlying irrigated," and "outlying unirrigated;" while the average rates of settlement were set at Rs. 12, Rs. 4, and Rs. 2. According to the estimated rates, the rent-rolls would show considerable increase over those of 1275 Fuslee, as follows:—

	Rs.
Estimated rent-roll	2,98,000
Total 1275 Fuslee	2,80,200
While that of settlement was	2,35,100

The above estimated rent-roll is, however, calculated on the present cultivated area, and might be subject to some slight reduction according to the increase of cultivation; but the foundation on which this estimated rent-roll is based stands good, that is, the average rating at Rs. 15, Rs. 5, and Rs. 2-4-0, takes the place of the settlement rating of Rs. 12, Rs. 4, and Rs. 2. The difference really to look at is between the figures of settlement and those of the present estimate.

29. *Showing how in certain cases settlement rates were pitched too low.*—The above are the two chief causes from which the recorded rent-rolls of 1275 Fuslee do not, in my opinion, represent the value of the lands; and from this, as well as from the fact that, during five years (1271 to 1275 Fuslee), the recorded rent-rolls increased 19 per cent., while the increase on the whole cultivation was 2 per cent. and the irrigation *nil*, I could only come to the conclusion that the rates of these villages, at least, were pitched too low.

30. I do not intend that the above rent-rolls should be the standard from which the value of the whole district is to be measured; on the contrary, there are various considerations which would tend to lower the level of those rates in a considerable portion of the district. As far as I can judge, rates not lower than the above could be obtained more or less in eight of the pergunnahs; while in the five inferior pergunnahs, somewhat lower rates would probably be found more acceptable.

31. I have in the above shown that local examination has not only borne out the facts recorded in my office statements,* but has proved that in many instances cases must escape notice unless local examination is made, and that the

* See para. 11 *ante*.

paper evidence I secured did not fully represent the case. The further points of the probable loss to Government, and the causes of present increase of rents, will be treated hereafter.

32. *Anoopshuhur Pergunnah.*—To complete the cases of the other pergunnahs which have been examined and reported on, I have to give the following brief account.

33. In Anoopshuhur, out of 68 villages examined, 62 have been entered in the detailed village statement; of these, 43 villages belong to the Katyani estates held under Court of Wards in Bengal, and 19 villages belong to other proprietors.

34. The Katyani villages show the following result of cultivation and assets during the past five years (1271 to 1275 Fuslee):—

Rent-roll of Settlement.	Jumma (nett.)	Rent-roll of 1275 Fuslee.	Cultivated at Settlement.	Cultivated in 1275 Fuslee.	Irrigated at Settlement.	Irrigated in 1275 Fuslee.
69,241	38,380	72,464	23,631	25,096	9,585	9,824

As will be seen here the jumma is 52·9 per cent. on the present rent-roll. The rent-rolls would have to reach the sum of Rs. 76,760 to correspond with the proper Government demand: 65 per cent. of the lands are held by right-of-occupancy tenants, and their rates are fixed *for the term of settlement*, so that it would be difficult, under such circumstances, to enhance these rates as far as 65 per cent. of the area is concerned.

There are also among the right-of-occupancy tenants some who hold at privileged rates.

35. Putting aside the restrictions which tie down the advancement of the value of these estates, I believe, from what I have seen, that the rates of these estates would be open to improvement along with those of other parts of the district at a fair ratio.

The average rates of the pergunnah at settlement were Rs. 10, Rs. 3-10-0, and Rs. 1-12-0, for the three denominations of soil; and from the rates found in certain average villages, I certainly consider the settlement rates are low, and that rates at Rs. 12, Rs. 4, and Rs 2 would be fairly attainable in the Katyani as well as in order estates.

36. *Giving further instances where settlement rates were pitched too low.*—The result of the 19 ordinary villages will show what the "natural" state of the pergunnah may be considered to be, taking the Katyani estates as exceptional; the results of these 19 mehals are as follow:—

Rent-roll of Settlement.	Jumma. (nett).	Rent-roll of 1275 Fuslee.	Cultivated area at Settlement.	Cultivated area in 1275 Fuslee.	Irrigation at Settlement.	Irrigation in 1275 Fuslee.
33,091	17,229	42,439	10,116	10,754	2,888	3,123

These show very different results from the 43 villages of the Katyani estates, and these may be taken as a very fair sample of the remainder of the pergunnah. Here, in 19 villages which came under examination, because they happened to lie among the Katyani villages, the rent-roll has increased 28 per cent. during the past five years, while the cultivation has increased only 3 per cent. and the irrigation 8 per cent. This gives in a small area a greater difference than that found in the larger cases of Khoorjah and Shikarpore, and this further confirms my opinion that the rates at settlement were pitched too low.

37. *Dadri Pergunnah.*—Dadri pergunnah was examined by Mr. J. G. Robertson. Out of this pergunnah, 93 villages, or half of the pergunnah, have

been entered in the detailed village statement. The remaining villages are all "Bhyachara," and there is nothing to be shown on paper from those villages, which would be of any aid, one way or the other, in the present discussion. Out of the 93 villages reported on, 47 are "báugur" or upland villages, the assets of which are properly ascertainable. The remaining 46 villages are either wholly or partially situate in the valley lands, or "kádir," of the Jumna or Kalee Nuddee rivers.

38. In the 47 villages from which the details are clearly ascertained, the results of the last five years show the following figures:—

Settlement Rent-roll.	Jumma.	Rent-roll, 1275 Fuslee.	Cultivation at Settlement.	Cultivation in 1275 Fuslee.	Irrigation at Settlement.	Irrigation in 1275 Fuslee.
57,436	28,246	67,720	19,192	21,211	7,787	7,834

The assets have risen 17·9 per cent., and the cultivation 10·5 per cent.

39. Mr. Robertson has shown that the rates which were fixed at settlement are low for these lands. The settlement rates were recorded at Rs. 8 for "bárah,' Rs. 3-8-0 for "irrigated," and Rs. 1-12-0 for "unirrigated" lands. If the "bárah" be now taken at Rs. 10, and the "irrigated" at Rs. 4, and the "unirrigated" at Rs. 2, which I am sure are remarkably mild rates, the result would be to bring the assets very much to what they actually stand at the present time.

40. From the above, it is fairly shown that, so far as these 47 villages are concerned, the rates of settlement were pitched too low. It would be probable, also that where in one-fourth of the pergunnah actual assets can be ascertained, and adequate rent-rates can be determined, the introduction of these rates as the standard rates would have a material effect on the gross rent-rolls of the pergunnah, and consequently affect the Government jummas on the large mass of "Bhyachara" estates.

41. *Dunkour Pergunnah.*—Dunkour pergunnah has, to the extent of 40 villages, passed under examination. The statements of these have not been sent up, as, with very few exceptions, they are all "Bhyachara," and would only be affected according as the general level of rates in surrounding pergunnahs might be raised.

42. *Further evidence of present rent-rolls being in excess of Settlement assets.*—I have left but one more set of figures to trouble you with, towards showing that rent-rolls are at present so far in excess of the assets on which the settlement was based, that it would be very unadvisable for the present settlement to be accepted for a permanency.

43. In the 308 villages of which detail statements have been drawn up, I have selected 78 cases in which the inadequacy of the jummas is most apparent. I have selected those which are proved to pay less than 40 per cent. of the rent-rolls, recorded for 1275 Fuslee. The details are as follow:—

Rent-rolls, 1275 Fuslee.	Jumma.	Cultivation at Settlement.	Cultivation in 1275 Fuslee.	Irrigated at Settlement.	Irrigated in 1275 Fuslee.
170,632	62,496	35,892	37,792	14,358	14,875

The gross jummas of these stand at 36·6 per cent. of the rent-rolls.

44. *Probable state of the pergunnahs not locally examined.*—I have every reason to believe that in five other pergunnahs, namely, Buran, Ahar, Pahasoo, Debai, and Agouta, should the assets of these come under local testing, there would be found the same average number of villages, the jummas of which bear much the same proportion to the rent-rolls as those herein recorded. In Secunderabad, Syanah, Dunkour, and Jewar, the numbers would be fewer.

45. *Regarding the financial loss to Government.*—I must next consider the second point referred to in paragraph 11 *ante, i. e.*, "the financial loss to Government from the present settlement." The villages which pay less than 40 per cent. to Government are not alone those in which increase of assets will be found, and, therefore, from which increase of Government demand would be made. As will be shown further on, if careful examination is extended throughout the district, I believe that two-thirds of the rent-rolls would become subject to increase.

46. In considering the subject of the loss to the Exchequer, it is by no means an easy matter for me to decide with anything like real accuracy what that loss is, notwithstanding that I have studied the facts and figures concerning that portion of the district which has come under local examination, and have gone through a vast number of statements and records of the remainder of the district.

47. *Returns to the subject of financial loss.*—I would refer you back for one moment to my paragraph 28. I have there shown the difference between the assets on which the settlement was based and those which I believe might be raised from the lands now of the two pergunnahs of Khoorjah and Shikarpore. In round numbers, my estimate will produce 3 lakhs, while the settlement income was $2\frac{3}{16}$ lakhs. If this scale of increase be extended to the whole district, the gross rent-roll would be 31 lakhs to the $24\frac{6}{16}$ lakhs which I may assume to have been the gross rent-roll of settlement, and the demand would be $15\frac{1}{2}$ lakhs instead of $12\frac{1}{3}$ lakhs; supposing always that the rest of the district stood in the same position and state as the two pergunnahs referred to, and supposing we could secure the full value of the lands.

48. For the purpose of making my calculation of the loss to Government for the whole district, I assume the settlement assets to have been $24\frac{6}{32}$ lakhs, *i. e.*, double the settlement *net* demand. I first cut out of all account one-third or $8\frac{2}{16}$ lakhs, leaving $16\frac{4}{16}$ lakhs as representing the rent-rolls of that portion of the district which would be increased on a revision of settlement. As regards the two-thirds, or $16\frac{4}{16}$ lakhs which remain, I believe that throughout the assets which compose this part of the gross rent-roll of the district, an increase of 22 per cent. could now be secured. The addition of 22 per cent. on the sum of $16\frac{4}{16}$ lakhs amounts to an increase of Rs. 3,60,800, showing an annual loss to Government of half that sum, or of Rs. 1,80,400.

49. I have come to the above conclusion with the greatest sense of caution. The result shows a considerable reduction on the approximate loss of 3 lakhs which I mentioned in April last, in discussing the subject at Allahabad; but I have since then been able to collect the fullest information concerning the one-fourth of the district which has been examined, and I have, besides, gone through a large mass of records concerning the remainder of the district. My present statement is but an estimate, but it is based on very fair evidence.

50. *Estimate of loss is based on present circumstances.*—I estimate the above to be procurable on the circumstances of the lands as they stood in 1275 Fuslee. It is possible that this increase might be secured even after deducting such improvements as may have taken place since settlement by extended cultivation and *well* irrigation; but I would rather stand by my estimate as being what I believe the district can easily bear under its circumstances of 1276 Fuslee.

51. *Conclusion of the subject regarding inadequacy of rents and loss to Government.*—I have had to establish as conclusively as possible the fact of inadequacy of assessment, as the circumstances of the land now stand; it has been, therefore, necessary for me to include every detail which has come to my notice. I may I hope, then, be excused for having come by such slow degrees to the present point.

52. Having come to the end of this portion of the subject under discussion, I will now turn to the further questions of importance which are noticed in the Government Resolution of the 7th May. Included among those is the third question of paragraph 11 *ante*, which will be treated hereafter.

53. *Sanction should be withheld for permanent settlement.*—I am decidedly of opinion, from what I have seen and have shown above, that the settlement should not be sanctioned in perpetuity. As regards the sanction of the present assessment for a term of years, I would beg to record my opinion in favor of the present settlement being sanctioned for a term of years in preference to a complete revision being made now.

54. *Objections to complete revision.*—There are various considerations set forth in the Government Resolution which show how objectionable any present complete revision would be.

The settlement operations have been going on more or less now for above ten years. Although the final operations concluded by Mr. R. G. Currie did not take effect till 1864-65, yet sufficient time has elapsed since then for the people to return to their normal state of quietude.

55. There is also fair evidence that the people have shown a sense of confidence and security in the actions of the ruling power, from the fact of the increased value of the land.

This increase, which is still growing, in the value of the land, is fairly proved by the enhanced value of the rent-rolls. The high prices, also, at which estates have been lately purchased, give additional proof of the enhanced value at which the landed property is estimated.

56. I believe, if revision were to take place now, that very excellent evidence would be attainable on which to base a new settlement ; and, as far as the present assets are concerned, a jumma of 14 lakhs would be secured. But if the settlement so revised were to be determined in perpetuity, the question of revision brings to my mind a very important consideration other than those suggested in paragraph 5 of the Resolution.

57. *Further considerations against revision for permanent settlement.*—I have before me the fact that while in 1271 Fuslee, the Settlement Officer based his settlement on a gross rent-roll of $24\frac{6}{16}$ lakhs, now, in 1275 Fuslee, I am able to estimate the gross rent-roll to be $28\frac{6}{16}$ lakhs, and that for the most part this increase is not attributable to the increase of cultivation or irrigation; but that, apart from any visible improvement, assets have increased to a great and certain extent.

58. I am aware that the Government have acknowledged their willingness to forego future increase in land revenue in introducing the permanent settlement, but I do not think that the possibility of such rapid increase has been anticipated by the Government; in fact the orders of Circular No. 55, dated 27th November 1867, would show that the chief increase in value to be expected was from extended canal irrigation, which might give 20 per cent. additional value to certain lands within twenty years.

59. It may be assumed in arguing this point, that in this instance the assets on which the settlement was based did not represent the full value of the land; but whether such be the case or no, the fact remains the same that at the time of settlement, the rent-rolls were ascertained and believed to be $24\frac{6}{16}$ lakhs, and five years later they are estimated to be $28\frac{6}{16}$ lakhs.

60. I am far from wishing to introduce any theoretic views as to the subject of permanent settlement; I merely think it my duty to bring forward every point which is supported by facts, and which in any way bears upon the present settlement.

61. I may, I think, urge, then, that a complete revision would be harassing to the people, unsettling in its influences, and, if made for a permanent settlement, might be open to question on the grounds of the increasing value of the assets.

I, therefore, turn now to the terminal settlement.

62. *Recommendation for terminal settlement.*—The original terminal settlement was made up to the close of 1296 Fuslee, and I recommend the present settlement to be sanctioned for that term, subject to such amendments as may hereafter come under consideration.

63. I have from first to last been very averse to any partial or "patch work" revision. I believe that a fair and proper revision cannot be made unless the whole of the district comes under examination, and a *complete* revision on present capabilities be taken in hand.

I have above given a decided opinion that such revision would be harassing and unadvisable for either terminal or permanent settlement.

64. *Regarding revision in a few cases to be made as an alternative.*—My views concerning partial revision were first expressed regarding permanent settlement ; and although I still hold to the same principle in the matter of a terminal settlement, at the same time I grant that such an operation is much less open to objection for a settlement of twenty years than for a permanent one; and I make the following suggestions as *an alternative*, in the event of the Government deciding that an annual loss of Rs. 1,80,000 is not to be endured for twenty years.

65. It is necessary, under any circumstances, that fresh engagements be taken throughout the whole district for the purpose of introducing the 55 per cent. rule; and this opportunity might be made use of in re-assessing the most notorious cases of inadquately assessed villages for the term of settlement.

66. Positive or individual injustice would not be done to those proprietors who have secured palpably light assessments, especially as there is every reason to believe that many of those men wilfully disguised their assets at the time of settlement. There would, of course, be several cases in three-fourths of the district which have not been examined which would escape notice, and those would enjoy their profits for twenty years. The consequent inequality of assessments would not be *comparatively* fair to all parties, but the fact of ten men being punished, while two men equally guilty may escape, does not make the punishment of the ten men unjust.

67. *Scheme for revision in certain cases.*—In introducing my plan I would beg to refer you to paragraph 43, where I have given the totals of certain cases in the pergunnahs which have been examined.

These are instances in which the jumma or Government demand now paid is less than 40 per cent. of the assets for 1275 Fuslee. In the pergunnah books which have been prepared, it can be found at a glance where, *according to record*, the demand now stands at less than 40 per cent. of the assets. All cases of this standard might be selected, and these cases should be examined, and if the entries turn out correct, the new demand should be taken at 55 per cent. of the present assets; increase in cultivation and in well-irrigation since settlement would be allowed free of charge.

68. In paragraph 43 I have shown the details of 78 villages taken from the pergunnahs which have been examined ; the remainder of the pergunnahs will probably produce some 200 more villages. These could readily be examined during the next cold season, and the jummas be fixed before July 1870 A. D.

69. There are other villages which I myself would like to see come under revision (if any revision is to take place at all) ; such villages as the two mehals of Jarcha in Pergunnah Dadri, of Deoralah in Pergunnah Khoorjah, and of Sarora in Pergunnah Anoopshuhur.

The evidence in these cases does not appear in the pergunnah books.

Their recorded rent-rolls represent but a portion of the value of their incomes. I recommend that any attempt at revision in these cases should be kept to valuable villages, say, to those which pay a thousand (1,000) rupees and upwards of Government demand.

70. The revising officer having found a fair standard level of rates for the villages which pay less than 40 per cent of their assets, would be able to select other valuable villages which show rates below that standard level.

There would not be many villages of this description. These, too, should be examined, and fair jummas fixed at the standard level of rates. The rent-rolls which are now merely nominal, or which are really elastic, would at once reach a better figure.

71. The villages which may be selected for revision will be set aside for the cold season work, and in all others proclamation should at once be given that the present settlement, subject to the introduction of the 55 per cent. rule, will be sanctioned for the term of the settlement, *i. e.*, to close of 1296 fulsee.

Those villages which become subject to revision will be examined during the cold season, and be reported on in time for all operations to close before the 1st July of next year.

72. I propose the above partial revision as an *alternative*, in case the Government think it to be unadvisable to sanction a settlement of twenty years' duration as matters now stand. If, on the other hand, the Government think that it would be better to let the case stand as it is now for twenty years, nothing further will have to be done but to introduce the 55 per cent. rule, and to alter the administration paper to such an extent as may be thought necessary. Regarding this latter matter, I will bring the subject before you further on in this report.

73. *Showing that increase in income is not the result of local improvement.*—I have now arrived at the 8th paragraph of the Government Resolution in which I am directed "to show how far the present proprietary income is the result of the improvements effected since settlement by landlords or by tenants, or by canal irrigation,"

In the figures I have given in my paragraphs 17 and 43, I have shown that the increase in cultivation is very slight, and that the increase in well-irrigation is confined for the most part to sinking cheap (kutcha) earthen wells, and to cleaning out old wells.

It is probable that during the years of settlement, wells were allowed to fall out of repair, and that much of the late increase in this irrigation is but a return of the irrigation to its normal state. There is nothing whatever to show in any part of the district that any expenditure has been made to any appreciable extent either by landlords or tenants.

74. *Canal irrigation.*—The area of canal irrigation has extended largely, but the extension is probably confined to some 400 villages. Taking the district, as one case, up to 1275 Fuslee, extension of canal irrigation has not caused any large addition to the rent-rolls. I believe that had the canal extension investigation (Circular No. 53, dated 27th November 1867) been carried out in about 400 villages, the permanent settlement would have been withheld. In other cases as well indeed as in these, a considerable portion of the canal irrigated area takes the place of what was formerly irrigated by wells.

I may add that in making my estimates of value throughout the present work, I have, except in a few exceptional cases, based my estimates on the "irrigated area" as recorded at settlement.

75. *Rise in rents, and the causes.*—Paragraph 9 of the Government Resolution concerns the "rise in rent," the several causes of which are to be traced. The rise in rents occurs either from increase in the various rates of rental, or from increase in the gross value paid for the land either in cash or "kind." There were not at the time of settlement more than 40 per cent. of villages paying in "rated" rents. Many of these cases changed their system, directly the settlement was done, to that of paying in lump sums, or by "sárásuree," or average rates, discarding the settlement arrangements, and forming new sums of assets. In the differential rates fixed at settlement by the Settlement Officer, the changes are,

as far as I can find, but slight. Where, however, the *tenants-at-will* predominate, changes have taken place; but for the most part the increase in the *rental value* has occurred in villages where "differential" rates have been given up and other money payments introduced, or where fixed cash rent-rolls have been secured in lieu of the "kind" payment of settlement, which latter appear generally to have been estimated very low.

76. *Determination of Government demand one cause of immediate rise in rents.*—The determination of the Government demand is the one chief cause of rise, especially in villages which are free from any number of right-of-occupancy tenants, who may have hitherto been accustomed to hold at rather low rates. The fact of the Government demand having been fixed, undoubtedly brought the land almost at once to its proper value. In other cases, the value of the land has, I think, risen from the increased value of produce, and in special circumstances from the increased prosperity of any class of cultivators.

77. *State of rent-rates.*—I do not find that the *rent-rates*, which were settled judicially at the time of settlement, showed any rise at that time. The adjustment of rent-rates was made in some cases simultaneously with the adjustment of revenue, and in other cases immediately after the demand was fixed; and as a rule, the rent-rates so adjusted were made to agree with the bases of settlement. The rise of rents occurred as soon as the settlement operations were finally closed. For instance, take Khoorjah Pergunnah as an example: this was originally settled in 1861, and the permanent settlement as made in 1864; the rise in rents took place in 1865 and 1866.

78. *Rents adjusted after settlement out of Court.*—As a rule, the adjustment of rents which has occurred since settlement, has been done by the parties themselves without application to the Courts.

79. *Scale of rents the same for right-of-occupancy tenants and others.*—In almost all cases the rents for the right-of-occupancy tenants and for tenants-at-will were fixed at the same scale; and in cases of enhancement, where such took place immediately after the settlement was made, both classes were equally affected. The increase, however, in assets was more common in villages in which no right-of-occupancy tenants were than in those in which such tenants predominate. It is natural that the greater increase in assets should occur in villages where tenants-at-will hold the most lands. Seeing, however, that the assets improved so rapidly directly the settlement was determined, and that in many cases right-of-occupancy tenants held lands, it may fairly be considered that the parties concerned had agreed to certain rents which were to come into force directly the jummas were fixed.

80. *Reasons why rents were kept low during settlement operations.*—The settlement operations were going on from 1858 to 1864, and it was natural that during that period everything affecting improvement, or increase of assets, would be at a stand-still; and that so long as the Government demand was not known, the rental or value of the land would not reach its proper level.

The re-action took place directly the Government demand was fixed. It is true that the increase is still in progress, and it will, I think, improve yet more; but the strides made from 1272 to 1274 Fuslee were greater than will occur for some time to come.

81. *Regarding the adequacy of the present assessments when compared with the resources of the district at time of settlement.*—The above subject brings me down to paragraph 10 of the Government Resolution. I am asked, if it is possible to say "how far the new assessments can be viewed as adequate or otherwise, in reference to the resources of the district as they existed at the time of settlement?"

82. If the assessment made at settlement is to be judged by the value of the rent-rolls as attained very shortly after settlement, it may be fairly presumed that the assessments did not represent 50 per cent. of the resources of the

district at the time of settlement. There is nothing to show, for instance, that the actual value of the lands increased, from 1271 to 1272 and 1273 Fuslee, at all in the same ratio as did the *value of the rent-rolls.* It is another question how far it was possible for the Settlement Officers to *gauge the resources of the district.* But, in the first instance, in order to answer the original point, I must enter into a little detail regarding the time and method of the settlements, and the action taken by settlement officers in determining the value of the lands.

83. *Reference to the system pursued by Settlement Officers in gauging the resources of the district, and in completing the settlements.*—There were, in the first place, two distinct settlements, (1) the terminal settlement, and (2) the permanent one. In dividing the responsibilities of the Settlement Officers over the various pergunnahs, I find the result to be as follows:—Mr. Charles Currie is responsible for the terminal or original settlement of Burrun and Agowta; Mr. George Freeling (deceased) for Anoopshuhur, Shikarpore, Debai, and Puhasoo; Mr. William Lowe (deceased) for Khoorjah and Jewar, Mr. R. G. Currie for Ahar, Syanah, Dadri, Dunkour, and Secunderabad.

84. Mr. R. G. Currie, in paragraph 67 of his report, details at some length the method on which the work of fixing rates of rent was done, the summary of which is, that "prevailing rates of rent for different classes of soil, average or 'sárásuree' rents, and rents paid in lump sums, and prevailing 'zubtee' rates were ascertained, and from the evidence of these the average rates were formed;" and, as is shown in Nos. II and III Statements, the different classes of soil were priced by the application of these rates. These rates, too, in many instances, appear to have been the guide for the adjustment of rents in the various pergunnahs. So far it would appear that the settlements were based on the prevailing rates of the several pergunnahs of the district; variations in assessments being made to suit, as much as possible, the peculiar circumstances of each village.

85. *Concerning the prevailing rates at time of settlement and free use of jummabundees.*—The next question, then, is how far the average prevailing rates represented the resources of the district; and it is to this point that I wish to call attention.

86. *Prevailing* rates are those which are most popular or universal; exceptional rates being less popular and not universal, are likely to be cut out of the account altogether. This would tend to keep the "rates of rent" to a low level.

87. There are no figures given to prove how far the prevailing rates may have varied in different cases, nor are the prevailing rates of any one class of villages tested by, or compared with, the prevailing rates of other villages. As a rule, the "differential" rates fixed at settlement agreed generally with the bases of settlement; but the totals of the rent-rolls of many villages fell below the totals of rent-rolls of other villages of the same sort, without any reason for the difference being given; also, the "jummabundees," in cases where there were no prevailing rates, appear to have been accepted too much as true, and as representing the real value of the lands, without any tests having been applied. There may have been much done which has not appeared on paper; but, in the absence of any evidence, and from the fact that immediately the agreement papers were signed the rent-rolls rose, I have not to jump very far to arrive at the conclusion that the recorded jummabundees were too freely accepted as the bases of settlement.

88. *Result of free use of jummabundees has proved to be different in Boolundshuhur than in other districts.*—In a late report in the *Revenue Reporter*, Vol. III., No. 2, page 70, *note*, special attention is called to the fact that in the district of Roy Bareilly the settlement is based entirely on jummabundees, and the result gives almost the heaviest assessment in India. These jummabundees must have been more faithfully kept, and possibly more fully tested, than the ones of this district; otherwise, whence the rapid increase in the rent-rolls directly the jummas were fixed? It is possible that the same may occur more or less in Roy Bareilly

or Furruckabad, or even Meerut, where, I believe, the Rs. 2-6-0 per acre revenue rates are over-topped. In the case of Boolundshuhur, it has been found that in very many instances the assets, which were based on jummabundees, have so far increased during the five years succeeding the settlement, without any proportionate increase in cultivation or irrigation, that sanction to a permanent settlement has most likely to be withheld. It has been my duty to certify to the facts of the increase, and, if possible, to state the causes; and, in doing so, I have to state my decided impression that a *too free* and *single-handed use* of the recorded jummabundees has resulted in inadequate assessments.

89. *Comparative tests would have improved the assets.*—There are many villages having a good, honest, rent-roll, with an equivalent demand, while other villages, of the same sort and with the same capabilities, have lower rent-rolls and light jummas. A more careful comparing of different villages of the same class, and of villages of different classes, would have resulted, I feel sure, in an increased demand in very many cases, especially in those which at the time of settlement made payments in "kind," or contained large tracts under "seer" cultivation.

I think, then, that the pergunnah rates would have reached a better level in those villages, and that "Putteedaree" and "Bhyachara" villages would have followed suit, and the general Government demands have been improved.

90. *Recorded bases of settlement did not represent* bonâ fide *assets.*—It may, then, be fairly gathered that in most cases in which increase of assets has taken place, the assessments were not adequate to the *bonâ fide* resources of the district at the time of settlement, although they represented at that time a fair share of the *apparent* resources, or, in other words, of the assets as shown by the jummabundees on which the jummas were fixed.

91. *Permanent settlement how done.*—The bases of the assessments which were made for the terminal settlement were also the foundation on which Mr. R. G. Currie determined his permanent settlement.

92. When the first orders for permanent settlement were published in August 1864, Mr. R. G. Currie was personally well acquainted with the circumstances of seven pergunnahs, and there were six with which Mr. Currie was not particularly well acquainted. I give extracts from Mr. Currie's report, paragraphs 90 and 91, which will show how the permanent settlement was introduced.

93. *Extract from Mr. Currie's report.*—The following are the extracts:—

Para. 90.—"In revising the work of my predecessors, and also in reviewing my own assessments, the greatest care and pains were taken, and thus revision was in reality tantamount to an entirely fresh assessment of the whole district. I was intimately acquainted with the pergunnahs of Anoopshuhur and Debai, assessed by Mr. Freeling, &c. The same applies to Syanah and Ahar, which I had also myself assessed; and the three pergunnahs of Tehseel Secunderabad I had just lately visited and completed their assessment."

Para. 91.—"I did not, therefore, visit those pergunnahs which I knew thoroughly, but commenced upon the revision of Anoopshuhur, and finished it, and also Pergunnah Ahar, before the cold season and time for going out into camp arrived. I was not so well acquainted with the Pergunnahs of Agowta, Burrun, Shikarpore, Puhasoo, Khoorjah and Jewar, and therefore conducted the revision of each of these pergunnahs in tents in the pergunnah itself, visiting all the villages generally, and carefully inspecting those in which any special attention was necessary. I went over the whole of the six pergunnahs, and also spent about a fortnight in Secunderabad, during which time I had a general look at parts of Dadri, Dunkour, and Secunderabad, which I was anxious to see again, from the commencement of October to the end of February, encamping in three or four different places in each pergunnah, and revising the assessments of the villages in the part in which I was encamped."

94.—*Rapid action in forming permanent settlement.*—Mr. Currie, in his paragraph 90, states that this work was, in fact, "tantamount to an entirely

fresh assessment of the whole district." The circular order, No. 18, was dated 1st August 1864. In accordance with that order, Mr. Currie as above described began his permanent settlement work in August 1864; and the operations were completed and the final report and statements were sent in in April 1865. It is to be observed from this that in the whole district, consisting of 1,798 mehals, a complete revision of settlement took place, and was finally closed within eight months from the time of its commencement; and that with 686 mehals, out of the 1,798, the revising officer, when he set out on his work, was not intimately acquainted!

95. The revision was complete; that is to say, in every case the jumma-bundee assets were gone into, and settlement was made according to the evidence of those assets. It did not happen that the jummas in every case were altered, but they generally underwent chance. The rent-rolls on which the permanent settlement were based were those rent-rolls on which the terminal settlement had been based, or which had come into force together with that terminal settlement. In fact, as I have above stated, the bases of the terminal settlement were mainly depended on by Mr. Currie in his permanent settlement; and whatever defects there were in the *modus operandi* of the terminal settlement, the same ran on into the permanent settlements.

96. *Entries in administration paper.*—I have come to the last point under report, namely, the paragraph concerning the entries in the administration paper. In very many instances, and notably in the Katyani estates, the rents of the right-of-occupancy tenants have been fixed *for the term of the settlement.* The High Court have lately ruled that "specific entries of that sort are binding on the parties concerned." It would, therefore, appear that the rent-rolls in certain cases *are fixed* for the term of the settlement, and the present settlement was made mostly permanent.

97. It is doubtful how far those entries, which have, in many cases, the force of contracts, can be formally disallowed, at least except under legal authority. If it is now found advisable to close these entries, and any legal difficulty stands in the way of their annulment, the best plan would be for the present settlement to be sanctioned up to 1277 Fuslee, and a new one be opened for a term of years from 1278 Fuslee, with revised administration papers and record of rights.

98. There are also other entries regarding the rents payable by tenants-at-will and the terms for such payments. These terms are year by year falling in, and, though irregular, will very shortly cease to have effect. The cases, also, are rare. I may, however, notice two peculiar cases which I have met with, in which "these tenants are to hold for ten years, and cannot be ousted so long as they pay their rent then fixed, and can sub-let the land to whom they please, and for any amount;" another, in which these tenants are recorded "to hold at fixed rents for a term of years, and that the zemindar cannot enhance unless he himself improves the land."

99. If it is necessary, supposing the twenty-years' settlement is approved, to correct the administration papers—and I certainly think it is necessary—these papers should, I think, be *completely* re-written. As they stand now, they are very voluminous, and contain a good deal of superfluous matter. The introduction, also, of the 55 per cent. rule will require a re-construction to a certain extent of the records of proprietary rights.

100. *Brief summing up of proposals.*—In conclusion, I will summarily put together my proposals—

1*st.*—The permanent settlement, as the case stands now, should not be sanctioned.

2*nd.*—Complete revision for permanent or even for temporary settlement is unadvisable.

3*rd.*—The present settlement should be sanctioned up to the end of 1296 Fuslee year or 1890-91 A. D.

4*th.*—If the Government consider an annual loss of Rs. 1,80,000 to be unrearable, a partial revision can be made, to be confined to all cases in which the Government jumma stands at less than 40 per cent. of the assets of 1275 Fuslee; also to extend to the few other *notorious* cases in which the Government demand is not less than Rs. 1,000, and in which the assets are below the fair standard.

5*th.*—In all other cases the jummas should be immediately sanctioned.

6*th.*—If the Government consider it necessary, the administration paper should be altered, and all unnecessary matters be left out; also, if such cannot be done, in consequence of the present papers in many instances having for the term of the settlement the force of contracts, the present settlement should be sanctioned to 1277 Fuslee, and the new settlement begin from 1278 Fuslee.

7*th.*—The introduction of 55 per cent. rule should be made at once.

8*th.*—The whole work should be completed by 1st July 1870.

101. *Mention of the Assistant Settlement Officer.*—I have much pleasure in bringing to the notice of the Government the very valuable assistance I have received from Mr. J. G. Robertson, through whose hands and under whose superintendence all the detail of the office work has passed. Mr. Robertson has made most minute and careful examination of the pergunnahs made over to his charge. I am indebted to Mr. Robertson for a large amount of general information which he has collected in the course of his work.

[For Resolution No. 1034, *vide* Proceedings No. 25.]

Note by H. S. Reid, Esq., *Junior Member of the Board of Revenue, North-Western Provinces, on* Mr. Cairnes Daniell's *Boolundshuhur Revised Settlement Report, dated 6th September* 1869.

Mr. Daniell gives statistics regarding the Government demand, rent-roll, cultivated and irrigated area at time of settlement (Mr. Currie's), and in 1275 Fuslee for 263 villages in Pergunnahs Shikarpore, Khoorjah, Anoopshuhur, and Dadri.

The totals are as follow:—

		Rs.
(*a.*)—Government demand fixed by Mr. Currie	...	2,01,955
(*b.*)—Rent-roll at settlement	...	3,95,168
(*c.*)—Ditto 1275 Fuslee	...	4,62,823
		Acres.
(*d.*)—Cultivated area at settlement	...	1,23,619
(*e.*)—Ditto 1275 Fuslee	...	1,29,151
(*f.*)—Irrigated area at settlement	...	51,600
(*g.*)—Ditto 1275 Fuslee	...	51,844

That is, in 263 villages with a Government demand of Rs, 2,01,955, the rental assets are supposed to have increased by Rs. 67,655, or 17·12 per cent.; the area under cultivation by 5,532 acres, or 4·48 per cent.; and the irrigated area by 244 acres, or 0·47 per cent.

Assuming the rental of 5,532 additional acres brought under cultivation, and the additional rent of 244 additional acres irrigated to be at Rs. 2 per acre (which appears to be a sufficiently moderate calculation), we must deduct (5,532 + 244 =) 5,776 × 2 = Rs. 11,552 from Rs. 67,655 (the excess of the rent-roll of 1275 Fuslee over that of Mr. Currie's settlement) to find the additional rental obtained on the area under cultivation when Mr. Currie's assessment was made. The remainder is Rs. 56,103, equivalent to a rise of 14·2 per cent.; that is, the rental of the area assessed by Mr. Currie at Rs 2,01,955 was 14·2 per cent. higher in 1275 Fuslee than it was supposed by him to be when he made his assessment.

The revenue by Mr. Currie's sasessment is Rs. 12,33,536 (see paragraph 47 of Mr. D.'s report).

If the 263 villages with a Government demand of Rs. 2,01,955 are to be taken as a "fair sample" of the whole district, there would be a loss of Rs. 1,72,000 (in round numbers), *i. e.*, 14 per cent. on Rs. 12,33,536 on the 1275 Fuslee rental of the land under cultivation when Mr. Currie's settlement was made, or of Rs. 2,09,701 ($=\frac{12,33,536\times17}{100}$) on the entire rental of 1275 Fuslee.

Mr. Daniell, by another mode of calculation (which is based on the figures relating to 154 villages of two pergunnahs only, *viz.*, Khoorjah and Shikarpore, while I have taken 263 villages of four pergunnahs), shows the loss to be Rs. 1,80,000 (see his paragraphs 48 and 49).

These figures (whether Mr. Daniell's or my *results*) may be accepted as showing that Mr. Currie's assessment was based too entirely on jummabundees, which might have represented the actual rental, but which should have been corrected by a reference to prevailing rates, *i. e.*, on *declared* in place of *deduced* jummabundees (to adopt Mr. C. A. Elliott's terminology). Had the *value* of the land as well as the existing rental (which was probably under the proper value of the land) been taken duly into account, there would not have been so large a disproportion between Mr. Currie's *jumma* and present (or 1275 Fuslee) rental assets within so short a period as that which has elapsed since his assessment.

These same figures also prove that Mr. Currie's assessment cannot be accepted as the bases of a permanent settlement.

I would here remark that I understand Mr. Daniell to be satisfied, after an examination of jummabundees, that Mr. Currie assessed on the rates nominally paid by cultivating proprietors on their own "seer," in place of rating such "seer" land at the rents which non-proprietary cultivators would have paid (see Mr. Daniell's paragraphs 22, 23, and 24).

Mr. Daniell proposes that either the settlement be sanctioned as it stands (with a revision in regard to the municipal cess) for twenty years (the remainder of the original term of settlement), or that a partial revision be made in the shape of a re-assessment of those Government demands on those villages of which the jumma now paid is less than 40 per cent. of the assets for 1275 Fuslee. Mr. Daniell estimates there would be about 278 such estates.

I would recommend that the present assessment, with the necessary revision of the municipal cess, be sanctioned for the whole district for the remainder of the original term of settlement. The Settlement Officer cannot now assess on existing assets, or on those of 1275 Fuslee, and it is hardly possible now to discover what the actual assets of 1275 Fuslee were. Undoubtedly much land held by cultivating proprietors was assessed at too low a figure. But, on the other hand, there has been a large actual increase on the rental, and I doubt whether the Government would be justified in claiming a share in that increase. That the rise in rent resulted immediately on the determination and declaration of the Government demand, and that it was not the result of local improvements, are facts which do *not* appear to admit of doubt. But, on the other hand, it cannot be denied that rents will rise immediately on the introduction of a revised assessment; and if the Settlement Officer has not made due allowance for the same in his determination of what the rental *ought* to be before the declaration of the jumma, the Government can hardly raise its demand after the lapse, at any rate, of four or five years. In other words, if the assessment was made on jummabundees not thoroughly tested and corrected by a reference to prevailing rates, the error can scarcely be remedied years after the assessment was declared.

I would here note with reference to Mr. Daniell's remarks in his paragraph 89, that the jummabundees of the Roy Bareilly District (in the Baiswara Division, of which I was in charge in 1865) were very carefully and thoroughly tested by Major MacAndrew, the able Settlement Officer of that district.

With regard to the objectionable entries fixing the rents of right-of-occupancy tenants for the term of settlement, and of tenants-at-will for a term of years, I should have denied that such one-sided agreements without any good or any valuable consideration whatever, had the force of contracts had it not been for the ruling of the High Court (quoted by Mr. Daniell), which appears to me to be "bad law." "An obligation entered into without any consideration at all cannot be meddled with after it has once been performed. If not carried into effect already, it will not be aided by the Courts"—(*Macpherson on Mortgages, p. 27, Edition of* 1864.)

But anyhow the administration papers containing the obnoxious stipulations should be amended. To effect this, it will be unnecessary (as pointed out in His Honor the Lieutenant Governor's confidential resolution, dated 7th May 1869) "to have an entire reconstruction of the administration papers." It may not be sufficient to erase the objectionable entries. The cultivators, whether tenants with right-of-occupancy or tenants-at-will, are not parties to the administration papers. Their consent to the withdrawal of the zemindar's self-imposed restriction in the matter of enhancement of rent, &c., is not required.

I concur.

J. F. D. INGLIS,
Senior Member.

The 20th September 1869.

Dated Camp Kant, Shahjehanpore District, the 22nd November 1869.

Demi-official from—R. G. CURRIE, Esquire,
To—MR. SIMSON.

I have received the printed copy of Mr. Daniell's report on the Boolundshuhur Settlement with your note, drawing my attention to the fact of this report and other papers printed with it being *confidential.*

There are many points that can be refuted, and others that can be most satisfactorily explained; but I have no references with me, and I cannot, merely from memory and without any district map or books and papers of the Boolundshuhur Settlement, enter as fully into details as I should like to do.

I trust, however, that if the following short explanation does not convince His Honor that the assessment of Boolundshuhur is by no means so low as Mr. Daniell makes it out to be, and that the work was not done in so careless and blind a manner as Mr. Daniell's account would lead any one to suppose, I may be allowed time to collect facts and to submit a full and detailed refutation of some parts, and explanation of other parts, of Mr. Daniell's report, before these papers or any memorandum or resolution of His Honor written upon them pass from their present *confidential* to the *official* state.

It will be observed that the rental of *one* year is taken, 1275 F. S., in which the rains were remarkably good, so good that "the irrigation in Khoorjah fell off" (*vide* paragraph 19). It should also be borne in mind that this was the 5th or 6th year after the jummas of most of the villages examined had been given out, and of those revised jummas being in force.

It stands to reason that the revised assessments having been in force all over the district for various periods of from three to eight years, and the year 1275 F. S., being an exceptionally good one, the rentals of that year should be very considerably above the average of the preceding five or six years, and moreover much too exceptionally high to be taken as a standard of fair average rentals, which should form the basis of assessment.

The country had recovered from the famine of 1860-61, and there had been time for the railway to make its influence felt, and for the people to realize the facility afforded by it, for transporting grain, cotton, and indigo. Prices had been keeping much higher even at the harvest than they had ever been known before,

and undoubtedly the rents were sensibly affected by all this. The short leases of three and five years, entered into by many of the zemindars with their tenants-at-will, had most of them expired, and new leases had been entered into at enhanced rents, because the zemindars and cultivators (who had but lately been accustomed to appraisement of crops and payment in money at the harvest prices) both said that the prevailing prices would admit of it.

I think it most astonishing then that, under these circumstances, of which Mr. Daniell must have been aware, he could have written (*vide* paragraph 29) "as well as from the fact that, during five years (1271 to 1275 F. S.), the record rent-rolls increased 19 per cent., while the increase on the whole cultivation was 2 per cent., and the irrigation *nil, I could only come to the conclusion that the rates of these villages were pitched too low.*"

Surely this, very increase, of which he speaks should have opened his eyes to the probability of other causes bearing upon the discrepancy of the present and former rentals, besides the pitching too low in the first instance of the average rates by the officers who made the assessments.

The annual loss of Rs. 1,80,000, estimated by Mr. Daniell, is moreover calculated as the difference between the existing jumma and that which might now be assessed on the ascertained assets of 1275 F. S. (*vide* paragraph 50).

I also wish to draw notice to paragraph 20, by which it will be seen that the assets of 1275 F. S. represent actual collections not only of money rents strictly so called, but also collections *in kind and by valuation of crops.*

These of course are the cases in which the prevailing high prices have the greatest effect in raising the rental, and such rental, when taken for one exceptionally good year, is not a fair average, but an extraordinarily high rental.

In paragraph 28 Mr. Daniell writes: "The average rates which I believe the above villages can fairly bear," &c., very likely he may be right as to what they can bear now, but he is merely making his deductions from what he now finds existing, from the rent-rolls drawn up by myself and gradually pushed up by the zemindars. These rent-rolls did not exist before. There were very few reliable rent-rolls with the exception of the Ranee of Katyanees and Skinner Estates; the rule in the district was either division or appraisement of crops. I made the money rent-rolls myself, and now Mr. Daniell is drawing inferences of the inadequacy of my assessments from subsequent rent-rolls based upon those commenced by myself. The cause of their having increased I have already explained.

Again, he takes Rs. 15 as the Barah rate. Has he ever worked out the actual Barah rate upon the total Barah area entered in the No. III. statement; for if not, I do not attach much value to his rate. His Honor and the Board are not aware, and probably Mr. Daniell is not aware, that the Barah entered in the No. III statement (the average settlement rate of which Mr. Daniell condemns as too low at Rs. 12) included not only the Barah Proper, but often the whole, and always the greater part of the "Moondah" or "Mujho-la." In fixing the rents, however, between proprietor and cultivators, the Barah and Moondah were separated, and whilst Barah was rated at Rs. 7, 7-8 and 7-12 per beegah (equal to Rs. 11-4 to Rs. 15 per acre), the Moondah rates were from Rs. 4-8 to Rs. 6 per beegah (equal to Rs. 7-4 to Rs. 9-10 per acre).

The average of these was taken and not the average of the real Barah alone.

Mr. Daniell appears to have recorded Barah rates without ascertaining the area on which they are taken and the area used in assessment.

I now refer to paragraph 38 which deals with 47 villages of Pergunnah Dadree. I wish His Honor to call to mind that this pergunnah suffered the most severely of all from the famine of 1860-61; that it had previously suffered very severely during and after the mutiny by internal quarrels at first and severe retribution afterwards; that there had been a great deal of extraordinary sickness in it; that there was no canal before the famine, and very little irrigation; and

that more than three-fourths of the villages were not half populated, and many of the lands were consequently lying fallow. Is it a matter then of astonishment that, after enjoying canal irrigation for three or four years, and the lands being again cultivated, and Jâts having to a considerable extent settled here and there in various parts of the pergunnah, and the zemindars having replaced the deficiency of cultivators, and supposing that their assessments were really fixed, is it I ask a matter of astonishment to any one, or of reproach against me, that the assets have risen 17·9 per cent. and the cultivation 10·5 per cent. ?

I believe that, if the assessment had not been purposely kept moderate there, the assets and cultivation would not have increased, and that the Goojurs would have trusted to stealing and cattle-lifting, instead of taking with a will to agriculture.

Why is Mr. Daniell "sure" that the rates he mentions (paragraph 39) "are remarkably mild?" I believe the answer is to be found in the end of the sentence, *viz.*, because those rates "bring the assets very much to what they stand at the present time." In fact the whole thing turns upon the assets of 1275 F. S., and this is exactly what I object to, as no fair criterion of what the assets were or could be when the assessments were made.

In order to prove that the assessments were made too low, frequent allusion is made by Mr. Daniell and endorsed by the Board that too great reliance was placed on existing jummabundees. Mr. Daniell made this statement in my presence, also before His Honor and the Board at Nynee Tal in September 1868, and I contradicted it. It has, however, only just now, since reading this report, dawned upon me whence Mr. Daniell got this idea. I think I can give a full and satisfactory explanation of it.

There were no jummabundees at all or very few indeed upon which any reliance could be placed. All the assessing officers wrote, times out of number in their assessment remarks, that the jummabundee was untrustworthy, or false, or unreliable, or palpably low and inadequate, or words to this effect, till they were perfectly tired of writing them. In the first assessments not one of the several assessing officers ever mentioned a nikasee except to refute its authenticity. When, however, I went over all the assessments previous to introducing the permanent settlement, I did mention the jummabundees, as I had had a record drawn up of the jummabundees which had been drawn up in the Settlement Department after the original jumma has been given out, and also of the jummabundees of subsequent years. In several pergunnahs the jummabundees of three and four years were procurable, and I had no reason to suppose that these were not reliable, drawn up as they most of them were after much trouble in getting the parties to come to any amicable decision, or from a judicial decision. There was on the contrary every reason to suppose these correct, and I still believe they were correct for the years to which they referred, for, in many instances, the zemindars and cultivators agreed mutually and of their own accord to the rents they attested remaining in force for different periods varying from three to seven years; and when those rentals were drawn up, there was no idea of a permanent settlement or any revision for that or for any other purpose, short of the next 30 years. These jummabundees I did use and mention in my supplementary remarks, and I still believe that they were correct and reliable, and that no better guide could have been obtained, for with them I had a corrected area of all lands under cultivation, not deduced merely from the jummabundees, but in all villages where there was any large area of bunjur "either judeed" or "kudeem" by local investigation.

All this must be patent to any one who takes up the Volumes of Nos. II. and III. statements for the various pergunnahs, and how it escaped Mr. Daniell's observation he can probably explain, for I cannot.

Hence, although undoubtedly the bases of the first assessments were the foundation of the permanent settlement, still the very best tests procurable were also applied. Mr. Daniell, if he quoted at all from my report, should have done

so more fully, and not have thrown an imputation of hurry and carelessness upon me, which my own report in some of the paragraphs either immediately preceding or following those quoted (for I have no copy for reference) fully explains away. I had no power or authority given me to alter any of my predecessor's work. I was only ordered to introduce the permanent settlement on certain broad principles, not to commence the assessment *de novo*. The necessary revision had already been made. I had only to apply the rules of percentage of cultivation and the like. I did, however, on my own responsibility revise wherever I thought revision necessary, but not needlessly for the sake of Rs. 15 or 20. Because I did the work quick, by working 10 or 12 hours steadily out of the 24, it is now paraded against me in italics as "*rapid action in forming permanent settlement.*"

Regarding paragraph 96, entries in administration paper, I enclose two letters for His Honor's perusal, and if he desires to see the rest of the correspondence, it is doubtless procurable in the Board's Office, but the two letters enclosed are the only ones of real importance, and I wish to have them returned.

From Settlement Officer, Shajehanpore, to Commissoner of the Meerut Division, No. 170, dated 20th August 1867.

From Secretary, Board of Revenue, to Commissioner of Meerut Division, No. 82, dated 17th February 1868.

It is a matter of extreme regret to me that I was never asked to explain any points or to clear up what seemed strange or unintelligible. I would have only too gladly given assistance and rendered every explanation sought for had I only had the opportunity afforded to me.

I really must express a hope that His Honor does not share the idea mentioned by Mr. Reid and concurred in by Mr. Inglis, and of which by Mr. Reid's showing, Mr. Daniell was satisfied, *viz.*, that I "assessed on the rates nominally paid by cultivating proprietors on their own seer in place of rating such 'seer' land at the rents which non-proprietary cultivators would have paid." At all events if His Honor believes this of me, he must also force himself into the belief that I only followed the lead set me by Messrs. Charles Currie, George Hamilton Freeling, and William Henry Lane. Mr. Daniell, however, does not, in my opinion, lay this to my charge. He only instances the fact of the existence of "seer" lands entered at low rates in the jummabundee, as a proof that the jummabundees of 1275 F. S. do not represent the full assessable rental. So far, however, from Mr. Daniell's exemplar (paragraph 23) being a moderate one, it is an excessively exaggerated one. By it, omitting as he says he has done all Bhyachara villages, it would appear that one-fourth of the total cultivated area of zemindaree villages is held "seer," and entered at seer rates in the nikasees. How much better and fairer it would have been if Mr. Daniell had shown exactly how much was held seer, and rated low in consequence, in those villages he is treating of. It certainly would *not* have been any thing like one-fourth of the cultivated area.

Mr. Daniell having expressed an opinion, after a considerable stay in the district, and after enquiries upon this very subject of inadequate assessment, that the loss was approximately three lakhs of revenue, was naturally biassed by his pre-conceived opinion, and by the general outcry, emanating from Meerut, of inadequate assessment, and he was almost bound to prove the inadequacy.

What has he proved, only this that if the jummas were now revised upon the rentals of 1275 F. S., the increase would be about a lakh and three-quarters.

I certainly am of opinion that, under the present state of the Boolundshuhur district, *chiefly as regards canals*, but also with reference to the very rapid strides that prices are taking, and the certainty of rent rising enormously as the railway and pucka roads and Ganges Canal, and its branches open up the traffic of the district, it would be highly impolitic to attempt to make a permanent settlement in it now.

I also think that 20 years would be too short a term to allow of the full development of canal irrigation and general resources, and I am wholly in favor of the present settlement being allowed to stand for the full term for which the

agreements were originally taken, *viz.*, till 1296 F. S., just 20 years more from this time, without any revision whatever, except for the introduction of the 55 per cent. method of collection and abolition of extra cesses.

No. 463 A, dated Allahabad, the 28th December 1869.

From—R. SIMSON, Esq., Secy. to the Govt. of the N. W. Provinces,

To—The Secretary to the Board of Revenue, N. W. Provinces.

I am directed to acknowledge the receipt of your letter No. 1215, dated 5th ultimo, with which is submitted a revised settlement report by Mr. C. A. Daniell of certain villages in the Boolunshuhur District, together with a note thereon by the Members of the Board.

2. In reply, I am desired to forward the accompanying copy of a Minute recorded by the Lieutenant Governor on the subject; and, in calling the attention of the Board to paragraphs 32 and 33 thereof, to request that instructions may be conveyed confidentially to Mr. J. G. Robertson to have the papers of all the estates, in which the assessment is most glaringly inadequate, say under 40 per cent. of assets, with a statement in a tabulated form containing all necessary details, in readiness against the arrival of the Lieutenant Governor's Camp at Boolundshuhur.

3. In respect of the concluding paragraph of the Board's note, the Lieutenant Governor presumes that measures are going on diligently, in the sense there contemplated, for the withdrawal of the obnoxious clauses.

No. 113B, dated Camp Amsote, the 23rd March 1870.

From—F. HENEVY, Esq., Offg. Secy. to the Govt. of N.-W. Provinces, Revenue Dept.,

To—The Secretary to the Government of India, Home Department.

IN continuation of this office letter No. 63A, dated 12th January last, I am directed to forward, for the consideration of the Right Hon'ble the Governor General in Council, a copy of the papers noted on the margin, having reference to the settlement of the Boolundshuhur District, and to request that His Excellency in Council may be solicited to issue early instructions on the question submitted in His Honor's Minute of the 14th December last, copy of which was forwarded with the above communication.

Minute by His Honor the Lieutenant Governor on the land revenue settlement of Boolundshuhur, dated 19th March 1870.

Notes on Mr. Robertson's proposal by Mr. J. Inglis, Senior Member of the Board of Revenue, North-Western Provinces, dated 21st and 15th February 1870.

Note by Mr. H. S. Reid, Junior Member of the Board of Revenue, North-Western Provinces, dated 11th March 1870.

Memorandum by Mr. J. G. Robertson, Settlement Officer of Boolundshuhur, dated 15th February 1870.

No. 114B.

Copy, with copy of His Honor's Minute, forwarded for the information of the Board, in reply to their Secretary's docket No. 241, dated 3rd instant.

Minute by His Honor the Lieutenant Governor of the North-Western Provinces, on the Land Revenue Settlement of Boolundshuhur.

As proposed in paragraph 33 of my Minute on the settlement of Boolundshuhur, dated the 14th December last, I entered further upon the question while marching through the district. Papers by Mr. J. G. Robertson, the revising officer, and by the Members of the Board, are recorded with this Minute; and these, as well as the result of my own further enquiry and deliberation, tend to confirm the views and opinions expressed in the above quoted Minute.

2. The point specially reserved for consideration was whether there might not be exceptional cases of marked under-assessment where enhancement was

justified. I think it has been satisfactorily shown that (excepting the confiscated estate of Jarcha) there are not any such. There seems no reason to doubt that the assessments were framed adequately, under the recognized principles of settlement, at the time when they were determined, and provisional engagements entered into with the proprietors. The disproportion of the present assets to the assessment is mainly due, as set forth in my former Minute, to the great and sudden rise in rents. Therefore, under the principles there explained, I am of opinion that the Government is bound to accept and ratify the settlement.

3. I should now have proceeded to act upon this view, and to pass final orders upon the settlement; but, as already explained, this cannot be done until the question of a permanent assessment in the case of estates coming up to the standard laid down by Her Majesty's Government has been definitively settled. That question is now before the Governor General in Council as submitted with the above Minute in the Secretary's letter No. 63A, dated 12th January last. A copy of this Minute, and of the accompanying papers, should now be submitted in continuation with the request that early orders may be issued.

4. In respect of the estates in which a somewhat higher permanent *jumma* was substituted for the temporary one on condition that the proprietor accepted a settlement in perpetuity, it will be necessary, on the principles justly advanced by the Board, to revert to the original assessment. On the other hand, for those estates of which Mr. Currie lowered the assessments originally fixed, I think that the original assessments, which it now appears there was no just ground for disturbing, may be reverted to; and this measure will more than counterbalance the loss arising from the former measure.

5. I have already directed that the municipal cess for village police be at once introduced. And I purpose also to make it a stipulation in confirming the settlement that the road cess be subject to be doubled. This question is also before the Governor General in Council in the despatch of this (confidential), No. 100B, dated 17th instant.

HURDWAR,
The 19th March 1870. } W. MUIR.

Note on MR. ROBERTSON'S *proposal.*

If the *jummas* of the estates proposed for permanent assessment are reduced to the original temporary *jnmmas,* the loss to Government will be about Rs. 8,000 a year.

There are 142 villages, whose original *jummas* were reduced by Mr. Currie when he revised the assessment of the district in 1863-64. Mr. Robertson would re-impose the original *jummas* on these estates. This would give an increase of about Rs. 10,000 a year, and recoup the loss on the permanently settled estates.

I cannot support this proposal.

The re-imposition of their original *jummas* on these estates would be a revision of their present assessments; but if their *jummas* are revised, why not do this thoroughly and bring them up to their full standard on existing assets, instead of substituting, as Mr. Robertson proposes, for the present low assessment, another which would be very nearly as inadequate as existing rentals.

But I hold that the *jummas* of these estates are not now open to revision; it has not been shown that the *jummas* fixed on them by Mr. Currie were inadequate at the time they were given out; and this is, I think, the only ground on which an order for revision can now be based. That they are below 50 per cent. of the present rentals only places these estates in the same category as the rest of the district, and the fact that Government will lose on the estates proposed for assessment in perpetuity is, in my opinion, no ground for treating these 142 estates exceptionally.

The 21st February 1870. J. INGLIS.

Note on the Boolundshuhur Settlement.

I have now had an opportunity of examining the Nos. II and III statements, the notes recorded by Messrs. Currie, Freeling and Lowe, and other papers relating to the Boolundshuhur settlement.

Mr. Daniell shows that the assessment is below the present assets of the district, and is also of opinion that it was below the assets as they existed when the settlement was made. He therefore recommends—

1*st.*—That the present assessment should not be made permanent.

2*nd.*—That it should be confirmed as a temporary settlement for 30 years, that is to 1890 A. D.

3*rd.*—If the 2nd proposition is not approved, that the *jummas* of all estates, whose assessments are below 40 per cent. of their present assets, should be revised and brought up to the full standard of 50 per cent.

I agree with Mr. Daniell that the assessment of the district is below 50 per cent. of its present assets; but I think that he has failed to prove that it was low 50 per cent. of the assets as they existed when the settlement was made. He considers that the causes which led to the assessments made in 1860-64 being too low were—

1*st.*—That the rates fixed for purposes of assessment were pitched too low, and were not sufficiently corrected by comparison with the rentals of other villages whose capabilities and assets were well known.

2. That the settlement officers placed too much reliance on the recorded *jummabundees* which were incorrect, and showed only the rates paid by proprietors on *seer* lands, not the full rentals.

1*st.*—With regard to rates used by the Settlement Officers—

Mr. Daniell objects to the Barah rate of Rs. 12 as too low, but it appears to have escaped his notice that this average Rs. 12 rate was on Barah and Moondah combined, and that, when distributing the rents, the Barah was rated separately at from Rs. 11-4 to Rs. 15 the acre; and the Moondah separately at from Rs. 7-4 to Rs. 9-10-6 the acre.

With respect to the rates for other soils, I am unable to find anything in Mr. Daniell's report to show that the rates assumed by the settlement officers were below the rents actually paid at the time. He has not adduced any instance of a rent charged in 1860 on any kind of soil which is higher than that on which the assessment was based, all his comparisons are between rents which he finds prevailing in 1867-68, and those which the Settlement Officers state they found to be in force in 1860-64.

He says, indeed, that the fact that his rates, which are higher than the settlement rates, would bring the assets up to very much what they are at the present time, may be taken as a proof that the settlement rates were too low; but to my mind this proves just the contrary. There is no doubt whatever that rents in this district have risen considerably since 1865, so that the fact that Mr. Daniell's rates would only bring the assets to about the present standard is a clear proof that they are higher than those which prevailed before the rise in rents commenced,—that is, in 1860-64, when the assessments were made.

2*ndly.*—That the Settlement Officers relied too much on recorded *jummabundees,* in which *seer* was entered at privileged rates.

On turning to the Nos. II. and III. statements of Mouza Deorola, the village referred to especially by Mr. Daniell, I find that at the time of settlement there were—

646 acres cultivated by proprietors;

736 acres cultivated by tenants;

and that the *jummbundee* filed showed a *nikasee* of Rs. 2,959.

In his notes on this village Mr. Currie says—"there is no trustworthy correct rental, as half the village is cultivated by proprietors."

The full rates applied to the various soils, without any distinction between *seer* and land cultivated by tenants, gave a rental of Rs. 4,142-2. The *jumma* was fixed at Rs. 2,190 to be permanent at Rs. 2,400 after 14 years. Mr. Webster afterwards changed this to a present permanent *jumma* of Rs. 2,300.

I find on going through the Nos. II. and III. statements and Settlements Officers' notes that the same principle was applied to all villages, and have been unable to find one where the assessment was based simply on the recorded *jummabundee*, or where *seer* was rated at exceptional rates in calculating the *nikasee* on which the *jumma* was based.

Further, the Nos. II. and III. statements, with the Settlement Officers' remarks, show that little or no reliance was placed on the recorded *jummabundees* when the original temporary assessments were fixed. Subsequently, when Mr. Currie was employed in introducing the permanent settlement, he occasionally refers to the *jummabundees* filed with *huftgana* papers; but as the *jummabundees* of these villages had been drawn up in the Settlement Department, after the original temporary jummas had been given out, there was sufficient reason to rely on them to a certain extent, which is all that Mr. Currie appears to have done.

I agree with Mr. Daniell that the assessment of the district is below 50 per cent. of its present assets, and that it should not be made permanent; but I am satisfied that the *jummas* fixed by Messrs. Currie, Freeling and Lowe represented very fairly the Government share of the assets as they were when the settlement was made, and that the diminished proportion these *jummas* bear to the present *nikasee* is owing solely to the rise in rents which has taken place since they were given out; and further, that this rise commenced in 1865, some years after the *jummas* were accepted by the people.

If this conclusion is correct, it determines in my opinion the question whether the assessment should be confirmed for its original period or not.

If it could be shown that the assessments made in 1860-64 were below 50 per cent. of the assets of the district as they then existed, and that the assessment ought then to have been condemned as inadequate, I think it should be revised now, notwithstanding the length of time it has been in force.

But if it appears, and to my mind this is clear, that the assessment was an adequate one when made, and would have been confirmed in the usual course, had no delay been caused by the introduction of the permanent settlement, and that it can be styled inadequate only in the sense of being below 50 per cent. of the present assets, which have increased during the last four or five years enormously owing to the rise in rents throughout the country—a rise which commenced long after the assessment was made, and which could by no possibility have been anticipated by the Settlement Officers, I think the Government is bound in good faith to confirm it for the original term.

Indeed if this settlement is revised now on the ground that the *jummas* are below 50 per cent. of the present *nikasees*, which have increased since the assessments were made, owing to a general rise in rents throughout the country, it will be equivalent to declaring that the assessments now being made in other districts are not for 30 years as is generally understood by the people and as given out by Government, but are liable to revision a few years hence if rents rise. That rents are rising everywhere, as the value of silver falls, a new lines of rail are out, is patent to all: consequently, any settlement made now, if tested ten years hence as this has been, will be found equally below the then existing assets and equally liable to revision.

I am opposed to Mr. Daniell's alternative proposition of a revision only of the *jummas* of those estates which are found to be below 40 per cent. on their present *nikasees*. I fail to see the justice of bringing the *jummas* of these estates

up to 50 per cent. of their rentals, while those whose jummas are over 40 but under 50 per cent. remain as they are.

Mr. Robertson's note shows that there are 298 estates in the 13 pergunnahs of the district, whose *jummas* are only 40 per cent. on their present assets. These villages are scattered throughout the district thus:—

In Pergunnah Khoorjah	51
Dadree	12
Anoopshuhur	17
Shikarpore	58
Dunkour	8
Sekunderabad	7
Jewur	9
Seana	10
Agota	18
Burran	19
Ahar	37
Dibahee	21
Pahasoo	25

If the estates, whose *jummas* are over 40 but under 50 per cent. of their present rent-rolls, were included, the statement would embrace nearly every one of the 1,550 villages in the district, for all have shared more or less in the general prosperity of the country; and the lengthy and minute scrunity that has been made into this settlements shows clearly that the assessments fixed by Messrs. Currie, Freeling and Lowe were carefully and equally distributed, and that no pergunnah or tract can be picked out as having heen assessed at rates less carefully ascertained than those applied to others.

The whole district was fairly assessed on its then capabilities, and the settlement must stand or fall as a whole.

If the assessment is declared to be a temporary one for the usual period of 30 years, it will be necessary to determine what is to be done with regard to those landlords who accepted *jummas* at higher rates than would have been fixed for a settlement of 30 years, on the distinct understanding that their assessments should be permanent.

The accompanying statement shows the number of these estates, the temporary *jummas* first proposed, and the permanent *jummas* ultimately accepted, after the choice had been given to the owners by the Settlement Officer.

As the owners of these estates were offered the choice of a higher assessment in perpetuity or a lower one for 30 years, and accepted the higher *jumma*, and have paid it since, on the understanding that, by doing so, they purchased the permanent assessment of their revenue, they are clearly entitled to a refund of the collections in excess of the temporary *jummas* if the Government now decide on limiting the settlement to 30 years.

J. INGLIS.

The 15th February 1870

Note by Mr. H. S. Reid, *Junior Member, dated the 11th March* 1870.

In my note (of the 6th September last) on Mr. Cairnes Daniell's Boolundshuhur revised settlement report, I wrote as follows:—"These figures (whether Mr. Daniell's or my results) may be accepted as showing that Mr. Currie's assessment was based too entirely on *jummabundees*, which might have represented the actual rental, but which should have been corrected by a reference to prevailing rates, *i. e.*, on *declared*, in place of *deduced jummabundees* (to adopt Mr. C. A. Elliott's terminology). Had the value of the land, as well as the existing rental (which was probably under the proper value of the land) been duly taken taken into account, there would not have been so large a disproportion between Mr. Currie's *jumma* and present (or 1275 *Fulsee)* rental assets within so short a period as that which has elapsed since his settlement."

2. Mr. Inglis, while in the Boolundshuhur district, went over the No. II. and No. III. statements and the Settlement Officer's notes of a number of villages, and found no village on which the assessment was based simply on the recorded *jummabundee*. The statements with the Settlement Officer's remarks showed that little or no reliance was placed on the recorded *jummabundees* when the original temporary assessments were fixed.

3. As stated in my note of 6th September last, I understood Mr. Daniell to be satisfied, after an examination of the *jummabundee*, that Mr. Currie assessed on the rates nominally paid by cultivating proprietors on their own *seer* in place of rating such *seer* land at rents which non-proprietary cultivators would have paid.

4. Mr. Inglis, on referring to the No. II. and III. statements of Mouzah Deorala (which Mr. Daniell had specially selected), found that the full rates had been applied to the various soils, without any distinction between *seer* land and land cultivated by tenants.

5. Mr. Inglis, after careful enquiry and inspection of the village statements (Nos. II., III.) and the Settlement Officer's notes, arrives at the conclusion that "the *jummas* fixed by Messrs. Currie, Freeling and Lowe represented very fairly the Government share of the assets as they were when the settlement was made, and that the diminished proportion these *jummas* bear to the present *nikasees* is owing solely to the rise in rents, which has taken place since they were given out; and further, that this rise commenced in 1865, some time after the *jummas* were accepted by the people."

6. Facts which I have since learnt regarding the rise of rents after declaration of the revised Government demand in Zillahs Saharunpore and Meerut convince me of the correctness of Mr. Inglis' conclusions, and account for what before appeared to me to be too sudden and too large an increase in the rental assets since Mr. R. Currie's assessment,—an increase so great and within so short a period as to justify (to my mind) a doubt of the correctness of the returns of rental assests, on which Mr. Currie's assessments were based. In justice to Mr. Currie, I must record my belief that I was mistaken.

7. In my former note I recommended that the present settlement, with the necessary revision of the municipal cess, should be sanctioned for the whole district for the remainder of the original term of settlement. I do not consider that the mere fact of the *jumma* fixed on any one village by Mr. Currie being less than 40 per cent. of the assets of 1275 *Fuslee*, alone justifies a revision of that *jumma*, for the rental assets of 1275 *Fuslee* may have risen more than 25 per cent. above the *jummabundee* on which Mr. Currie, after careful enquiry and necessary correction, assessed.

8. But there can be no doubt that the facts elicited in the course of Mr. Daniell's enquiries (regarding existing rental assets as compared with those on which Mr. Currie's assessments are based) prove that a permanent settlement would result eventually in a heavy loss to Government. Rents are in a transition state. Not only does the enhanced value of agricultural produce act on rent, and the enhanced rent, which shows no inclination to fall, re-act on the market price of agricultural produce, but enhancement of rent has been systematized by Act X of 1859. Formerly rent could only be raised by a cumbersome process. The landlord was compelled to make terms with his tenant, and no rent in excess of that paid for the preceding year could be claimed in a revenue or civil court except on a written agreement. Now the landlord by the exercise of the powers conferred on him by section 17 of Act X of 1859 shows his notices of enhancement broadcast, and the Government officers and the court do the rest.

9. There is, as Mr. Robertson has shown in his memorandum, a keen competition for land. The profits resulting from the high prices which agricultural produce has lately commanded in the market have induced many classes, who

have hitherto followed other callings, to cultivate land as a means of earning a more comfortable livelihood than their former calling enable them to realize.

10. Mr. Robertson suggests that as the revised settlement has not been sanctioned, and rents have risen 10 or 15 per cent. since the Government demand was assessed, the Government, in place of making further enquiries in the form of lengthened investigation village by village (which would be highly unpopular), should raise their demand 10 per cent. all round. It is not improbable that Mr. Robertson's anticipations of being able to carry out the measure without any difficulty would be realised. But the idea cannot be entertained for a moment. We must look to the rental assets obtaining at the time that the Government demand was determined by the assessing officer.

11. The proprietors of those villages which the Settlement Officer considered ripe for a permanent settlement were offered a 30 years' settlement at a certain amount, and a permanent settlement at a certain advance on the temporary demand. Some of them chose a permanent settlement on the higher *jumma*. In all such cases the Government demand should be reduced to the temporary rate, and former payments in excess of the temporary demand be refunded. (I assume that in the face of the steady growth of rent rates, no district can be held to be ready for a settlement in perpetuity at assets which shall be fair to Government without being ruinous to landed proprietors).

12. The loss to Government by this measure (in the form of annual payments only) will amount to Rs. 8,000 a year. The loss must be incurred.

13. But Mr. Robertson would recoup this amount by reverting to Messrs. C. Currie's, Freeling's and Lowe's *jumma* of Rs. 1,11,845 on 142 villages, which Mr. R. Currie reduced to Rs. 1,01,695, "when he was introducing the permanent settlement." Mr. Robertson adds—"As Mr. Currie's only authority for changing the previous *jumma* was the introduction of the permanent settlement, I see no reason why, if the permanent settlement is disallowed, these villages should not again be examined as to the adequacy of the previous *jummas*. I find that, out of these 142 villages, 54 return the *jummabundee*, more than double the original *jumma*. Many of them treble. Some of them quadruple. The remainder either are Bhyachara, or have large amounts of *seer* land, and I dare say a close examination would show equal cause why the original *jumma* should be restored."

14. Mr. Inglis has apparently misunderstood Mr. Robertson, when he (Mr. Inglis) writes—"The re-imposition of their original *jummas* on these estates would be a revision of the present assessments, &c." Mr. Robertson expressly states that "at first sight, this will appear like a revision of those villages by the light of the facts of 1870." But, he adds, "as I do not propose to take the *jummas* which I should think adequate now, but only those which were originally fixed, and accepted by the owners from Messrs. C. Currie, Freeling, and Lowe, I have no fear to any complaints on this head."

15. Mr. Inglis holds that the *jummas* of these estates are not open to revision, as it has not been shown that the *jummas* fixed on them by Mr. Currie were inadequate at the time they were given out, and this is, Mr. Inglis thinks, the only ground on which an order of revision can now be based.

16. A permanent settlement was always offered by Mr. Currie at a sum in excess of that proposed in the case of a 30 years' settlement. The wording of Mr. Robertson's memorandum is obscure, and would justify the inference that Mr. Currie lowered the Government demand on the ground that it was to be in perpetuity. But Mr. Currie must have arrived at the conclusion that the *jumma* fixed by his predecessor was altogether too high, *i. e.*, for either a permanent or a temporary settlement. That they were not too high, *i. e.*, that Mr. Currie's predecessors did not assess on too highly rated *jummabundees*, may be assumed from the fact recorded by Mr. Robertson, *viz.*, that "more than one-third now return a *jummabundee* more than double the original *jummabundee*; many of them treble; some of them quadruple," for it is not probable that rents would have doubled, trebled, or quadrupled within the time.

In these cases the original *jumma* reduced by Mr. R. Currie might, with both justice and safety, be reverted to.

Memorandum on paragraph 33 of the Hon'ble the Lieutenant Governor's Minute, dated the 14th December 1869.

With reference to paragraph 33 of His Honor the Lieutenant Governor's Minute, dated 14th December 1869, in which he directs that a list of villages in which the jumma was manifestly inadequate should be prepared in order that the propriety of an increase might be considered while encamped in the district, I would make the following observations.

2. The Lieutenant Governor's direction was based on paragraph 69 of Mr. Daniell's report, where he mentions three villages* as notorious for the lowness of their jumma. The case of Jarchah is a peculiar one. The village was confiscated at the mutiny, and has remained in the possession of Government ever since. In 1868 it was sold, one Mahal, whose jumma is Rs. 1,700, fetching Rs. 76,000, the other Mahal, whose jumma is Rs. 1,500, fetching Rs. 75,000. This enormous price called attention to the village, and the reason assigned was the lowness of the jumma. The reason in my opinion was that, along with the cultivated soil, there was sold the *abadi*. Now the *abadi* contained a large bazaar with more than 100 shops, each capable of bearing Rs. 12 to 20 annual rent, besides numerous fine pucka houses still inhabited by the old proprietors, and for which they would gladly pay large sums to the auction purchaser. Undoubtedly, too, there was hope of increasing the *jummabundee*. The tenants were at all tenants-at-will, and no change had taken place in the rate of rent since it was fixed at the settlement. A landlord like the Sirdar Bahadur, one of the purchasers, was sure to be able to double the assets. But I think the jumma as fixed at settlement is the fair share of Government on the value of the village as calculated at the pergunnah rates then established. I would, therefore, recommend no change in the jumma as an exceptional case. As the village belongs to Government, Government could announce that the village is sold subject to an enhanced jumma, but then the auction price is sure to be lower. If the low jumma is kept, the auction price will be higher, and thus the proportion is kept up.

* (1) Jarchah.
(2) Deorala.
(3) Sarorah.

3. Deorala is a village in Pergunnah Khoorjah. There are 686 acres held by tenants, and 766 held as *seer*. Mr. Daniell thought the *seer* had been underrated. The tenants paid Rs. 1,762 at settlement, and now pay Rs. 2,517. The *seer* is put down now at Rs. 1,593, making a total (with *sewaice* Rs. 59) of Rs. 4,169. The jumma is Rs. 2,300. Here undoubtedly the *seer* is worth Rs. 3,000, and the village could therefore bear a jumma of Rs. 2,750. But there appears no special reason why this village should be picked out from its neighbours. The whole of the soil was taken into account at the settlement, and the value at the pergunnah rate was Rs. 4,142.

4. Sarorah is in Pergunnah Anoopshuhur. Its jumma is Rs. 2,300, and the *jummabundee* of 1275 is Rs. 6,122. The temporary jumma fixed by Mr. W. Lowe was Rs. 2,150. When Mr. R. Currie was fixing the permanent jumma, there was current a *jummabundee* of Rs. 4,445 fixed after Mr. Lowe had announced his. The rise of *jummabundee* to Rs. 6,122 is due to the action of the landlord in 1275 F., who enhanced the rents of all his villages. I give in the margin a list showing the *jummabundee* and jumma

Jumma.	Jummabundee.	Jumma.	Jummabundee.
127	550	725	1,800
2,126	3,390	1,825	5,500
997	2,535	212	660
327	1,060	780	1,800
486	1,300	460	1,600
300	1,100	279	600
775	2,050	256	640
375	1,110	480	1,600
888	2,500	710	2,200
425	1,500	336	900
475	900	1,854	5,100
500	2,100	567	1,600

of all the villages belonging to this landlord. If the jumma of one is changed, I recommend that all should be changed.

5. This state of matters, however, is not confined to the villages of this one landlord. He indeed, compared with some, bears a character for leniency. All the large proprietors have followed the same course, with the exception of those of the Katyani, Kuchesur, and Skinner estates. In these last special reasons at present debar them. I have prepared a list of 298 villages, whose declared *jummabundee* in 1275 F. was such that the jumma does not amount to 40 per cent. These villages are scattered throughout the whole 13 pergunnahs of the district. This number does not represent all the villages whose jumma is at 40 per cent. of the real assets, for I have taken no note of Bhyachara estates, in which there is every reason to believe that a similar rise in the value of the products of the soil has taken place. Nor are they those where there were peculiar facilities for enhancement. The tenants are of all castes, and are both possessed and not possessed of right of occupancy, nor is there any local cause such as the introduction or extension of new canal irrigation; for the fact in that, unless by allowing new soil to be cultivated, little rise of rent can be traced to this cause. As yet the profits of the canal have mainly gone into the pockets of the tenants.

6. To what then is the rise to be attributed? *First*, I think that at every settlement no landlord puts on his best appearance; a well or two is shut up, a few fields are left fallow, and every attempt is made to keep the tenants on his side. But when the jumma is given out, every thing changes. *Secondly*, and mainly, to the immensely increased value of the produce. This is best seen in the Batai villages, where the *jummabundees* in 1274 F. took a sudden leap, and have since maintained their high standard; so much so is this the case, that suits are coming in frequently now where the tenants wish to have money rates fixed in place of Batai. They find it would be far better to pay the cash rates of the neighbourhood than half the produce when wheat at harvest time sells for 16 seers the rupee. The landlords invariably reply that they will not take the rates sanctioned at settlement for other villages, and have shown me their accounts, which prove that they have been of late years getting treble and quadruple of the jumma. *Thirdly*, and as a consequence of the second cause, to the competition for land. It is a well known fact that in this district, there are more men willing to take to the art of cultivation than can get land. The profits to be made have attracted men who in other times has other employments. Mere day laborers now take a few beegahs, and hope to earn a better livelihood by sowing cotton than they could before; and it is quite common to find barbers, kahars, and coolies cultivating, who never thought of doing so in former times.

7. Is Government then to take advantage of this changed state of things, and if so, how?

8. The settlement has not yet been sanctioned. Before its sanction a changed state of things has occurred, and what might have been an adequate jumma in 1860 is for this reason not adequate in 1870. Government might well then say—"We approve of the assessment of 1860, but we find rents have risen 10 or 15 per cent. throughout the whole of the district. We will sanction the jummas given out by the Settlement Officer with 10 per cent. added."

9. If revision of jumma is to take place, I have every confidence that this plan would meet with the approbation of the people. They all admit that the jumma is a light one, and no complaints are heard of one man's being more or less favorable than another's. They confess the great rise in the value of the produce during the last four years, and while they would dread a new scrutiny and a lengthened investigation of their villages, they would be quite content to let Government share in their increased prosperity.

10. This plan would undoubtedly prevent Government from getting its full share of the increase in villages which possessed special capabilities of improvement, or where these capabilities were unknown or under-rated in 1860; but this

might be remedied by giving a discretionary power to take even more than 15 per cent. increase, when there were good grounds for believing that such a state of matters existed. I anticipate no difficulty in carrying out this scheme, and I would again recommend it to His Honor as that most acceptable to the people.

CAMP SEKUNDERABAD: *The 11th February* 1870.

J. G. ROBERTSON, *Settlement Officer.*

POSTSCRIPT.

11. The question has also been raised whether, if the permanent settlement be disallowed, the jumma of those villages, of which the owners were offered a temporary jumma at a lower value than that at which the permanent jumma was fixed, should not in all justice be reduced to the temporary amount.

12. There are 131 villages so situated, and the total decrease would be Rs. 8,491 per annum.

13. There are two ways of getting over the difficulty:—

1*st.*—These villages are generally those where Mr. R. Currie fixed a rasadi permanent jumma, which was afterwards commuted into a present permanent jumma by Mr. Webster. They are villages where Mr. Currie saw signs of improvement, and where he thought the jumma fixed by Messrs. C. Currie, Freeling and Lowe was too small. Instead of raising the jumma at once as he did in many other cases, he offered the permanent settlement at the temporary value for seven years, and at an increased amount thereafter. I dare say if Mr. Currie had not been allowed by the then rules to make this arrangement, he would have at once taken advantage of the signs of prosperity and raised the temporary jumma.

There would, therefore, be no great hardship even if the present jumma was retained. But still the fact is recorded that a temporary jumma *was* offered at the lower sum, and that the owners accepted the permanent settlement at an increased amount.

If, therefore, not to give them a permanent settlement would imply a breach of faith, the second way hereafter described will afford a means, whereby Government can recover the amount given back.

2*nd.*—There are 142 villages where Mr. Currie, when he was introducing the permanent settlement, lowered the jumma previously existing of Messrs. C. Currie, Freeling and Lowe.

		Rs.	
These had fixed	... ...	1,09,375	without cesses.
Add cesses at 2¼ per cent.	... ...	2,460	
TOTAL	... ...	1,11,845	
Mr. Currie fixed a jumma inclusive of cesses at 2¼ per cent.	... ...	1,01,695	
DIFFERENCE	... ...	10,140	

14. As Mr. Currie's only authority for changing the previous jumma was the introduction of the permanent settlement, I see no reason why, if the permanent settlement is disallowed, these villages should not again be examined as to the adequacy of the previous jummas. I find that out of these 142 villages, 54 return a jummabundee more than double the original jumma—many of them treble and some of them quadruple. The remainder either are Bhyachara or have large amounts of seer land; and I dare say a close examination would show equal cause why the original jumma should be restored.

15. At first sight, this will appear like a revision of those villages by the light of the facts of 1870; but as I do not propose to take the jummas which I should think adequate now, but only those which were originally fixed and accepted by the owners from Messrs. C. Currie, Freeling and Lowe, I have no fear of any complaints on this head.

J. G. R.

The 15th February 1870.

No. 1670A, dated Camp Goura Budshahpore, the 10th December 1870.

From—C. A. ELLIOTT, Esq., Offg. Secy. to the Govt. of the N. W. Provinces,
To—The Secretary to the Government of India, Home Dept.

I am directed to invite attention to this office letter No. 63A, dated the 12th January 1870, with which was submitted a Minute by the Hon'ble the Lieutenant Governor, dated the 14th December 1869, regarding the confirmation of the settlement of the Boolundshuhur District, and to solicit early orders thereon.

2. Until final orders are issued, the uncertainty and doubt as to the assessment which have long prevailed in this district must interfere with the progress of the district, and must prevent the people from "devoting themselves, in the certainty of reaping the results, to the improvement of their lands by the investment of labor and capital. It is most desirable that this long period of excitement and doubt should be brought to a close, and energy and application of capital and labor again fostered by the confirmation of the settlement."

3. The Lieutenant Governor trusts that in view of these reasons, early instructions may be received, enabling His Honor to dispose definitively of the questions respecting the settlement now pending.

Minute by the Hon'ble SIR W. MUIR *on the assessment of Muzffernuggur, dated Allahabad, the 26th May* 1868.

While lately at Meerut I had the opportunity of discussing the settlement of Mozuffernuggur in company with the Commissioner, Mr. Forbes, and Mr. Cadell.

2. Mr. Forbes had been charged with the duty of enquiring how far the late orders of the Secretary of State, in reference to the future possible extension of canal irrigation, would affect the proposals already submitted for the permanent settlement of the greater portion of that district under his instructions. Mr. Cadell has, for some time, been prosecuting local enquiries for this end in the pergunnahs noted in the margin, and Mr. Forbes himself has gone over part of the ground.

Jhinjana. Thanah Bhowun. Shamlee. | Khutowlee. Jansut.

3. The large experience Mr. Forbes has gained in the settlement of Meerut, and the peculiar facilities he has there enjoyed of finding access to the fullest sources of information as to the assets derived under very similar circumstances to those of Mozuffernuggur from the waters of the Ganges and Eastern Jumma Canals, qualifying him in a very remarkable manner for the present task.

4. The opinion both of Messrs. Forbes and Cadell was very decided, that the settlement of a considerable portion of the district of Mozuffernuggur was not such as could be confirmed in perpetuity. Of the five pergunnahs above noted, they were prepared to say this with certainty in respect of Khutowlee and Jansut.

5. The assessment fixed for these pergunnahs, tried by all the tests, both of comparison with general average rates and of a very close ascertainment of actual assets, was alleged to be entirely inadequate. On an assessment of a lakh and a quarter it is shown, on grounds of apparent unquestionable reliability, that the demand should be about half a lakh higher. At the present stage there is no necessity to go into details; it will suffice to say that the grounds on which this calculation rests appear to have been assumed on the most moderate principles.

6 Now, it is evident that if these assumptions are at all based on fact, as I believe them to be, the question is one of far wider reach than the simple issue of whether the assessment should be confirmed in perpetuity or not. The question is, whether such a settlement can be confirmed at all. And I do not hesitate to say that it cannot. It would be unfair to the Exchequer, and unjust

to the rest of India, which expects that every district shall bear its fair assessment of land revenue, and what, if this settlement were confirmed, was lost here, would virtually be thrown as a burden upon the people elsewhere.

7. I accordingly requested Messrs. Forbes and Cadell to draw up in a succinct form the grounds on which they had arrived at the opinion above stated. This they have now done in two memoranda, which are attached to this Minute, and which state in sufficient fullness the arguments on which they have proceeded.

8. On my return to Allahabad, the subject was discussed at a conference with the Board. And it has been fully agreed that there is ample ground for re-opening the whole question of the assessment of this district. The proceedings of Mr. Forbes will consequently no longer be confined to enquiring into the effect of the late orders of the Secretary of State, but will embrace the wider subject of the sufficiency of the assessment absolutely. And his operations will extend to the whole district.

9. At the same time it is not my wish that any very minute changes should be made: wherever the assessment of any estate is found to be fairly sufficient, it will not be expedient to alter it for the sake of any very petty sum. There is an advantage in leaving what has been done to stand, where this is compatible with the reasonable demands of the State as above laid down. But throughout the district, wherever the assessment is palpably inadequate, Mr. Forbes will have the full discretion to make an enhancement, and to give immediate effect to the same. The measure, however, will not be retrospective, unless where the fraudulent action of the zemindars may justify an opposite course.

10. I regret to see that in the proceedings for the commutation of rents in kind, so very delusive a standard has been adopted as to fix them on a proportion to the assessment. This is working on a false circle, assuming that as a basis of rent, which has no direct connexion with rent whatever. The zemindars must be left to sue for enhancement at their discretion, and a juster principle of commutation must be introduced. The average value of the zemindars' share of the crop must be the basis of calculation, with a fair deduction, say, of 12 or 15 per cent. Some deduction of this nature may be proper in reference to the advantages to the zemindar of a fixed income, realized, moreover, without the risk and labor of conversion from kind in the field to money in the market, and to the disadvantage to the cultivator or having to pay an unvarying rent, whatever the variation or risk of loss from season or other causes of uncertainty. The Board will be requested to take this subject into early consideration.

11. The assessments should, as a rule, be fixed at the estimate of a fair but moderate scale of rent, leaving it to the zemindar to assert his claim upon the ryots accordingly.

12. Improvements effected by labour, and capital expended *since* the new settlement, will not be brought under direct taxation. But they may properly justify a proposal for limiting a permanent to temporary settlement if they tend to prove that the settlement had erred in mistaking the eventual capabilities of the estate.

13. As before stated, the question of the applicability of a permanent settlement to these tracts is not otherwise in question. It is admitted upon all hands that, if anywhere, this measure is suitable here. And when an appropriate assessment has been fixed, it will be recommended in perpetuity or otherwise, as the case may fall under the clear and explicit standing rules on the subject.

14 Mr. Forbes will, as soon as possible, relieve himself of the details of the settlement of Meerut. Whatever regards the assessment of the district has been completed, or is very nearly so. What remains should be entrusted, as regards immediate execution, to one of the able assistants of Mr. Forbes' staff. He will still, of course, be responsible for seeing that correct principles are laid down for the completion of the important records still remaining to be drawn up.

And the convenient juxtaposition of his new work will afford him every facility for this purpose.

15. I cannot conclude without expressing the obligations the Government lies under to Mr. Forbes for the intelligent and sagacious action which he has taken in this matter, and of my confidence in the proceedings both of Mr. Forbes and Mr. Cadell,—a confidence which, I am assured, is fully shared both by the Board and the Commissioner.

Memorandum by W. A. FORBES, Esq., *Collector of Meerut and in charge of the Mozuffernuggur Settlement, on the Pergunnahs of Khatowlee and Jowlee Jansut, in Zillah Mozuffernuggur, dated Meerut, the 21st May* 1865.

Having stated our opinions in reply to the Lieutenant Governor, North-Western Provinces, that, however closely these pergunnahs of Khutowlee and Jowlee Jansut might meet the conditions laid down by the Secretary of State for India as entitling them to the supposed advantages of a permanent settlement, the inadequacy of the Government demand lately assessed upon them ought to exclude them from such a measure. Mr. Cadell and myself were directed to record our opinions and our reasons for them, and submit them in the shape of a memorandum. This we now proceed to do.

2. Mr. Cadell, whose memorandum I submit, is the officer to whom has been entrusted the duty of examining and reporting on the estates in Mozuffernuggur fitted or unfitted for permanent settlement according to the principles laid down by the Secretary of State for India, and this he does under my charge or supervision.

3. Having entered upon his work in January last, Mr. Cadell has closely examined the three pergunnahs named in the margin, and has also visited and recorded notes on two other pergunnahs, but not, as I understand, with such minute attention as to be able at present to make any final report upon them.

Shamlee.
Khutowlee.
Jowlee Jansut.

4. It is with the two last-named of the above pergunnahs that we are now concerned.

The great Ganges Canal passes through their midst, and during the continuance of the past term of settlement, their condition has naturally undergone a great change.

The Commissioner, in his paragraph 45, at page 8 of the printed Mozuffernuggur report, gives the increase in cultivation and irrigation as follows in acres:—

	Cultivation.	*Irrigation.*
Khutowlee	1,365	12,217
Jowlee Jansut	7,875	15,596
TOTAL ...	9,240	27,813

It is not quite clear from what sources this information was obtained; for, assuming the No. II statements to be correct, the increase in irrigation in the two pergunnahs appears to be only slightly over 23,000. Even at this reduced figure the increase of assets, as Mr. Cadell states, may be fairly estimated at nearly one lakh of rupees.

5. On this and all other points tending to prove the inadequacy of the new proposed jummas, Mr. Cadell has enlarged in his memorandum from notes most carefully prepared, and from evidence patent to all throughout the country. My duty will be to confirm the conclusions he has arrived at from my own observations made during an inspection of the pergunnah of Khutowlee, which I have examined village by village.

6. Mr. Cadell has recorded, and I think proved, that the assessments of the two pergunnahs under review are inadequate by reason of their having been based

on insufficient and unreliable data, checked, on the other hand, by rates erroneously assumed and deduced, and in this opinion I most fully concur.

The district of Mozuffernuggur is called in the printed report a flourishing one. Yet what do we find as the result of the late settlement,—that after thirty years of what all allow to have been a moderate and minutely accurate settlement, after the Ganges Canal has been introduced, and together with its branch towards Futtehgurh, and the Eastern Jumna Canal, has covered the country with its irrigation channels as with a net work, thereby introducing the cultivation of sugar and the richer products, after the rise in prices of produce and labor, and increase in general prosperity, which everywhere else is so strikingly apparent, we find that the imperial land tax revenue is less and the condition of the district deteriorated, for, had it not been for the canal, the former imperial revenues would have been reduced by one lakh and a half.

7. From every record of the settlement operations, and particularly from the No. II. statements, it is apparent that the assessing officers entered upon their work with the salient points of No. 34 of the Saharunpore rules as their infallible guide,—"The Government does not look for any total increase on the present demand," and again,—"The Collector should aim rather at the equalization of the assessments."

Having carried this step out to its full conclusion by reducing the jummas, they found existing from two-thirds to one-half assets; they began to look around for good reasons for obeying that portion of the same rule found between the two extracts that I have made, but were suddenly checked by the erroneous data pointed out in Mr. Cadell's 4th paragraph. Short term and suspicious leases, untrustworthy putwarees' papers, and landowner's prejudiced information met them at every turn, and they resigned themselves, leaving unnoticed and unheeded the facts and reliable data which were then as now open to them, and, as I said before, patent to all.

8. As a rule rents have been paid in kind; but there was not wanting a large range of exceptions in the shape of cash rents prevailing over both pergunnahs.

This part of the subject has been fully explained, and the results of inattention to them shown in Mr. Cadell's memorandum, paragraphs 11, *et seq*, and it is not, therefore, necessary that I should enlarge upon it. I may mention, however, that after the inadequate jummas had been fixed, a very extensive mutation of produce into cash rents took place. This part of the work appears to have been carried out by a Native Deputy Collector, the basis of whose decisions was not the actual amount and value of produce from the land, or even the cash rents found prevailing in the vicinity, but the amount of the previously determined jummas, and after a while by his own erroneously commuted rents in adjacent estates. The result was as might be expected,—the errors in the assessment were carried down to the fixation of rentals.

9. The evil, however, was not inclined to stop here,—the old cash rents, which had long prevailed, when viewed by the side of these new commuted rents, appeared exorbitant, and the attempt was made by the tenants to obtain abatement; it only failed through a happy ignorance of the law on the part of the superior provincial appellate court.

10. Under these circumstances, it might be assumed that Government alone would be the loser; for although crushed for the time with rentals reduced one-half, nothing could prevent rents flying up immediately the settlement had been declared permanent, and when the landlords, who are now bidding their time, began to sue for enchancement; but if the specimen administration paper—now, it is believed, in the Sudder Board's Office and called for by the late Junior Member, Mr. Cust —is a sample of all, and has not caused them to be revised under orders from the Board, this contingency had been fully provided against, and the fervent hope expressed in the latter part of paragraph 22 of the printed report could hardly, as regards the landowners, be looked for. It was actually therein

provided under a condition that landlords should not enhance rents during the continuance of the ensuing settlements, and that, too, when it was supposed that the settlement was to be permanent and for ever.

11. Mr. Cadell in his 21st paragraph observes that suits for enhancement have been few because they were, as a rule, discouraged. This opinion has been arrived at chiefly from general report, but also from one notable case, wherein a landlord, applying for a very moderate rate, well below those he knew existed around, was disappointed with the intimation that no European officer would countenance such an attempt at rack-renting.

82. In submitting these memoranda, I should state that from what I have seen myself in the Khutowlee Pergunnah, comparing the results of my own observations with Mr. Cadell's conclusions, I am prepared as supervising officer to endorse his report to the fullest extent. In his paragraph 14 he estimates the loss to Government under the present assessment of the two pergunnahs at nearly half a lakh of rupees, and his estimated jummas would fall upon the areas at the following rates:—

Pergunnah.	Total area in acres.	Malgooza-ree area in acres.	Cultivated area in acres.	Jumma (estimated).	Rate on area.	Rate on malgooza-ree.	Rate on cultivation.	Remarks.
					Rs. A. P.	Rs. A. P.	Rs. A. P.	
Khutowlee ...	59,683	46,831	40,364	85,847	1 7 0¼	1 13 4	2 2 0½	Rates all very light.
Jowlee Jansut.	61,971	54,600	48,763	87,246	1 6 6¼	1 9 6¾	1 12 8½	

From my own independent notes and roughly-cast estimate made as I examined each estate of Khutowlee, I had put the total jumma at a slightly higher figure; but Mr. Cadell's notes and data, prepared with a minuteness which defies objection, show without doubt, in my mind, the proper results.

18. Whatever course it may be determined to take as regards the present assessment of the two pergunnahs now under consideration, our more official report to be submitted at an early date will be to the effect that they are totally unfitted for the permanent settlement by reason of the inadequateness of the jummas assessed and the consequent loss to the imperial revenue which would necessarily and immediately follow the declaration of that measure.

Memorandum by A. Cadell, Esq., *Assistant Settlement Officer, on the assessment of Pergunnahs Khutowlee and Jansut, in the District of Mozuffurnuggur, (dated Mozuffurnuggur, the 16th May* 1868).

Up to the present date Pergunnahs Jhinjhana, Thanah Bhowun, Shamlee, Khutowlee, and Jansut have been inspected, and full notes have been written regarding each village, eligible under the 80 per cent. rule for permanent settlement. The report regarding the three first-named pergunnahs is delayed until full information regarding the probable increase of irrigation shall have been received from the canal officers, and proposals regarding the permanent settlement of these pergunnahs can be submitted.

2. In the two last-named pergunnahs, it is believed that the present assessment is altogether unsuited for permanence, and that no modification with reference to fallow would secure to Government that share of the assets which is required.

3. In support of the assertion that the jummas of Pergunnahs Khutowlee and Jansut are inadequate, the following facts are noted:—

4. The assessments appear to have been based—

1*st*.—On leases and similar documents;
2*nd*.—On the putwarees' papers;
3*rd*.—On information supplied by zemindars.

5. The results procured from these three sources were checked by and compared with the "value assumed at average rent rates," from which, of course, the "value assumed at deduced revenue rates" was obtained. It would appear that these rates are those of Mr. Thornton, reduced to half assets; but the change which Mr. Thornton predicted (paragraph 24 of his report) has occurred, and the great increase in the proportion of the more valuable crops and the general improvement in agriculture, due to the Ganges Canal, have rendered these rates altogether unsuitable, and they cannot now be relied upon in the same way as those of the comparatively unchanged western pergunnahs. Mr. Thornton's rates too have been applied to a classification which differs very considerably from that for which his rates were framed.

6. The rent rates assumed in the two pergunnahs are—

	KHTUTOWLEE.		PERGUNNAH JANSUT.					
	KHUTOWLEE CIRCLE.		JANSUT CIRCLE.		JOWLEE CIRCLE.		KHEREE KORESHEE CIRCLE.	
	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.
Mesun ...	5 0 7½	3 5 3	4 1 6	3 6 11⅔	3 8 3	3 1 11¼	3 9 10	2 6 8⅓
Roslee ...	3 8 4	2 3 6½	2 13 10⅔	1 15 9¾	2 11 9	1 15 9	2 10 9	1 12 3
Dakhur ...	2 4 10	1 14 0⅔	2 10 5¾	1 12 11⅔	2 0 4½	1 7 1½	1 13 0⅔	...
Bhoor ...	2 13 6	1 6 8¼	2 9 9¼	1 6 3	2 7 4½	1 0 10½	1 13 7	1 5 4½

Appendix 2 shows generally to what a large extent these rates differ from those of the canal-irrigated pergunnahs to the west.

7. It would be both tedious and difficult to demonstrate to what extent each of the rent-rates assumed in the two pergunnahs is inadequate; but a few lines may be devoted to the rates fixed for that very important class of soil—irrigated meesun.

The assumed rent-rate for this soil of the first quality is in Khutowlee Rs. 5-0-7½. It is to be remarked that the irrigated meesun in this pergunnah is less than double, the sugar-cane area of the year of measurement being 8,010 acres meesun to 4,393 acres under sugar-cane. But looking at irrigated meesun, as if under this heading all irrigated manured land had been included according to Mr. Thornton's definition, the following would be a very fair rotation for four years :—

	Rs.	A.	P.
Sugar at Rs. 2-8-0 per kutcha beegah per acre	15	0	0
Mukkee at annas 12	4	8	0
Wheat at ⅔ share of 15 maunds at 30 seers per rupee ...	8	0	0
Cotton at 1 Rupee	6	0	0
	33	8	0
AVERAGE RENT PER ANNUM ...	8	6	0

8. With reference to this calculation, it is to be noted that the rotation allowed is half what the proportion of "meesun" to the cane crop justifies; that Rs. 3 would be a fairer average rate for sugar than Rs. 2-8-0; and that as regards the wheat crop, the zemindar's share rarely falls in this pergunnah so low as 16 seers, it is far more frequently 20;—the estimated produce, 2½ maunds per kutcha beegah, is extremely low for "irrigated meesun," and the price estimated, 30 seers, is lower than has been known for many years.

9. To look at the assumed rent-rate for irrigated meesun in another way, it is obtained by assuming one sugar-cane crop at a very moderate rate in three years, and the remaining two years fallow.

10. These objections apply with increased force to the rates of the Jansut Pergunnah, although the zubtie rates of this pergunnah are somewhat lower than in Khutowlee, or rather they are less uniform, there being more low rates which have not yet risen to the level of those obtaining in villages of exactly similar quality situated close by.

But this classification of the soils must always be imperfect, and it is not practically known to the people, nor does it influence the rent-rates. In the majority of estates in which money rents have been adopted, the land is classed as irrigated, unirrigated, and bhoor, if there be any sandy soil.

11. It will be seen from Appendix No. 3, showing the rents found to exist or to have existed in Pergunnah Khutowlee, that the rates assumed in future calculations,—Re. 1 per kutcha beegah irrigated, annas 8 unirrigated, and annas 4 bhoor,—are very moderate; indeed, Rs. 1-2 or Rs. 1-4 would be a fairer rate for irrigated land, and the rates assumed are so low that I look upon them as minimum rather than as average ones.

12. I have assumed the same rates for the two first classes in Jansut; for, although this pergunnah is inferior to Khutowlee and although rents are by no means uniform throughout the pergunnah, the inferiority is not so great as to render any change necessary, and the rates assumed for Khutowlee are so low that they may with perfect safety be applied to a slightly poorer pergunnah. Appendix No. 4 gives the rent rates that have been fixed in this pergunnah by private arrangement, and the rents found in such poor villages as Khanpore and Meeranpore show how moderate those are which have been assumed for the pergunnah.

The bhoor in Jansut is so extensive, and is situated so much in one corner of the pergunnah that a very low rate has been assumed—Re. 1 per acre, or annas 2-8 per kutcha beegah.

13. To turn again to Mr. Grant's rent-rates, they are obtained by dividing the results of the rent-rates by the area.

In Khutowlee per kutcha beegah wet, annas 11; dry, annas 6; bhoor, annas 3-9½.

In Jansut, wet, annas 8-7⅛; dry, annas 5-4⅜; bhoor, annas 3-1, involving, if my roughly assumed rates are fair, a very serious loss to the Government revenue.

14. The extent of this loss is shown by the following statement. The areas, irrigated and unirrigated, are taken from the pergunnah statements and tables, compiled from the measurement papers, which, as far as my experience goes, under-state rather than over-state the extent of irrigation. The jummas are those actually fixed, not always strictly in accordance with the assumed rates, but with reference to them, and generally more or less nearly in accordance with them.

PERGUNNAH KHUTOWLEE.

			Rs.	A.	P.
Irrigated by canal ...	16,632				
„ from wells ...	3,254				
	19,886 @ Rs. 6 per acre, or Re. 1 per kutcha beegah		1,19,316	0	0
Unirrigated land, excluding bhoor	14,441 @ Rs. 3 per acre, or 8 annas per kutcha beegah		43,323	0	0
Unirrigated bhoor ...	6,037 @ Rs. 1-8 per acre, or 4 annas per kutcha beegah		9,055	8	0
	Assets at roughly assumed rates ...		1,71,694	8	0
	Jumma at half these rates		85,847	4	0
	„ fixed		66,311	0	0
	DIFFERENCE ...		19,536	4	0

PERGUNNAH JANSUT.

Irrigated by canal ...	15,665				
„ from wells ...	2,929				
	18,564 @ Rs. 6 per acre, or Re. 1 per kutcha beegah	Rs.	1,11,384	A. 0	P. 0
Unirrigated land, excluding bhoor ...	16,455 @ Rs. 3 per acre, or annas 8 per kutcha beegah		49,365	0	0
Unirrigated bhoor ...	13,744 @ Re. 1 per acre, or annas 2-8 per kutcha beegah		13,744	0	0
	Assets at roughly assumed rates ...		1,74,493	0	0
	Jumma at half these rates		87,246	8	0
	„ fixed		58,578	0	0
	DIFFERECNE ...		28,668	8	0

so that, according to these calculations, Government has lost by the assessment of the two pergunnahs Rs. 48,204. This sum, large as it may appear, is, I feel assured, well within the mark; for some few estates the rates assumed may be too high, for very many, especially in Khutowlee, they are decidedly too low.

15. But the assumed rent and revenue rates were chiefly used as checks; very great reliance appears to have been placed upon the information derived from the three sources named in the 4th paragraph. Examples of each method of assessment are given.

Pootha, Pergunnah Khutowlee.

The jumma of this estate was fixed at Rs. 320, or Rs. 20 more than the reduced revenue rates and the lease indicated. Excluding the bhoor of this and a neighbouring but slightly inferior estate, Gungdharee, cultivated by the same caste of Rewas, and making a suitable deduction from the assessment of both estates, the jummahs fall as below:—

	Malgoozaree rate.	*Rate on cultivation.*
Pootha ...	... 1 13 11	... 2 0 4
Gungdharee ...	... 2 9 7	... 2 10 11

The Gungdharee jummah is certainly low; it differs in incidence from that of Pootha, simply because the agents of the Kurnaul Nawab were less cautious in Gungdharee than Hossein Ally Khan was in Pootha.

In the better village Pootha, the lease coincided with the assumed rent-rates, and was adopted as the basis of assessment. In the slightly inferior estate Gungdharee, the lease Rs. 2,460 exceeded by about Rs. 600 the assets indicated by the assumed rent-rates, and the lease was adopted without question or comparison.

The estate of Chundouree, in Jansut, had been given on a short lease for Rs. 450, giving a jumma of Rs. 225. The deduced revenue rates pointed to an assessment of Rs. 372. A jumma of Rs. 275, or nearly Rs. 100 less than the value at deduced revenue rates, was fixed. The present lease amounts to Rs. 905-15, so that the jumma was almost immediately reduced to 30 per cent., and the present rate is extraordinarily low If the owner would take the trouble to manage the estate himself at low rates, the rental might bear to the jumma the proportion of 100—25, and the rents would then be below the average.

16. As examples of too great reliance upon and the untrustworthiness of village papers, the following are given:—

In Bhangee, Pergunnah Khutowlee, the rent-roll showed an income of Rs. 2,300, a jumma of Rs. 1,100 was fixed.

In this village the Deputy Collector commuted the kind rates of Rajpoot tenants with rights of occupancy into the following fixed money rents:—annas 10 wet, and annas 6 dry. Almost at the same time rates of annas 14 wet and annas 8 dry were fixed by private arrangement for the Rewas, and even at these low rates the nikassees point to a jumma of Rs. 1,450. The rates of Re. 1 and annas 8 amply justified in the case of this village by far higher rents in the neighbourhood, give a jumma of close upon Rs. 1,900.

In Sherpore, Pergunnah Khutowlee, the assessment of Rs. 1,000 was grounded on the nikassees, and the assumption that the land was worth only annas 8 or 9 per kutcha beegah. The value of the land is more nearly shown by the fact that the Pootha people pay Re. 1 and the Bhansee people Re. 1-2 for the owner's seer. The Deputy Collector fixed annas 12 wet, annas 6 dry, and annas 3 for bhoor.

The land of this village is considered to be of very first class quality, and cultivators are plentiful in the neighbourhood. A jumma of Rs. 1,750 would be most moderate, and the nikassees, which have now reached the sum of Rs. 2,700, would certainly before this have amounted to double the jumma suggested, had it not been kept down by the low rates fixed for tenants with rights of occupancy by the Deputy Collector.

Since last settlement the irrigation of this estate has increased, solely owing to the canal, from 6 acres to 583: the former jumma was Rs. 733, the present one is Rs. 1,000.

In Munsoorpore, Pergunnah Khutowlee, the cultivation has increased since the former settlement by 100 acres, and the irrigation by 585 acres. The jumma was raised from Rs. 1,959 to Rs. 2,350 in accordance with the rent-rates *and other estimates*. There are in this very fine estate, according to the No. II statement, 901 acres irrigated, 491 acres ordinary dry land, and 167 acres bhoor. Rents range very high, and Re. 1-2 is a fair average wet rate, and dry bhoor together are let at annas 7 or 8 per kutch beegah. Even the nikassees show a rental of Rs. 6,500 for the khalisa, and the true income must be well over Rs. 7,000.

In Jowlee, Pergunnah Jansut, the cultivation has since last settlement increased by 587 acres; much of this is probably bhoor, but the great addition to the capabilities of the estate is due to the fact that, owing to the opening of the Ganges Canal, the irrigation has increased from 22 acres at Mr. Thornton's settlement to 859 acres at this one. This enormous increase of 837 acres to the area under irrigation, added to the large increase to the cultivation, is represented by an addition of Rs. 390 to the jummah, which rises from Rs. 1,510 to 1,900.

Of this estate it is written in the No. III statement—"Taking the assets at the lowest estimate, that founded on the village papers, they amount to between Rs. 3,900 and 4,000, which allowing for cesses would raise the demand to Rs. 1,900. In order to suit this *jummah*, the Deputy Collector fixed the following rents:—

For Syuds, 8 annas wet, 4½ annas dry, 2 annas bhoor.

For other castes, 9 annas wet, 5 annas dry, 2½ annas bhoor.

Hereditary cultivators can in this way let their land for about double what they pay to the zemindar—a very moderate rent-roll would be from Rs. 6,000 to 7,000; eventually it can hardly fail to exceed the latter sum.

In Koorkeelee Futeh Ali, Pergunnah Jansut, the village papers appear to have combined with the rent-rates in giving the jumma at Rs. 450. The former jumma was Rs. 427; but at last settlement there was only one well for drinking purposes between this and the neighbouring mehal, and there was no irrigation. Now 319 acres are entered as irrigated, leaving 4 acres nominally unirrigated.

The Deputy Collector fixed a rent-rate of annas 10-6; this has in some cases been raised to annas 12. The nikassee at these rates gives an income of over Rs. 1,400, which at the Re. 1 and annas 8 rates would rise to Rs. 1,926.

The neighbouring mehal of Koorkeelee Talib Ali, with 242 acres irrigated and 65 dry, is assessed at Rs. 400; the increase of irrigation by 242 acres having caused a rise in the jumma to the extent of Rs. 50 from Rs. 350 to 400.

17. I now come to instances of too great confidence placed in the statement of zemindars and others.

Of Juhangeerpore, Pergunnah Khutowlee, it is written—"That the total rental is stated by the Putwaree at Rs. 1,560; by the owner, Hoosain Ali Khan, whose statements are generally correct, at only Rs. 1,300." A jumma of Rs. 750 was fixed, although the deduced revenue rates, always very low, pointed to one of Rs. 1,030.

Nikassees.

Years.			Rs.	A.	P.
1263	...	...	1,597	8	0
1264	...	...	1,591	13	0
1265	...	...	1,595	8	6
1266	...	...	1,593	14	6
1267	...	...	1,596	11	6
1268	...	...	1,617	14	0
1269	...	...	1,617	14	0
1270	...	...	1,901	6	9
Year of Settlement.					
1271	...	...	1,896	9	6
1272	...	...	1,856	9	3
1273	...	...	1,817	9	3
1274	...	...	1,813	15	0

The nikassees of the khalisa for 12 years show a different state of affairs, and how much dependence is to be placed on the statements of an individual who has, there can be no question, influenced to an extraordinary extent the assessments in these pergunnahs. The irrigation is greatly under-stated as the canal records show: but even taking the areas of the measurement papers, a jumma of Rs. 1,250 would have been moderate.

In Nuglah Boozoorg, Pergunnah Jansut, the jummah was fixed at Rs. 1,300, owing, it would appear, to the fact that the zemindar's agent stated the assets to be Rs. 2,500, and that the village papers confirmed this.

The former jumma of this estate was Rs. 1,090, but since last settlement the cultivation has increased 328 acres, and the irrigation, owing to the opening of the canal, from 5 acres to 745, according to the No. II statement; in reality nearly 1,000 acres can be watered from the canal.

To show the value of nikassees, I give those of this village for five years—

			Rs.	A.	P.
1270	*Fuslee.*	...	1,290	1	6
1271	„	...	3,262	10	9
1272	„	...	3,024	6	6
1273	„	...	3,920	13	0
1274	„	...	4,061	13	3

1270 *Fuslee* was the year of settlement. The great rise, notwithstanding the fall of prices, is due to the fact that the former Putwaree, whether afraid of the consequences of his false nikassees, or as he himself urged, unable to contend with the zemindars, procured an exchange.

Under the new Putwaree, it may be because he was stronger than his predecessor, or perhaps because the crisis being past less care was given to the nikassees by the zemindar, the rent-roll rapidly increased. At the most moderate estimate the assets cannot be under Rs. 5,500.

The malgoozaree and cultivated rates of this estate are less than those of Manout, a well-less, canal-less, uninhabited estate on the sand ridge, unquestionably the worst in the pergunnah and probably in the district. Nuglah Boozoorg and Jowlee, already mentioned, are owned by the same proprietor.

18. In addition to the estates particularly noticed, there are many others to which, equally with the above, attention might have been called.

Such are in Khutowlee, Booarah Kullan, Bursoo, Johorah Tubeetah, Chandsamund, Islamabad, Serai Russoolpore, Fuheempore, Kulan, Raeepore Gaonree.

In Jansut, Untwarah, Untee Busaeeh, Bulheree, Bere Asa, Remora Fissung, Jansut, Chougaon, Dhasree Ratour, Katka, Khulwara, Mahelkee, Muwee Sadat, Nuglah Churhao, Nuglah Mobarick.

19. The rent-rates fixed by Deputy Collector Vicar Ali Beg, in commutation of those paid in kind, have been frequently mentioned. It is evident from the records that that officer fixed his rent-rates mainly on the principle that it was necessary that the rent-roll should more or less nearly double the jumma.

This principle led him into the most strange neglect of the plainest indications of what a fair rent ought to be. Thus in Bursoo, where the old irrigated rate (abandoned solely, because the zemindar was discontented with it when prices rose in the famine year) was Rs. 1-4 per kutcha beegah, the Deputy fixed annas 13. In Pubeetah, again, annas 10 wet, annas 6 dry, were fixed for the Rajpoots of the village, although one shareholder had just arranged a rent-rate of annas 14 with Rajpoot cultivators of a neighbouring village. The value of the land was shown a year later by other Paheekasts gladly agreeing to a rent-rate of Rs. 1-2.

In Nuglah Kubeerpore, annas 14 wet, and annas 9 dry, were fixed, although before the settlement there was an all round rate of Re. 1 in one puttee, in no way superior to the other.

20. In this way, where money rents were applied for and obtained, the zemindars have hitherto received but little benefit from the lightness of the demand. Indeed, it is notorious that in villages such as Jowlee, the landowners have been heavy losers. They little thought when manipulating the rent-rolls that the very papers, prepared in order to obtain a low jummah, might be used as the basis of equally inadequate rent-rates.

21. It is to be feared that the result has been to induce a state of feeling between landlords and tenants with rights of occupancy, very much to be regretted. There have hitherto been very few suits for enhancement; such suits have been discouraged, the settlement has not been sanctioned, and meanwhile the landlords bide their time, afraid in most cases to do anything which should tend to prevent the present assessment being made permanent.

22. The preceding pages have been occupied wholly with details. It may be useful to glance for a moment at the present state of Khutowlee and Jansut, and the most prominent changes which have taken place since last settlement. "The immense change in the condition of a sandy and unirrigated tract, such as is the great part of the district influenced by the canal," to which Mr. Thornton looked forward, has occurred, and has amply justified his expectations.

The increase of irrigation in these pergunnahs has been very great, and a general impulse has been given to agriculture. Khutowlee now grows more sugar in proportion to its cultivated area than any pergunnah in the district, while Jansut is in this respect not far behind Shamlee, and is ahead of such a pergunnah as Kandla (see page 16, new report).

The Commissioner's report, page 8, shows the increase both of cultivation and irrigation to be enormous. As far as I have been able to make out, taking the No. II statements as the record of irrigation at the time of settlement, the increase in the two pergunnahs is only slightly over 23,000 acres; but even this amount, taken with the addition of 9,140 acres to the cultivation, implies an increase of assets to the extent of about a lakh of rupees at the most moderate computation.

23. Even if it were granted that there have been no improvement in the agriculture, no rise in prices and in rents, there would still remain, after deducting the 16 per cent. which Government has relinquished, a very large increase to the assets of the two pergunnahs, and of this increase no adequate share has, on the occasion of the recent revision, been allotted to Government.

24. This memorandum is necessarily wanting in many respects; but it is hoped that a more complete report will be ready in a few weeks. I feel pretty confident of the general correctness of my assertions, and hope to be able on a future occasion to state them with greater clearness, and to support them more fully than has now been possible with the short time at my disposal.

APPENDIX I.

Table showing the incidence of the present assessment in the various Pergunnahs of Zillah Mozuffernuggur.

Pergunnahs on Eastern Jumna Canal.	Rate on acre of area.	Rate on acre of malgoozaree.	Rate on acre of cultivation.
	Rs. A. P.	Rs. A. P.	Rs. A. P.
Bidoulee, Mr. Colvin ...	0 8 5¼	0 11 4	1 6 8
Jhinjhana „ ...	0 15 9⅓	1 4 7½	2 4 3½
Thana Bhowun „ ...	1 0 7	1 7 3	1 1
Shamlee „ ...	1 13 8	2 4 5½	2 10 3
Kyrana „ ...	0 14 6½	1 0 8¼	1 8 10½
Kandla „ ...	1 10 7½	1 15 7½	2 4 5

Pergunnahs in Hindun Doab.	Rate on acre of area.	Rate on acre of malgoozaree.	Rate on acre of cultivation.
	Rs. A. P.	Rs. A. P.	Rs. A. P.
Churthawul, Mr. Colvin ...	1 0 8¾	1 3 0¼	1 6 3
Bugrah, Mr. Martin ...	1 7 3¾	1 10 7¼	1 15 3½
Shikarpore, Mr. Keene ...	1 9 10	1 14 4¾	2 2 1¼
Boorhanah „ ...	1 6 2½	1 10 8¾	1 15 8

APPENDIX II.

Assumed rent-rates in Pergunnah Shamlee.

	U.	R.	I.	R.	U.	D.	I.	D.	U.	B.	I.	B.	U.
Shamlee Circle ...	3 6	6	0 0	4	2 4	3	13 10	2	14 2	2	0 7	1	8 0
Kodanah ...	6 10½	6	6 6	4	12 0	4	6 6	3	9 4	3	15 6	1	14 10½
Bantee Kheree ...	0 0	4	11 0	3	6 0	3	8 0	2	12 0	1	12 0	1	4 0
Bhynwah ...	.....	4	12 0	3	8 0	7	8 0	5	4 0	2	3 0	1	11 2

Assumed rent-rates in Pergunnah Kandla.

Khandla ...	6 0	6	12 0	5	2 0	6	0 0	4	0 0	3	15 6	1	14 10½
Purasowlee ...	14 0	4	14 0	3	10 0	3	8 0	2	8 0	1	8 0	1	4 0

In the canal irrigated villages of Shikarpore, Mr. Keene's revenue rates were—

Irrigated ...	...	...	3	10	0	Rent-rates ...	7	4 0
Unirrigated ...	...	...	1	8	0		3	0 0

In Kandla	Irrigated.				Unirrigated.				Irrigated.				Unirrigated.			
	R.	I.	R.	U.	M.	I.	M.	U.	D.	I.	D.	U.	B.	I.	B.	U.
Cis-Kirsunee ...	3	8	4		1	4	2		8	8	0		6	6	0	
Trans-Kirsunee ...	3	9	9		1	12	6		6	12	0		5	14	0	

APPENDIX III.

Rent-rates per kutcha beegah (about one-sixth of an acre) found to exist in Pergunnah Khutowlee, Mozuffernuggur.

	Irrigated.	Dry.	Bhoor.	All round.
Akberpore, two-thirds wet, and one-third dry, leases given at	...	...	...	1 0 0
Ajeetpore, all round, rates for irrigable 0-13-6, Re. 1-0-0, and	...	...	...	1 1 6
Islamabad (in maafee)	...	...	...	0 13 0
Bursoo, former rates, dry, includes bhoor ...	1 4 0	0 7 6		
		0 6 6		
Bhopra Hoseinpore (few money rents, butaee enormous)	1 2 0	0 8 0		
Bhangee, four-fifths wet and one-fifth dry for Rewas, fixed when zemindars were in difficulties	...	...	...	0 14 0
Bhainsie four-fifths wet and one-fifth dry (old rate, see No. II. Statement) ...	...	...	...	1 4 0
Beghurzpore, fixed at settlement about equal to Re. 1, 7 annas, and 3 annas ...	...	...	...	0 5 9
Tubeetuh Rajpoot Paheekashts fixed at settlement, irrigable	...	...	...	0 14 0
Tigaen Lohars, fixed after settlement ...	...	...	...	1 2 0
Jahangeerpore, old rate equal to Re. 1 wet, and 7 annas dry	...	...	...	0 10 0
Khanjehanpore	1 0 0	0 10 0		
Raepore, mostly irrigable	...	...	...	1 2 6
				1 1 6
				1 0 0
Roostumpore, nearly all irrigated ...	...	...	...	1 0 0
Sutheree, rents chiefly in kind, some Shikmees pay	...	...	...	1 0 0
Sirdhun in the maafee	...	...	...	1 0 0
Serai Russoolpore, for small patches ...	2 0 0			
Before settlement in proportion to irrigation	...	...	...	1 3 0
				0 12 0
Sontuh land when it is to be had is quickly taken up	2 0 0			
Sherpore, for irrigated land	1 2 0			
	1 0 0			
Khutowlee	1 0 0			
Khalaoda Kulan	1 1 0	0 8 6	0 5 4	
Girdhurpore, in one puttee	...	...	...	1 2 0
Loona, paid by Paheekashts, mostly irrigable	...	...	...	0 14 0
Mohuodeenpore	1 0 0	0 12 0	0 4 0	1 0 0
Munsoorpore money rents 1-9-0, 1-8-0, 1-4-0	1 2 0	0 8 0		
Average dry includes bhoor	...	0 7 7		
Naola	...	...	...	1 0 0
Ibraheempore, lease-holders give the land, half of which is dry, at	...	...	...	1 0 0

APPENDIX IV.

Rent-rates per kutcha beegah (about one-sixth of an acre) found in Pergunnah Jansut, Mozuffernuggur.

	Irrigated.	Dry.	Bhoor.	All round.
Antee, except 7 or 8 acres, at as. 5 per kutcha beegah	...	...	...	0 12 0
Bazeedpore, tenants-at will, as. 12 to ...	1 2 0	0 10 0		
Bulchree	1 4 0			
Punmaolee for Brahmins and Sanees ...	1 0 0	0 8 0	0 6 0	
„ for Rajpoots in general ...	0 14 0	0 7 0	0 5 0	
„ for Rajpoot Mocuddums ...	0 12 0	0 6 0	0 4 0	
Talruh, hereditary Paheekashts for distant fields	0 15 0	0 10 0		
	0 14 0			
	0 12 0			
Tissung, Paheekashts pay about equal to ...	1 0 0	0 8 0		
Jansut, for Barah land, Rs. 1-12-0, Rs. 2, and	2 4 0			
These rates have been unchanged for some 40 years, those in kind cannot be less than Rs. 5 per kutcha beegah.				
Jowlee, Shekumee cultivators pay as. 13, as. 14, and	1 0 0	0 6 0	0 4 0	
Khanpore, tenants with rights of occupancy as. 10-6 fixed	1 0 0	0 8 0		
Koorkulee Futteh Ali, 24-2 wet, 65 dry, by Vicar Ali Beg, risen to as. 12 ...	...	...	...	0 12 0
				0 10 6
Sadpore, as. 14, and	0 15 0			
Kowalbarah, rates formerly fixed Rs. 1-4, 1-8, and 1-12, now	2 0 0			
Kowalee uninhabited	1 2 0			
Munout, worst estate in pergunnah, if not in district	...	0 6 0	0 3 0	
Muntowree Goojurs, no irrigation ...	...	0 7 0	0 3 0	
Meeranpore, 87 acres wet, 187 dry ...	...	...	...	0 14 0
Nuglah Boozoorg, Paheekashts pay for land too distant to be manured	0 12 0	0 7 0		
Nuglah Kubeerpore, before settlement ⅓ dry	...	...	...	1 0 0
	1 0 0			0 14 0
Nuglah Churhao, uninhabited				

APPENDIX No. V.

Pergunnah Khutowlee.

Former jumma ...	65,913	Present jumma ...	66,311	
16 per cent. ...	10,560	Difference between former jumma and 16 per cent.	55,353	
			11,958 × 2 assumed increase of assets from all causes ...	23,916

Pergunnah Jansut.

Former jumma ...	56,152	Present jumma ...	58,578	
16 per cent. ...	8,960	Difference between former jumma and 16 per cent.	47,192	
	47,192			
			11,386 × 2 assumed increase of assets from all causes ...	22772
			TOTAL ...	46,688

Memorandum by CHARLES GRANT, Esq., *Officiating Secretary to the Chief Commissioner of the Central Provinces, on statements regarding the assessment of part of the Mozuffernuggur District, dated 17th June* 1868.

1 should begin by avowing that the assessment of Mozuffernuggur was designedly moderate. Mr. Forbes rightly says that the assessing officers tried honestly to carry out the Saharunpore rules; though I must deny his qualifying statement that they "resigned themselves, leaving unnoticed and unheeded the facts and reliable data which were then, as now, open to them and patent to all."

2. I do not like to lay much stress on the personal bearing of this remark, except in so far as it must tend to depreciate any estimate of our official work. But I may be permitted to say that if Mr. Forbes starts with so contemptuous a view of our exertions, it is not likely that he should give much consideration to our opinions. Accordingly, it is almost curious to me to notice how tables which cost me time and trouble are set aside by lists of unconnected figures, and how conclusions which, if erroneous, were not hasty, are dismissed with a few words of easy superiority. I feel that I may appeal to Sir W. Muir himself, who was then Senior Member of the Sudder Board of Revenue, to testify that neither exertion nor such intelligence as I had were spared in making these assessments, and that, if it were only for the labor which had been expended on them, my conclusions would deserve something better than to be dismissed with a sneer.

3. The only other point which I will notice in Mr. Forbes' memorandum is his remark that the former settlement of Mozuffernuggur was moderate. This was not the case as regards some parts of the Khutowlee Tehseel, which was assessed partly from Meerut, partly from Mozuffernuggur, with the result that great inequalities crept in, and that in one pergunnah alone (Bhookurkeree) 45 per cent. of the land had changed hands in the course of the settlement. This consideration had weight with me, but there were others which influenced me perhaps even more in determining the new assessment.

4. The present settlement of Mozuffernuggur was made under peculiar circumstances. The famine of 1861 has left marked traces throughout the district. In India generally it had awakened a discussion on our system of settlements, which brought prominently to light their effect in producing proprietary transfers. I think I am not wrong in saying that, under these influences, there grew up a very strong feeling in favor of moderation, even at some immediate sacrifice of revenue. The settlement was carried out accordingly on a scale of assessment only slightly above the admitted standard of half assets.

5. Some years afterwards the neighbouring district of Meerut was assessed under the superintendence of Mr. Forbes. By this time the lessons of the famine had perhaps lost some of their vivid effect. The extension of the railway, the development of the Ganges Canal, and the general stimulation of the prosperity of the country, which resulted last year in a season of unknown ease and prosperity, had brought in a new and more sanguine phase of public opinion.

6. It would seem not unnatural that officers imbued with these views and honestly desirous to increase the revenues of the State, should be inclined to condemn summarily an assessment made under circumstances so different; and I believe every Settlement Officer will agree with me that if there be the slightest tendency, however unintentional, to a forgone conclusion, the figures and facts to support it will flock in almost of themselves. There is no point, for instance, which is more strongly insisted upon, and seemingly better proved, in the old North-Western Provinces settlement reports than the moderation of the assessments. And yet it is matter of revenue history that some of those which were not the least ably supported by figures and arguments have the most signally broken down.

7. I think, then, that I can show cause for some hesitation in accepting the calculations on which so violent an enhancement as Rs. 50,000 in Rs. 1,25,000 is recommended. But before examining the figures, I may, perhaps, be permitted to notice one point which strikes me very strongly. The rent-rates entered in Mr. Cadell's tables are those now leviable; but it is nearly six years since the settlement was made in a time of doubt and difficulty. Prices* had not then risen for thirty years, and there was no sufficient ground for confidence in any immediate rise beyond that which would naturally result on the definition of the Government demand for a long terms of years. But since then the country generally has made great strides, and the natural growth of rents must have been quickened by the stimulating atmosphere of prosperity.

* In proof of this, I beg leave to refer to the table quoted in my report on Pergunnah Bhookurkeree. Mr. Martin, I see, differs from my conclusions, which were, however, accepted by Mr. Colvin after an independent investigation, though he at first doubted them. Mr. Martin's calculation seems to me erroneous. To allow for the decreased value to agriculturists of produce sold at *harvest* rates, he deducts 10 per cent., *not* from the *price* of grain, but from the number of seers sold for a rupee. This, of course, would make the harvest price higher, instead of lower, than the ordinary market rate.

8. It would surely be an abnegation of the first principles of our system of settlement to revise an assessment in accordance with the rent† of six years afterwards, which had been influenced not only by unforeseen circumstances, such as the American war, but by the security engendered by renewal of engagements with the States. His Honor the Lieutenant Governor has himself noticed this point, and has instructed the Meerut officers not to raise assessments in consequence of improvements effected *since* the settlement; but this principle is so far lost sight of by the gentlemen who are to carry out his instructions that ***the statistics on which Mr. Cadell's revised rates are founded are actually derived from present rents.***

9. These statistics are collected in two tables,—one attached to the 14th paragraph of Mr. Cadell's memorandum, and the other forming his Appendix No. 5. In the first of these tables the assessment is tested by assumed rates, based on rents as found existing in certain villages or parts of villages. I cannot estimate the fairness of these rates, for the amount of land assessed to them is not given, nor is any attempt made to strike an average from them. But even taking the figures as they are, I should conclude from them that Mr. Cadell's rates were too high for Jansut. It will be noticed that he gives an equal place among other rates to the garden rents in the town of Jansut, which form so infinitesimal a fraction of the whole cultivated area that if an average had been struck, they would have been entirely without influence on the result. But in a disconnected table of this kind, the rate for 20 acres catches the eye as prominently as that for 2,000.

10. And as by a selection of figures almost anything can be proved in settlement matters, this statement carries no conviction to my mind, especially as my assessment was made on tables of money rates far more copious, and in form more exact, which Mr. Cadell does not seem to have seen.‡ But it is possible that Mr. Cadell's figures may be mere indications of fuller researches, and that he has based his conclusions on true averages, drawn from a really wide field. Even in this case there would still remain the, to me, fatal objection that his tables represent the state of rents six years after the assessment statistics were prepared, and that those six years have been a period of marked progress throughout India. And I would respectfully, but earnestly, solicit that the basis of so delicate an operation as revisal of assessment should be the state of things prevailing at the time of the assessment. I am sure His Honor will acquit me of

† I assume that there has been a general rise of rents:
(1.) Because in the examples given by Mr. Cadell, rent-rates are invariably higher than those found by me in the same villages six years before.
(2.) Because prices throughout India have increased rapidly of late years.

‡ I see that neither this table nor any of my statements are in the printed report. It was, I think, compiled under my directions by Fusl Azeem, then my reader, now a Tehseeldar in the Meerut District. It was translated and sent in with my report on Khutowlee, in the 3rd paragraph of which it is referred to as Appendix A.

any personal motive in attributing great importance to his condition; for his knowledge of the native character will enable him better than any one to appreciate the risk of misinterpretation, to which even an apparent departure from agreements must be subject.

11. The next table (Appendix V.) seems intended to confirm the conclusion that the assessment of these pergunnahs might be increased by nearly half a lakh of rupees. The method by which this result is attained was for some time incomprehensible to me; but from paragraph 23 of the memorandum, it would appear that Mr. Cadell had supposed that a deduction of $16\frac{2}{3}$ from $66\frac{2}{3}$ (reducing the old to the new scale of assessment) was equivalent to a deduction of 16 per cent. instead of 25 per cent. If I have wrongly attributed so curious an arithmetical error to Mr. Cadell, I must ask his pardon; but I cannot account for the computation in any other way. The remainder, after deduction of 16 per cent. from the old assessment, is probably intended to represent an assessment on the new scale, supposing circumstances had remained unchanged. From this point I fail to follow the calculation any further. The deduced amount is subtracted from my assessment, and the difference is multiplied by two. The result is considered to represent "the assumed increase of assets from all causes;" and it really does coincide very nearly with the calculation in paragraph 14. If the erroneous percentage be corrected, the result will of course be vitiated; but the difficulty may be got over by substituting $1\frac{1}{2}$ for 2 as the multiplier in the last stage. There seems to be just as much reason for using the one figure as the other.

12. I do not think much value can be attached to these calculations, even when they are made on correct data and true arithmetical principles, for they depend a good deal on assumption. But to show how easy it is to prove anything in this way, I append a similar calculation in favor of the present assessment—

Former jumma of the two pergunnahs	Rs.	1,22,065
Deduct 25 per cent., being difference between $\frac{3}{4}$ and $\frac{1}{2}$ scale of assessments	,,	30,516
Difference, representing assessment on new scale, supposing circumstances had remained unchanged ...	Rs.	91,549
Add for 23,000 acres of irrigation at 12 annas* per acre	,,	17,250
	Rs.	1,08,799
Add for 9,000 acres of new cultivation, mostly bhoor, at Re. 1 per acre	,,	9,000
	Rs.	1,17,799
The new assessments	,,	1,24,889
Therefore the difference	Rs.	7,090

is the amount by which my assessment exceeds half assets.

13. I will now go on to examine Mr. Cadell's remarks on individual villages, premising by the admission that there are three conditions under which my assessments may undoubtedly be found low :—

(1.) In Jât villages so highly cultivated that even a half-asset rate would bring the assessment much above the average of similar villages. As the increased fertility in these cases was due to extraordinary expenditure of labour and capital, I thought it fair, as a rule, not to exceed half of the actual assets. One bad harvest, or a murrian among cattle, may at any time break down the capacity of the brotherhood for paying exceptional rates.

(2.) In poor Syud-villages, from which the revenue had been collected with much difficulty, I generally limited my enhanced assessments to one-half of actual assets, even if

* This is an addition of about 50 per cent. to a full dry rate. It is sufficient when it is remembered that much of the land recorded as irrigated is really only irrigable. Much of it is seldom irrigated, some never.

the rate of assessment thus obtained was below the average of similar villages. I felt that any other course would have broken down the villages entirely; and though this might have resulted in introducing wealthier landlords, I thought it very inexpedient politically.

(3.) In villages belonging to Hossein Ali Khan of Jansut, I may have been misled by his apparent frankness. I do not think that he mis-stated rents, or that his rents were, as a rule, below the average, but that, having both capital and intelligence, he would have raised them above the average had it not been for the coming settlement. He has probably done so by this time.

14. It will be noticed that nearly all the villages picked out by Mr. Cadell come under one or other of these classes.

The first village named is—

(*a*).—*Pootha, Pergunnah Khutowlee.*—The assessment is called low, because it is lower than that of Gundharee, which is stated to be a slightly inferior estate.

From my notes I find that, on the contrary, Gundharee is the superior estate of the two, both in soil, produce, and strength of cultivators. Pootha includes some "bhoors," or sandy tracts, in its area. Gundharee is nearly all of first class quality. Pootha, when I visited it, was tenanted by four or five families only. Gundharee had a fine Ruwa village, and the area was covered with sugar-cane.

(*b*).—*Chundouree, Pergunnah Jansut.*—When I assessed this village, it had just been settled with cultivators at considerable expense. It was let to them for Rs. 450, and there was then no ground for anticipating any general rise in rents. In the hands of an ordinary man this village would probably not have paid so much. I maintain that at that time the assessment was fair, and that if the estate were in other hands, the jumma might still be a full one.

(*c*).—*Bhangee, Pergunnah Khutowlee.*—In this village I found (from the villagers of this and neighbouring villages) that a resident Ruwa cultivator had taken the lease at Rs. 1,300, gradually rising to Rs. 1,700. At the latter sum he broke down. I submit that, under these circumstances, Rs. 1,100 was an ample assessment.

(*d*).—*Sherpore, Pergunnah Khutowlee.*—I assessed on the rates I found, which were up to the average. Mr. Cadell says that Rs. 1-2 per kutcha beegah is now paid for the owner's seer. This may be, as the seer is generally the best part of the estate. I can only say that these were not the rates at the time of the assessment.

(*e*.)—*Munsoorpore, Pergunnah Khutowlee.*—When I assessed this estate, the best portion of it was let at the rate of 12 annas per kutcha beegah. Other rents were all lower. They must have risen very much to reach the level indicated by Mr. Cadell. I am satisfied that my assessment was not low on the then scale of rents.

(*f*.)—*Jowlee and* (*g*.) *Koorkeele, Pergunnah Jansut.*—I have no written information about these, but I remember well the condition of Jowlee: the area was mostly sandy; the owners were impoverished Syuds; the demand (Rs. 1,510) was collected with the utmost difficulty, and in raising it more than 25 per cent., to reach half actual assets, I felt I was stretching my assessment to the utmost safe limit.

(*h*).—*Jahangurpore, Pergunnah Khutowlee.*—Mr. Cadell has here seemingly given the whole rental of the estates, of which one-fourth is revenue-free. The assets on account of this portion would, of course, be deducted. My deduced rates gave a jumma of Rs. 1,030, but in the case of an uninhabited estate like this, I generally found that a deduction of 25 per cent. from average rate was fair. Further, I found the rate of rent where money was paid at all to be only seven annas per kutcha beegah. Mr. Cadell advances no other grounds than these, which I have shown are anything but unquestionable, for his assumption that a jumma of Rs. 1,250 would have been moderate.

(*i*).—*Nuglah Boozoorg, Pergunnah Jansut.*—When I visited this estate, which is principally sandy and poor, the rates were purposely low to induce new cultivators to settle, the old village having been cut off from the body of the estate by the canal. Thus the rate in kind was only one-fourth. The rental really was low, though, as I have now no means of explaining the sudden augmentation of rental pointed out by Mr. Cadell, I cannot say that I was not deceived in this instance.

15. I do not pretend for a moment that I have not made many mistakes. It is impossible to avoid them in assessing on rents fixed in kind. But I hope I have shown that I have had reason for what I have done in the cases quoted, which may be supposed to be most prominent of their kind. In several of these cases rents have undoubtedly risen so as to alter materially the ratio of assets to revenue demand, but when the assessments were made, it was not generally anticipated that rents would rise much; I believe I may refer to the records of any settlement made about that time—as, for instance, Boolundshuhur—for the confirmation of this assertion. On the whole, the more I think over the question, the less do I feel convinced by any argument which has yet been brought forward that, with regard to the scale of rents then prevailing, or to the state of public opinion by which I was influenced, my assessments were unduly low. It is certainly shown that the assessment might be enhanced on the basis of rents as they now stand, six years after the assessment; and it probably can be shown, as I will readily admit, that I have made isolated mistakes in estimating the money value of estates whose capabilities were concealed no less by the system of grain rents than by the interested arts of landholders; but this is perhaps the safest direction which my short comings could have taken.

16. For myself, I have never regretted that events should have thus shaped my first attempts at assessment. The lessons of moderation which I then learnt theoretically have since been impressed on me far more forcibly by practical examples. I have seen the history of one valley marked by alternating epochs of distress and relief according to the views of successive Settlement Officers, and finally exhibiting a development almost equivalent to a new life under the quickening influence of an assessment which was at first condemned as unmindful of the interests of the State; and while surrounding districts, once thought far more prosperous, have so broken down at the first breath of difficulty that even their since lightened assessments have hardly been maintained, the only question in the re-assessment of these valley districts has been where and how to limit the enhancement. Thus, in the one instance which has come under my notice of the working of a really light assessment, timely moderation has been repaid tenfold, not only indirectly in the prosperity of the people, but directly in increased revenue, and, mortifying as it is to me to learn that the work in which I took so deep an interest has been set aside, I am at least thankful to feel that instinct and surrounding opinion should have saved me from an error of which experience has since shown me the full danger.

Memorandum by S. N. MARTIN, Esq., *Officiating Judge of Furruckabad, dated* 18*th June* 1868.

The charges preferred by Messrs. Forbes and Cadell against the Mozuffernuggur settlement are these—

1*st*.—Indequacy of jummas based on unreliable data.

2*nd*.—Incorrect rent-rolls made subsequent to the promulgation of the low jummas, with the object of making the two fit into each other.

3*rd*.—The discouragement of enhancement of rent suits by district officers.

2. The first objection is a matter of opinion, but the other two objections are incorrect. The assumed rent and revenue rates for No. II statements were taken mostly from Mr. E. Thornton's circle rent-rates of the last settlement, to which I added one-fourth for the increase in value of agricultural produce generally.

My reasons for taking Mr. Thornton's irrigated and unirrigated rates were these,—they were found to work well in practice, and as the irrigation had increased since the introduction of the Ganges Canal, I was of opinion that the irrigated rates, applied to areas which had formerly been dry but now under irrigation, would represent approximately the augumented rents received by the landlords.

These standard rates I checked by local investigations, by any leases that existed, by summary rates, and by information gleaned from the Putwaree's papers.

3. The difficulty we had to contend with was the prevalence of rents in kind, and the impossibility of guaging correctly the value of the produce received by the landlord in the shape of rent.

Mr. Thornton had made a very extensive appraisement of the produce of irrigated and unirrigated lands, covering some thousands of beegahs, and from this had deduced some very useful standard rates of produce, which I was of opinion could scarcely be improved upon. These two criterions—1*st*, the circle rent rates, and, 2*ndly*, the results of the produce appraisements applied to the area under cultivation—I found to be of great assistance in making my assessments. It may be that, compared with the rates adopted in Meerut, I pitched my standard too low, but I certainly spared no efforts in endeavouring to ascertain what were the average receipts of past years, and as far as I could judge, I assessed the revenue at 10 shillings in the pound.

4. Mr. Forbes is wrong when he assumes that the assessing officers confined themselves to the instructions in that portion of the Saharunpore rules, to the effect that Government does not look to any increase on the present demand. No such idea was entertained by myself or my subordinates. The fact is that the revenue fell considerably in the pergunnahs to the west and east, like Bidowlee and Gordhunpore, both abnormal in their conditions, and in the dry tracts between the rivers Hindun and Kalee Nuddee, *e. g.*, Pergunnah Churtawal; consequently the enhancement made in the canal-irrigated pergunnahs only went to equalize the deficiency caused by those decrements, without exhibiting any increase in the total of the district. Also, some allowance should be made for the reduction in the proportion of the Government jumma to the assets.

5. In paragraph 6 of his memorandum, Mr. Forbes seems to think that the Eastern Jumna Canal, with its network of irrigation channels, was introduced subsequently to the last settlement of 1840-41; whereas the pergunnahs bordering on that canal were highly irrigated before Mr. Thornton came into the district.

6. The Khutowlee Pergunnah, visited by Mr. Forbes, happens to be one of those that was the most flourishing before the introduction of the canal, having fertile soil and a fair proportion of well-irrigation. I am aware that Mr. C. Grant, Junior, was guided a good deal by the rent leases he found prevailing in many of the estates owned by that intelligent landlord Syud Hoosein Ally Khan, Honorary Magistrate of Jansut. With my permission Mr. Grant, after making careful local enquiry in each village, used these cases as a check upon other estimates. In so doing Mr. Cadell is of opinion that Mr. Grant was deceived, and has thereby caused considerable loss of revenue to the State—as much as half a lakh in two pergunnahs; but I beg to differ from this officer in the conclusion he has arrived at. When I left the district, many of these leases were still in force.

7. I do not wish in the least to shirk my own responsibility in the share I took in these proceedings as Collector of the district. While anxious myself to secure to Government its full share of the increased value of the produce of the country from canal irrigation, I at the same time warned my subordinates to be moderate in their assessments,—to avoid exaggerated and imaginary rentals, and to remember that a considerable portion of the increase in value of the produce would be drawn off on the farm of canal water rents, which Government intended to enhance to the full value of the price of the water. All the assessments were submitted to me previous to being avowed; therefore, if Mr. Grant is to be blamed, a greater portion of blame rests with me.

8. On other grounds, too, I had in the course of my experience observed the fatal results of over-assessment, the dreadful misery and despondency caused by fixing the jummas too high. I was determined, if I committed an error, it should be on the side of moderation, not of severity. It is generally believed that Mr. Thornton's settlement was excessively light, and much below two-thirds

of assets, because there have been no coercive processes in realizing Government revenues—as if this were not a source of congratulation, rather than of regret. Nevertheless, it will be found that during the last settlement as much as 30 and 40 per cent. of the land has been transferred to money-lenders and to others by private and compulsory sales. This does not look as if Mr. Thornton's jummas were as low as they are reputed to be. The explanation given of this—that the people have been extravagant in their marriage and private expenditure—cannot account for the large proportion of property that has been, and still is, changing hands. The love of ancestral home is very strongly fixed in the hearts of natives: nothing but dire necessity has compelled them to part with their property.

9. In assessing canal-irrigated estates, it should be remembered that there is a tendency to deteriorate. For the first few years of irrigation the profits are considerable, the country is deluged with water, rice and sugar-cane crops abound in every direction, until a time comes when nature puts a check on further exhaustion, and the soil becomes impoverished for want of a return in manure and for want of rest. High farming will not last either in Moozuffernuggur or Meerut; the time will surely come when the area now under cane-cultivation will have to be contracted. We have examples of this depression in many villages lying along the Eastern Jumna Canal, where, from over-cropping, flushing, damming up the drainage lines by irrigation channels, and the entire absence of sub-soil drainage, field after field of the best lands near the village site has had to be abandoned; for miles the country on the left bank of the Jumna Canal, the surface of the soil is as white as snow, all the impurities of the soil have been driven to the surface. The country in and around Shamlee is known as "rehala," and when this "reh" or impure soda once makes its appearance, not even grass will grow.

10. The climate too has changed very much for the worse: the very worst kind of fevers prevail in the neighbourhood of canals. In many villages, like Bhynswal, Pergunnah Shamlee, population is either at a stand-still, or is retrograding; trees and groves are becoming leafless, and the wells are choked with filthy stagnant water to the brim. The water-mark is two and three feet up the walls of the decaying houses. "All is not gold that glitters." Canals are doubtless of great benefit to the public and to the State—they stave off famine, and should yield revenue; but they have their evils too. The profuse use of water by a lazy and careless population, want of manure to support an exhausted soil, wane of drainage, and submersion of extensive tracts by the damming up of the rajbuhas during rains, are all tending to effect a sure and certain damage, which may be perpetual.

11. When I reported the miserable state of things I witnessed about Shamlee, Bhynswal, Zarpore, and other villages on the banks of the Eastern Jumna Canal—once the finest part of the country—to the Board of Revenue, I was favored with a copy of Mr. Sherer's report on the deteriorated villages lying along the Western Jumna Canal. This report, written previous to the mutiny, showed as deplorable a picture of desolation, where once had been smiling fields, as I think I ever read. Annually hundreds of people are carried off by fevers in the highly-irrigated villages along the Jumna and Ganges Canals. The springs have risen five, six, and eight feet,—so much so, that one year I had to remove a large quantity of grain stored in pits by traders in Moozuffernuggur, water having found its way into the "khattees," or grain reservoirs, and putrified the contents. The same thing occurred about Sirdhana, in the Meerut District; the residents who could afford to do so left the place; and last year in and about Moozuffernuggur for miles more than half the population was laid prostrate with fever.

12. I mention these well-known facts to show that these are causes at work which tend to limit the production of wealth on the otherwise flourishing villages irrigated by canals. An exceptional year of prosperity must not be taken as a guide. Mr. Cadell's rough estimate of Rs. 6 per acre for irrigated and Rs. 3

for unirrigated lands, all round, may be liable to many deductions; revenue cannot be adjusted on the thumb rule—two plus two make four. If zemindars have found it best for their interests to rent their villages for years past at moderate and fair leases, I do not see what business the Settlement Officer has to say these leases are fraudulent, and will be doubled immediately the settlement is sanctioned. A Settlement Officer's duty must make him suspicious, but he should study to be fair to all parties.

13. Again, what authority has Mr. Cadell for saying at paragraph 9—"to look at the assumed rent-rate for irrigated meesun in another way, it is obtained by assuming one sugarcane crop at a very moderate rate in three years, and the remaining two years fallow."

Nobody would think of giving such grounds for a rate; certainly Mr. Charles Grant, Junior, as intelligent an officer as any of the staff now employed in the settlement, would not have given so absurd a reason. Perhaps Mr. Cadell is not aware that the best kind of sugarcane, from the time the soil is first prepared till the time it is cleared of the crop, occupies more than a year; but this is a very different thing from ascribing a low rate to an imaginary two years' fallow. It would be a good thing for the zemindars if they could allow portions of their land to lie fallow occasionally for a year; but their pressing necessities put this out of the range of possibility.

Rs. 5-0-7½ per acre may be a little low for meesun in Khutowlee, but Rs. 8-6 would certainly be too high to charge for meesun all round.

14. I feel sure that there is a great risk of over-estimation of assets in canal-irrigated estates—so much so that if I were a zemindar in India, possessing an estate moderately irrigated from wells, nothing should induce me to join in any scheme having for its object the extension of canal-irrigation to my property. What with enhanced revenue, enhanced canal water-rents* taken out of the pockets of the cultivators, heavy cesses, legal and illegal, and general unhealthiness everywhere near a canal, I should prefer to stick by my wells; for although well-irrigation is much more laborious than irrigation from a canal, the crops are far sweeter and heavier from wells than canals. Much of the cane-juice now obtained from lands irrigated by canals is so watery and insipid as to be half the value of the cane produced from well-irrigation; besides well-irrigation is always within one's control, while the other is not.

15. Instead of looking upon Rs. 3 per kutcha beegah for sugar-cane as a fair average rent-rate, according to Mr. Cadell, I believe Rs. 2-4-0 is nearer the mark; in some places Rs. 2-8, and very rarely Rs. 3,—so rarely as to be exceptional. It will be found that the rent-rate for sugar-cane and cotton (called zubtee) have varied very little since the last settlement by Mr. Thornton. Where the zemindars have benefitted by the canal, is in receiving the same zubtee or cash rents for valuable crops over a greater breadth of area, but the actual proportion paid in rent has been stationary. Similarly, the average rate for mukhee is nearer 8 annas than 12 annas the kutcha beegah.

16. I emphatically deny that the rent-rolls made subsequent to the settlement had any reference to the jummas previously announced. My instructions to Mirza Vicar Aly Beg, Deputy Collector, were to convert the rentals from kind into cash, irrespective of the assessments. My orders were to fix an equivalent in money for the average amount of produce previously enjoyed by zemindars. Mr. Cadell should, I think, have searched for my instructions to the Deputy Collector before making such an assertion. The Commissioner of the Division will bear me out when I say the rent-rolls so adjusted showed a large amount of profits in several villages in the Jansut Tehseel Pergunnahs,—so much so, that Mr. Williams suggested I should revise the jummas in all cases where the revised rent-rolls justified such a course. When the Senior Member of the Board of Revenue, Mr. Muir, visited Moozuffernuggur during the progress of the settlement, the subject of these rent-rolls was discussed, and it was determined that unless the profits left over to the zemindar after payment of revenue and expenses were excessive, not to revise the jummas. A list of these estates will be found among the correspondence.

* The canal water-rents when I left were, I think upwards of three lakhs.

17. At paragraph 11, Mr. Forbes remarks—"Mr. Cadell, in his 21st paragraph, observes that suits for enhancement have been few, *because they were as a rule discouraged. This opinion has been arrived at chiefly from general report*, but also from one notable case, &c." Vague assertions of this kind, founded on general report, should not, in justice to absent officers, be made by Messrs. Forbes and Cadell. I do not know to what particular case Mr. Forbes refers; but this I do know that neither myself nor any of the officers under me discouraged suits for enhancement of rents; nor, indeed, had we been so disposed, could we by any amount of pressure have prevented such suits being preferred: the suggestion is ridiculous. I might with equal justice give credit to a report I heard that the Settlement Officers in Meerut made fancy jummabundees prior to assessment, and compelled cultivators to assent to new rents, in order to suit highly-augmented jummas. It is not usual for public officers to accept mere rumours, and I cannot but feel surprised that an officer of Mr. Forbes' reputation should have done so.

18. It is an easy matter to increase any settlement, however well adjusted, by a lakh or two of rupees; but whether such increase will compensate Government for the general dissatisfaction and despondency that will be caused by keeping zemindars in ignorance of what may be the ultimate demand made on them by Government, is, I venture to suggest, very questionable; already the zemindars look upon the proposed permanent settlement as a sham. It is clogged with so many conditions as to be valueless in their sight. I am fully aware that the Moozuffernuggur settlement is moderate: I always intended it should be so. Believing, as I do, that the best interests of Government are served by fixing the demand at, and not above, a moiety of the assets, I directed the best attention I could to the subject. My motto was, and always will be,—"*jumma nurrum, tehseel gurum.*"

No. 21A, dated Nynee Tal, the 27th June 1868.

From—C. ROBERTSON, Esq., Junior Secy. to Govt., North-Western Provinces,
To—The Offg. Secretary to the Chief Commissioner, Central Provinces.

I am directed to acknowledge the receipt of your memorandum, dated the 17th instant, regarding the assessment of part of the Moozuffernuggur District.

2. I am to convey to you the thanks of the Lieutenant Governor for your memorandum, the contents of which will be duly weighed, and will be of service to the officers engaged in the revision of the settlement.

3. His Honor sees no reason why you should not communicate with others on the subject.

No. 22A, dated Nynee Tal, the 27th June 1868.

From—C. ROBERTSON, Esq., Junior Secy. to Govt., North-Western Provinces,
To—The Secretary to the Board of Revenue.

I am directed to forward, for communication to the officers concerned in the present investigation into the character of the assessments in the Moozuffernugger District, the accompanying copy of a memorandum received from Mr. C. Grant, Officiating Secretary to the Chief Commissioner, Central Provinces, regarding the assessment of part of the district.

2. The general considerations, as well as particular facts and grounds urged by Mr. Grant, will no doubt receive full and careful consideration from Mr. Forbes, in whose caution and judgment in so serious a proceeding the Lieutenant Governor places much reliance.

No. 36, dated Meerut, the 15th July 1869.

From—W. A. FORBES, Esq., Collector and Superintendent of Settlement,

To—The Commissioner of the Meerut Division.

I have the honor to forward, for submission to the Board and Government, a report on the Pergunnah Poor Chupar, Zillah Moozuffernuggur, which, though dated 16th February last, was in reality only received by me on the 6th instant.

It is not my intention to offer any remarks thereon at present: in the space of a month or so, a final report upon the whole tract of country irrigated by the Ganges Canal will be submitted, in which the opinion that that portion of the Moozuffernuggur District needs revision, both as regards assessment and settlement papers, will be maintained.

Dated Camp Charthawal, the 16th February 1869.

From—The Assistant Settlement Officer, Moozuffernuggur,

To—The Superintendent of Settlement, Meerut and Moozuffernuggur.

I have the honor to submit the following remarks on the settlement of Poor Chupar, in the Moozuffernuggur Tehseel.

2. I regret to say that I am unable to recommend this settlement for permanence, as it appears to me that no sufficient weight has been given to the very important point of canal irrigation. I am aware that, in making this assertion, I am, to a certain extent, impugning the judgment of an officer many years my senior, and of much greater and more varied experience in the public service; but in discussing a question like this, of great and lasting importance, the only course left open to me is frankly to state the result of my investigations, and to leave higher authority to decide whether or not there be sufficient grounds for the opinions which I shall now proceed to express as shortly and as clearly as I can.

Classified Statement of area of Poor Chupar at settlement.

Kind of soil.	Irrigated.	Dry.	Total.	Percentage to cultivated area.
Meesan ...	9,903	640	10,543	26
Rosli ...	15,731	10,293	26,024	63
Dakur ...	351	366	717	1¾
Bhoor ...	299	3,520	3,819	9¼
TOTAL ...	26,284	14,819	41,103	

Cutturable waste, 4,886; new fallow, 1,758

Former jumma	...	57,027
Present „	...	59,330
INCREASE	...	2,303

3. The Pergunnah of Poor Chupar is bounded on the north by the Pergunnahs Munglour and Deobund, in Saharunpore; on the south by Pergunnahs Moozuffernuggur and Bhookurheree of this district; to the east, by Pergunnah Gordhunpore; and to the west by the Kalee river. As is remarked by Mr. Martin, paragraph 4 of his report on Poor Chupar, a distinguishing feature of this pergunnah is the capricious course taken by the sandhills; indeed, the extent of *bhoor* is the great agricultural defect of the pergunnah. Thirty years ago this and the want of water must have been the chief characteristics of this tract, but now no description would be complete which did not dwell upon the plentiful irrigation supplied from the high level channels which intersect the whole area, the fine stretches of rice cultivation, the frequent cane fields, the great expanse of irrigated wheat, and, lastly, the strong vigorous Jât and Taga brotherhoods, which hold the better portion of the land, and are steadily improving the character of the cultivation.

4. Mr. Martin writes in his report that "this pergunnah has been generally considered to be more advanced than either Moozuffernuggur or Bhookurheree," but this is hardly a correct view of popular opinion. Poor Chupar, certainly inferior to Moozuffernuggur, is held to have made a more rapid advance than any

other pergunnah in the district, and it is constantly pointed to as the pergunnah in which the change caused by the canal has been most marked.

5. That this is the case has been due not to the superior energy of the people, but simply to the fact that, before the opening of the canal, irrigation was practically unknown. The increase of the irrigated area from 53 acres to about 22,000 (the settlement papers give 26,284) has involved a total change in the agricultural condition of the pergunnah and in the circumstances of the people.

The harm done to the low lands by percolation from the canal, and by the change of the course of the Solani, has been, comparatively speaking, trifling, and cultivation has increased by 3,350 acres since last settlement.

6. In Poor Chupar then it might fairly have been expected that so extraordinary a change in the agricultural condition of the pergunnah would have justified a very considerable increase in the Government demand. That no such increase has been obtained, I attribute partly to forgetfulness of the great change worked by the canal, and partly, perhaps, to a disinclination to base any serious increase upon data which were palpably incorrect.

7. When dealing with the Khutowlee and Jansut Pergunnahs, I purposely avoided any detailed comparison with the former assessment, on account of the difficulty of comparing with any accuracy the irrigation entries of Mr. Thornton's settlement with those of Mr. Grant's papers, in which the classification is based upon principles altogether different from those which were formerly adopted. In Poor Chupar, however, there is no such difficulty.

At last settlement irrigation was so trifling that it was not thought necessary to calculate wet rates.

The application, therefore, of Mr. Thornton's dry rates to the totals of the various soils will show approximately what would be the present assets if canal water had not been brought into a pergunnah in which wells and tanks for purposes of irrigation are almost unknown.

It is, of course, impossible to get clear altogether of the influence of the canal, for to the great impulse given to agriculture by canal irrigation, is due in a great measure the increased labor and attention devoted to the land, and the consequently larger extent of the best kind of soil. The calculation will, however, show approximately what would be the assets of the present soil areas if irrigation were withdrawn; and if there be still a deduction to be made on account of the canal, it is to be remembered, on the other hand, that no increase has been made to the former rates, notwithstanding the rise in prices and the increased competition for the land.

8. The application of Mr. Thornton's dry rates to the *meesan*, *rosli*, *dakar*, and *bhoor* of Mr. Martin's new statements gives the following result for the pergunnah, exclusive of the deteriorated estates (the detailed statement will be found in Appendix I):—

Assets by Mr. Thornton's dry rates.	Double of present *jumma* inclusive of Rs. 500 for *maafee* estates.	Increase to assets caused by the canal, the rise in prices, and the general progress of 20 years.
Rs.	Rs.	Rs.
1,15,616	1,19,300	3,684

It is not, however, possible to give this result, as it stands as an argument against Mr. Martin's settlement, for it must be granted that the soil entries in the No. II statements are unreliable. I speak of the No. II statements as distinct from the *khusrahs*, because an additional error has been made by Mr. Martin in classing second class *rosli* with *rosli* of the first class. Second class *rosli* is, as the instructions to the Moonserim show, a soil between *rosli* and *bhoor* with more

of the latter than of the former. It appears but not very generally in Mr. Thornton's classification, and we are told, paragraph 4, Saharunpore Settlement Report, that "doubtful cases were classed under the inferior denomination." In this pergunnah an exactly opposite principle has at the recent settlement been adopted, nearly all doubtful land and a great deal regarding which there can be no doubt at all have been classed with the superior denomination.

Mr. Martin noticed (page 83, printed report) that the *bhoor* was understated, and suggested that the proportion of this soil could not be less than 14 or 15 per cent. I have, therefore, in the next table, classed the second *rosli* with *bhoor*, and the following is the result:—

Assets by Mr. Thornton's dry rates.	Double of present *jumma*.	Increase to assets caused by the enormous addition to the irrigated area, the rise in prices, and the general progress of 20 years.
Rs. A. P.	Rs. A. P.	Rs. A. P.
1,11,129 13 11	1,19,300 0 0	8,170 2 1

In this calculation I have assumed 8,824 acres to be *bhoor*, and have thus given a very much larger porportion of sand than Mr. Martin demands.

9. The result of these calculations is very startling, and the present *jummas* would seem to assume that, taking for granted that the dry area has remained in every respect as it was 20 years ago, the average increase to the value of that portion which has come under irrigation has only been a little over five annas per acre.

It is useless to say, as has been said of such figures, that settlement is not a mere matter of arithmetic.

We have a settlement made in 1841 before the canal was opened, and when irrigation was almost unknown, and a settlement made in 1863, when more than half of the cultivated area was fairly irrigable (Mr. Martin gives 63 yer cent. irrigated), and we may fairly ask whether the increase to the assets due to the canal can be so trifling as is implied by the present assessment.

10. Before proceeding, however, to the consideration of this question, it may be well that I should attempt to meet some of the most obvious objections to these calculations.

It may be urged, as was done with reference to Khutowlee and Jansut, that Mr. Thornton's assessment pressed heavily upon the people, and that it was more than what it professed to be 65 per cent. of the assets.

Note.—It is clear from vernacular records that Mr. Thornton's assessments were at 65 per cent., not exactly at ⅔ of the assets.

Transfers during the period of Mr. Thornton's settlement amounted to about 16 per cent. of the area, and a large proportion of this is accounted for by severe pressure of the *jumma* in Bheinsurheree and the enormous Mouzah of Baserah, and to the dissensions and to some extent unfortunate speculations of the Jâts of Toglapore who took the lease of some *khadir* estates, the *jumma* of which was exacted long after the swamped hands had become unproductive.

As a rule, however, the pergunnah has been prosperous. The large Taga brotherhoods have held their own, and the only whole estate which has been alienated during the period of settlement was sold at a low figure by a wealthy capitalist to the Kanoongo of the pergunnah just before the period of settlement expired, for reasons, it may be presumed, altogether independent of the incidence of the assessment.

11. Another obvious objection is to the correctness of the soil entries, and especially to the area entered as *meesan*. The entries of this soil I have tested by the only means in my power—a reference to the Putwaree's papers for the two years immediately preceding the assessment of the pergunnah. The result shows very clearly that the manured land has not been entered in excess. It is not much more than double the area under cane, cotton, and the finer rice in a single year, and it is to be remembered that although it cannot be asserted of other crops of cane, cotton and *munji* that they are almost invariably grown upon manured land, it is unquestionable that much *dhan*, *mukkee*, and even *churee* are grown in rotation with cold weather crops upon first class soils.

The proportion of *meesan* to the cultivated area is only about 25 per cent., and to the stated irrigated area less than 40 per cent., both very moderate.

12. The calculations already given would, in my opinion, be sufficient to show the inadequacy of the present assessment. if Mr. Thornton's rates be accepted as reasonable, and if all the soil entries could be depended upon.

To Mr. Thornton's rates objections can hardly now be made, as they formed the basis of those fixed by Mr. Martin; but it must be frankly acknowledged that the soil entries in this pergunnah cannot be accepted as even approximately correct. The *khusrahs* were for the most part written by Putwarees, who appear to have been very fairly accurate; but the rough copies which have in some cases been preserved, show the most disgraceful work on the part of the Ameens and the Moonserim.

Bhoor was recklessly changed into *rosli* and dry into wet, so that the *bhoor* cannot be less than some 6,000 acres under-stated, while not less than the latter area has been wrongly entered wet. The Deputy Collector in charge was unfortunately changed before the work was tested, so that, as far as I can make out, the khusrahs of this pergunnah have remained just as the Moonserim left them.

13. I have given in Appendix III the soil entries of some of the settlement *khusrahs*, and those by amended *khusrahs* made under my supervision. The estates selected were chiefly those in which enhancement suits have been instituted, and regarding which some more reliable information was required, These papers are not what they might be, as I have had no establishment for testing purposes, but they are, I hope, pretty correct, and regarding irrigation I availed myself of the only source of accurate information—the canal records.

14. A comparison of these *khusrahs* shows very clearly the defects which I have mentioned—the over-statement of irrigation, and the under-statement of *bhoor*.

The total irrigated area in the pergunnah is, according to Mr. Martin, 26,284 acres. The average annual irrigation during the last four years is only 14,510, while the greatest area irrigated in two *fussils* is 18,048, the former of these two amounts would give, according to the proportions which I have observed in this and other pergunnahs, about 22,000 acres of land ordinarily irrigated. This in no way contradicts my former estimate; for although irrigation was largely overstated in many villages, the Sheiks who own Poor and neighbouring estates have managed to secure favourable *khusrahs*, and towards the north of the pergunnah too small an area has been entered wet.

15. A great deal of the area wrongly classed as irrigated is *bhoor*. Baserah, indeed, with 1,728 acres wrongly entered "wet", is not a solitary instance; it is an example of the way in which the *khusrahs* were in many cases prepared. No thought appears to have been given to the question whether land entered as wet had ever been irrigated, or was likely to be watered in a short time. Indeed, it is greatly to be regretted that the irrigation entries of this pergunnah were not checked either generally or in detail by information called for from the canal department. Irrigation, and especially canal irrigation, is a matter of no small difficulty to the Settlement Officer, and it is very desirable that such obvious aids as the exact statistics of previous years should not be altogether overlooked.

The gross errors in this respect appear to have proceeded from the mistaken idea that rajbuhas could irrigate an unlimited area, and that water was sure to be taken even at great expense for the most worthless soil.

The former mistake is obvious, and a little consideration will show that the latter conclusion is equally unsound.

16. The giving of canal water to land is, of course, guided by principles exactly similar to those which rule cultivation. Cultivation stops short when it reaches land which will not return the ordinary profits of the laborer, and in the same way canal irrigation is only given to those fields which return a reasonable profit over and above the increased cost of cultivation. In bhoor land the increased production caused by irrigation is very small, too small under ordinary circumstances to repay the water-rate, so that when prices are low, the sandy soil depends wholly on the rains, as the water-rate, while it would add but little to the produce, would swallow up the profits.

In a famine year, however, the case is wholly changed; the value of grain is trebled, and even the straw generally plentiful and cheap, becomes an article of very high value, while the serious item of water-rate remains unchanged. In a famine year, therefore, much bhoor is watered, which does not again come under irrigation, until the next season of scarcity renews the conditions under which it becomes profitable to water bhoor.

17. It is, therefore, most necessary that at settlement hasty generalization should be carefully avoided, and that all the land thus irrigated under extraordinary circumstances should not be treated as identical with the altogether different soils which are regularly irrigated in rotation. Such very occasional irrigation I would not enter in the *khusrah*, but would, where necessary, make special allowance for the possible extension of canal irrigation when fixing the assessment.

Unfortunately, however, the mistakes in this pergunnah have not been limited to the entry of fields irrigated only in the famine year—large tracts of undulating sand, which have never once been watered, have been put down as "wet."

I do not of course mean to say that this bhoor land will never come under canal irrigation. If the present supply of canal water to this pergunnah be continued, the bhoor land will, in the future, be steadily improved, as has been the case in the past, but such improvement will necessarily be slow, as until this class of soil is carefully manured, until, indeed, it ceases to be bhoor, regular irrigation does not pay.

18. With reference to this point, it must be remembered that Poor Chupar was in a different position when the canal opened from that occupied by the pergunnahs to the south. There the canal set free the men and cattle who were at the wells. The great want—water—was supplied, and supplied, too, to cultivators accustomed to its use. Here, on the other hand, there were no wells, and no labor was set free, manure was less plentiful, and what there was was liable to constant seizure by the canal authorities. Population, too, although slowly increasing, is still small in comparison with that of the southern pergunnahs; and so far has the canal been from setting labor free for the more distant lands, that the more valuable crops and the careful cultivation rendered necessary, greatly increased the demand for labor, which was only very gradually met by an increase in the population.

The people of Poor Chupar, therefore, even if they had equalled in industry the inhabitants of the southern tract, were not in a position to make such inroads on the bhoor as were effected elsewhere.

The Jâts and Tagas of Poor, notwithstanding the progress they have made, are still merely working on the edges of the sand waste, while the people of Khutowlee have caused bhoor to disappear from estates in which it once formed a large proportion of the area.

The comparison which I have made (Appendix III.) between the *khusrahs* of the former settlement, and those of the recent one, shows the enormous

proportion of bhoor which was then entered. These areas are, however, only approximate.

In Mr. Thornton's *khusrahs*, no less than nineteen dry soils are enumerated, and in arranging these under four heads, some errors may have been made.

19. With such incorrect data as I have described those of Mr. Martin's settlement to be, it might naturally be expected that the pergunnah would be greatly over-assessed, but fortunately it was saved for this calamity, in some cases by the lowness of the rates, in others by the complete disregard of the rates which had been assumed.

The method of fixing these rates is shortly described in paragraph 7, pages, 84 and 85, of the printed report.

No more detailed report was apparently sent to the Board, so that I am obliged to rely upon the meagre outline given.

20. It is stated that the Settlement Deputy Collector, Nanak Chund, "took the *kunkoots* or appraisments of a dozen or more villages, and obtained some rough *chittas* from the zemindars from which he eliminated (*sic. in orig.*) the following standard rates (summary) :—

Rent-rates per acre.	Irrigated by canal.	Unirrigated.
	4-5	2-6

The wet rate appears to be a most safe and moderate one.

In my calculations I have assumed a slightly higher rate Rs. 5-4 per acre, or annas 14 per kutcha beegah; but I think I am quite safe in this, not only because the slightly higher rate applied to an irrigated area, 4,000 acres less than that of Mr. Martin, but because the rate is in itself moderate, as is shown by the Appendix.

The dry rate is of little use where an ever varying proportion of the land is sand, for which Rs. 2-6 would be ruinously high.

21. It is objected generally to these rates that they are a great deal too high, owing to "implicit reliance having been placed in Mr. Thornton's *chuk*-rates, adding the fourth for the increase of prices."

Now it is to be remarked that the addition of the one-fourth, if it was made, was due to Mr. Martin, and it is difficult to conceive that prices should have risen 25 per cent. in Moozuffernugger, and not have been very similarly affected in Poor. Mr. Martin himself has adhered to Mr. Thornton's circles far more closely than the great change worked by the canal warrants. This last objection, moreover, might be met with the suggestion that the Deputy Collector does not appear to have used any circles at all, but merely to have fixed a rough pergunnah rate. What prices he assumed, or whether he assumed any, or based his rates on prevailing rent-rates, I have no means of knowing.

This wet rate, however, seems to have been accepted as a rough pergunnah one, but was immediately afterwards subjected to a deduction of nearly 25 per cent. for "the water rate of one rupee paid by the zemindar to the canal department." This deduction appears to have been made roughly, as I can find no trace of the calculation which led to it. Where the zemindar pays his share of the water-rate, he pays in proportion to the share of the produce which he receives from the cultivator, and this share may or may not be one rupee. It is almost impossible that it should average so much, for, with the exception of rice, all the crops which are charged the higher water rates pay a fixed crop rate in money, and with the irrigation of such crop, the zemindar has nothing to do.

I have not made any attempt to work out the necessary calculation, because, in the first place, I do not know how the Deputy Collector worked out his rates from estimated produce or from prevailing money rents; and secondly, because even if he based his rates on estimates of produce (in which case alone

any such deduction could possibly be required), there are only comparatively few estates in which the zemindar pays any such rate, and in these estates he only pays a share of the water rate due for crops, the rent of which is paid in kind, and not by a crop rate as in the case of cane, cotton, churee, &c.

The usage is confined to the estates in the east of the pergunnah, and is by no means universal even in them. The rates, moreover, in such estates as Toglakpore, Kamehra, Khai Khera and Godhna (Appendix III.), clearly show that the assumed rent-rate could not be summarily set aside on this ground alone. Besides, even granting the rupee one to be so far correct, the custom is known only in the inferior half of the pergunnah, and in that half is not universal, and in no case applies to a large proportion of the crops for which water is most constantly taken.

22. But neither to this new rate of Rs. 3-5-0 wet, nor to any other rate was great attention paid. Rates, chiefly those of Mr. Thornton, modified for the irrigated area, were applied, and the results are given in the No. III. statements, but they were seldom or never followed, and the pergunnah *jumma* of Rs. 59,250, excluding the swamped estates, is more than Rs. 13,000 less than that shown by the deduced revenue rates.

As a rule, notwithstanding the enormous change which had taken place, the old *jummas* were simply retained. In only twelve estates out of the fifty-three with which we have at present to do was the assessment more than nominally increased, and in only one case does the increase greatly exceed 10 per sent.

Summary rate indeed of Mr. Martin gives a rent-rate of less than annas nine per kutcha beegah wet, or less than one anna in excess of what Mr. Thornton's average dry rate for the same soil areas would have come to.

No this almost inappreciable difference is wholly contrary, not only to all experience, but to what the rent-rates fixed under Mr. Martin's supervision points. In most villages the wet rate is the nearly double the dry rate; and allowing for the fact that the average dry land now is inferior to the average dry land thirty years ago, when all the manure was given to dry land, the addition of 50 per cent. for irrigation to Mr. Thornton's dry rate cannot be looked upon as excessive. This would give a pergunnah wet rate of about annas 12, almost identical with that fixed by Deputy Collector Nanak Chund.

23. That little or no attention was paid to irrigation is, however, still more clearly shown by the remarks in the No. III statements and by the comments of the Commissioner.

Indeed the vexed question whether assessment was to be made on actual assets does not appear to have been settled when the *jummas* of this and the neighbouring pergunnahs were fixed. Across the statement compiled by Mr. Martin, showing a clear gain to the revenue Rs. 11,089 due to the canal, the Commissioner writes—"This cannot be admitted, a reference to the Nos. II. and III. statements show that, in many cases, the demand is independent of the canal." Many of the comments on these statements show this more clearly in such remarks that "further enhancement of the demand must be held to be due to irrigation from the canal, and the capability of the estate to pay more should be elicited in the shape of water-rate."

This view is shown still more clearly in the remark on the No. II. statement of village Shahabudinpore in Moozuffernuggur—"except that, in my opinion, the assessment should not be enhanced with reference to canal irrigation, this (*jumma*) would be too low."

It cannot, therefore, be stated, as has been done, that the details of the settlement met with the unqualified approval of the Commissioner, whose remarks regarding this and neighbouring pergunnahs show that very grave doubts were entertained regarding the sufficiency of the assessment.

24. As an example, and it is only one of many, of the the litile value that was put upon canal irrigation, I would call attention to the village of Bhaisani. The change in the condition of this estate may be shortly shown:—

	Cultivated		Fallow.	Total Malgoozaree area.	Jumma.
	Wet.	Dry.			
Former settlement	0	412		661	808
Present „	585	0	60	645	800

Irrigation is, I think, a little over-stated, but the average of the last five years has been 335 acres, and the maximum 461, the ordinarily irrigated area can hardly be less than 450 acres. So that the circumstances of the estate have been entirely changed. The remark made by Mr. Martin is, that the land has been much cut up by rajbuhas. The lands of the village are, it is true, traversed by two rajbuhas, which intersect just below the village. Inconvenience is thus reduced to a minimum, the cultivator crosses one of the two bridges, and has a clear road to his fields. Yet this trifling inconvenience, and the few acres (23) taken up for the canal works, are held to be a set-off to any improvement caused by the supply of water for the whole area whenever, as, in a year like this, the people find it convenient to irrigate largely. Mr. Thornton's old *dry* rates applied to the present area give a jumma of Rs. 938.

Bhaisani is by no means a solitary example, although it is perhaps an extreme case. As the Commissioner remarked, the No. III. statements show that estates were assessed in many instances altogether irrespective of canal assets, and the following additional instances will show how little weight was given to the increase of irrigation.

In Bhojahera, an increase of cultivation from 912 acres to 1,116, and of irrigation to the extent of 366 acres has been met by an increase to the jumma of Rs. 67, bringing it up to Rs. 900. At Mr. Thornton's *dry* rates on cultivation, it would have been Rs. 1,460-14-6.

In Barlah, now one of the finest estates in the district, rajbuhas and the planting of orchards have reduced the cultivated area by 20 acres, but now instead of the whole estate being dry, 1,872 acres out of 1,924 are irrigated from the canal. The assessment has been raised Rs. 265 to Rs. 4,500. Mr. Thornton's dry rates give an assessment of Rs. 3,064.

In Poor cultivation has increased 500 acres. Irrigation nominally 700, in reality over 1,000, yet the assessment has fallen from Rs. 2,112 to Rs. 2,000. At Mr. Thornton's *dry* rates it would be Rs. 2,362.

In Tikowla, instead of 247 acres dry, there were at the recent settlement 229 wet and 6 dry. The jumma was raised from Rs. 364 to Rs. 400. At Mr. Thornton's dry rates, the assessment would be Rs. 398.

In Chupar cultivation has only slightly increased, but the irrigated area, formerly only nominal, was at settlement 1,775 acres. The increase to the jumma was only Rs. 783 over the old assessment on the dry area of 3,417. Mr. Thornton's rates would give a jumma of Rs. 3,464, and there were 330 acres fallow. The present assessment is Rs. 4,200.

In Khoja Nagla 396 acres out of 443 are irrigated by the canal; this is met by an increase to the jumma of one-seventh. The present jumma is Rs. 700. Mr. Thornton's dry rates would give one of Rs. 659-15-6.

In Dhumat the total change of the circumstances of the village, caused by the irrigation of 427 acres out of 430, is met by an increase upon the old jumma Rs. 487, of Rs. 13. Mr. Thornton's dry rates would give an assessment of Rs. 581-13-6.

In Doheli 295 acres, formerly dry, are now all wet. The jumma has increased from Rs. 288 to 300. Mr. Thornton's dry rates would give a jumma of Rs. 423-15-9.

In Toglakpore the irrigation of 681 acres is met by a rise on the jumma from Rs. 1,329 to Rs. 1,400. The assessment, according to Mr. Thornton's dry rates, would be Rs. 1,233-11-6, and there are 442 acres fallow, the greater portion, however, very poor.

In Kasimpore the irrigation of 527 acres out of 863, and an increase to the cultivation of acres 235, are added only 38 Rs. to the old jumma of Rs. 762. At Mr. Thornton's dry rates, the jumma would be Rs. 1,140.

In Kutabpore the irrigation of 1,305 acres out of 1,371 has had the effect of raising the jumma Rs. 200, from Rs. 2,200 to 2,400. Mr. Thornton's dry rates would give a jumma of Rs. 2,221-7-7.

The irrigation of 1,295 acres in Khai Kheree is met by an increase in the jumma of Rs. 272, making an assessment of Rs. 3,250. Mr. Thornton's dry rates give a jumma of Rs. 3,732, and there are 351 acres inferior fallow.

In Kailanpore, Jalalpore, the irrigation of 427 acres out of the present cultivation of 437 was looked upon as insufficient to make up for the reduction to half assets and the loss of 70 acres taken up for the canal, and the jumma has slightly fallen.

Many more such instances might be given, all tending to show that very little attention was paid to the all-important point of irrigation; and as there are now only four estates in the khalsa upland which do not receive a fair share of irrigation, and as the reduction in the assessment of these four estates amounts to only Rs. 198, it cannot be said that the increase in the assets of the improved estates was met by the reduction rendered necessary in the poor ones.

25. The rent-rates given in Appendix IV. show pretty clearly that the irrigated rate which I have roughly assumed as suitable to the pergunnahs as a whole, is not excessive; and although these rates have been applied to but a small portion of the total area of the pergunnah, they fairly represent the value of the land, and it is impossible to look for numerous rates fixed by private agreement in a tract, three-fourths of the land in which are held either by cultivating proprietors by the tenants with rights of occupancy, whose rates, when paid in money, have, as a rule, been fixed with the sole object of making the assessment literally a half asset one.

For the purposes of rough calculation, I have applied to the dry meesan, rosli and dakar, which I have left the old dry rate of the pergunnah annas 8—very nearly what Mr. Thornton's rates applied to the 1,000 acres meesan and dakar and the 8,000 acres rosli would give. Mr. Thornton's dry bhoor rate I have applied to all 2nd class rosli, wet or dry, to all bhoor of Mr. Martin's statements, and to the additional soil, which in order to be on the safe side I have thought it well to class with the inferior land. It may be as well to remark here that Mr. Thornton's 2nd class bhoor was very limited in quantity, and as I have classed much inferior rosli with bhoor, the ordinary bhoor rate can hardly be too high.

26. The result is—

22,000	Acres	@	5—4=	1,15,500
9,000	,,	,,	3=	27,000
10,403	,,	,,	1-8-4=	15,810
				2)1,58,310
				79,155

The increase to the assets here assumed is very large, being nearly 50,000 over what Mr. Thornton's dry rates applied to the modified areas would bring.

This is, however, by no means exorbitant when we consider the addition of 22,000 acres to the irrigated area, the rise in prices, and the progress of 20 years.

27. I should have been glad to compare the result given by Mr. Thornton's rates of appraisement, which might be expected to give a low but tolerably close estimate of the value of the produce of the pergunnah. The mistakes in the khusrahs, however, would affect to a considerable extent the total given by Mr. Martin, 1,42,000; but, on the other hand, if the method of application of these rates may be guessed at by the records left, there is every reason to believe that very scant attention was paid to the most valuable crop of the pergunnah. In the produce table given at page 16, printed report, the dhan and moonji columns for poor Chupar are curiously enough left blank, while a portion equivalent to only about 700 acres is entered under shalee.

Throughout the report there is no further mention of rice, and this although rice *is the* crop of the pergunnah. In Khutowlee cane is supreme, and rice, although no doubt important, holds at present a subordinate position; in Moozuffernuggur cane has a rival in rice, and in Poor, moonji is *the* crop; people still talk of cane and cotton land, but the rice crop rises above both alike in the extent of its cultivation and in the value of its produce. To assess Poor Chupar, then, without even mentioning this crop, would be as reasonable as to settle Khutowlee without reference to sugarcane, which is the staple of that pergunnah. Rice and especially moonji has made great advances since the settlement, but although not what it now is, the rice crop was a most important one, and when the settlement was finished and concealment ceased, the area under rice cultivation rapidly increased. If, then, the estimated return by Mr. Thornton's rates of appraisement was unduly high owing to the mistaken soil entries, it was also unduly lowered owing to the understatement of the most important crop.

28. To glance for a moment at another estimate, the out-turn given according to Mr. Martin by circle rates framed on those of Mr. Thornton, Rs. 1,73,000, is very much in excess of my estimate. This is no doubt partially due to the over-statement of irrigation and the small recorded extent of bhoor, but it is in a great measure owing to the "fourth added for the rise in prices." This fourth appears to be based upon Mr Martin's table of prices, page 18, printed report. I have already shown the defects of this calculation when discussing the Khutowlee and Jansut assessments; but I have thought it well to give here in Appendix V. a view of the real bearing of this question as far as I have been able to ascertain it.

I have taken the prices of Jalalabad, the chief grain mart of the district, which was the only place from which I could procure sufficiently accurate and extended information.

I have avoided more than reference to Mr. Thornton's averages, because they were taken from statements procured from an unknown number of thanahs, and it is well to avoid unnecessary uncertainties. It will be seen from this statement that wheat had risen in price about 6 per cent., cotton 15 per cent., and goor 10 per cent.,—proportions more in accordance with popular belief than the view of Mr. Martin, or the discoveries of Mr. Colvin and Mr. Grant.

But Mr. Martin evidently put but little faith in his table of prices. The additional one-fourth was promptly dropped in Poor Chupar, was utterly disregarded in Bugra, and does not appear to have affected the assessment of Moozuffernuggur.

29. In conclusion, I would make one or two remarks upon the comparison which is inevitable between the assets assumed by Mr. Thornton at last settlement and those roughly estimated by me.

According to Mr. Thornton's assessment, the assets of the pergunnah were	Rs.	86,835
To this must be added for 3,749 acres increased cultivation at, say, Rs. 2	,,	7,496
TOTAL	Rs.	94,331

so that the assumed increase to the assets has been over Rs. 60,000. To those who are not accustomed to the sudden change caused by canal irrigation, this assumed increase may appear to be preposterous, but the estimated increase of Rs. 3 per acre on the value of the land which has come under irrigation is by no means excessive.

The only pergunnah on the Jumna Canal in which anything approaching to the change in Poor Chupar has taken place is Kandla. The increase to the cultivated area appears to have been 9,000, which, at Rs. 3 per acre, would increase the assets by Rs. 27,000; whereas Mr. Colvin's deduced revenue rates give an out-turn exceeding the former one by a little over Rs. 1,00,000, and this in a pergunnah less dependent than Poor upon the canal, and one in which irrigation has only been doubled; whereas in Poor the opening of the canal has effected a radical change in the circumstances of the pergunnah.

In Kandla an increase of 15,000 acres to the irrigated area has then been met by an addition of Rs. 73,000 to the estimated assets; in Poor an increase of 22,000 acres by a rise of Rs. 66,000.

It is true that Mr. Colvin did not, for special reasons, assess up to the deduced revenue rates; but this was owing partly to the very great consideration shown intentionally to ex-maafeedars, and unintentionally probably to mahajuns. Even the assets assumed by the actual jumma allow Rs. 40,000 to the 15,000 acres of increased irrigation. There are, of course, other causes of progress, but they exist in both pergunnahs to a considerably greater degree however in Poor Chupar than in Kandla; for, as has been already remarked, the former pergunnah has progressed in a far more striking manner than any, other pergunnah in the district.

I have not brought in this comparison with Kandla in order to justify my rough estimate of the assets of Poor Chupar, but merely to show that there is nothing *primâ facie* preposterous in the progress which I have assumed.

As far as I can at present see, that estimate is a moderate one; but until the soil entries are at least approximately correct, it is useless to speculate with any pretence to accuracy as to what the jumma of this pergunnah might fairly be.

The areas which I have assumed are confessedly only rough guesses; but the alterations which I have made have been in favour of the present assessment, and against the view to which these investigations have given rise.

That the pergunnah has improved enormously since 1841, there can be little question; that sufficient attention has not been paid to the 22,000 acres of irrigation due to the canal and to the effect of 20 years of almost unbroken prosperity which this pergunnah had enjoyed has, I trust, been clearly shown. Anything better than a rough guess at the assets, and at the amount of a moderate and fair assessment, must be deferred, as I have at present no data sufficiently reliable to serve as the basis of an accurate estimate, and have neither the means of collecting the information, nor the authority to undertake the task.

APPENDIX No. I.

Showing the application of Mr. Thornton's *rent-rates for the different* dry *soils to the soil areas of* Mr. Martin's *settlement.*

Name of Chuck.	Land in Acres.					Rent per Acre.					Jummabundee.					Present Jumma.
	Meesun.	Rosli, 1st and 2nd Class.	Dakur.	Bhoor.	Total.	Meesun.	Rosli.	Dakur.	Bhoor.	Total.	Meesun.	Rosli, 1st and 2nd Class.	Dakur.	Bhoor.	Total.	
						Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs.
Chuk Poor ...	2,828	9,774	131	2,153	14,886	4 10 0	2 5 0	2 7 0			13,079 8 0	22,602 6 0	319 5 0	3,274 5 8	39,275 8 8	17,510
„ Chupar ...	4,823	9,605	101	1,053	15,582	4 6 9	2 6 6	2 11 0			21,326 11 3	33,112 0 6	271 7 0	1,217 8 6	45,927 11 3	26,460
„ Burumpore ...	1,032	3,641	71	477	5,221	3 13 8	2 7 9	2 13 5			3,977 8 0	9,045 9 9	201 8 7	526 11 0	13,751 5 4	5,750
„ Sikundurpore ...	280	450	2	30	762	2 11 1	2 3 11	2 12 7			753 15 4	1,010 2 6	5 9 2	38 7 0	1,808 2 0	980
„ Ghoor	155	557	46	51	809	4 6 9	2 6 5	2 3 0			685 6 3	1,337 6 1	100 10 0	79 11 0	2,203 1 4	1,300
„ Mozuffernuggur ...	738	1,438	...	43	2,219	4 6 5	2 4 4	2 11 0			3,247 15 6	3,265 7 4	...	63 6 1	6,576 12 11	3,150
Mouzah Burla, Chuk Chupar	708	1,106	98	12	1,924	4 6 9	2 6 6				3,130 11 0	2,661 5 0	263 6 0	18 7 0	6,073 13 0	4,500
Total ...	10,564	26,571	449	3,819	41,403						46,201 11 4	63,034 5 2	1,161 13 9	5,218 8 3	1,15,616 6 6	59,560

APPENDIX No. II.

Showing the application of Mr. Thornton's *rent-rates for the different* dry *soils to the soil areas of* Mr. Martin's *settlement, with this difference that* 2*nd Rosli has been classed with Bhoor.*

Name of Chuck.	Land in Acres.					Rent per Acre.					Jummabundee.					Rent Jumma.
	Meesun.	Rosli, 1st Class.	Dakur.	Rosli, 2nd Class and Bhoor.	Total.	Meesun.	Rosli.	Dakur.	Bhoor.	Total.	Meesun.	Rosli.	Dakur.	Bhoor.	Total.	
						Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs.
Chuk Poor ...	2,828	7,414	131	4,513	14,886	4 10 0	2 5 0	2 7 0			13,079 8 0	17,144 14 0	319 5 0		37,407 3 4	17,510
„ Chupar ...	4,823	8,136	101	2,522	15,582	4 6 9	2 6 6	2 11 0			21,326 11 3	19,577 4 0	271 7 0		44,649 15 8	26,460
„ Burumpore ...	1,032	2,993	71	1,125	5,221	3 13 8	2 7 9	2 13 5			3,977 8 0	7,435 11 9	201 8 7		12,856 15 4	5,750
Sikundurpore ...	280	258	2	122	762	2 11 1	2 3 11	2 12 7			753 15 4	803 10 2	5 9 2		1,719 7 8	980
Ghoor	155	411	46	197	809	4 6 9	2 6 5	2 3 0			685 6 3	986 13 3	100 10 0		2,080 10 6	1,300
„ Mozuffernuggur ...	738	1,202	...	279	2,219	4 6 5	2 4 4	...			3,247 15 6	2,729 8 8	...		6,388 1 11	3,150
Mouzah Burla, Chuk Chupar	708	1,052	98	66	1,924	4 6 9	2 6 6	2 11 0			3,130 11 0	2,531 6 0	263 6 0		6,026 13 6	4,500
Total ...	10,564	21,566	449	8,824	41,103	...	...	...			46,201 11 4	51,209 3 10	1,161 13 9	12,557 1 0	1,11,129 13 11	59,650

APPENDIX IIIA.

Statement showing soil areas in acres of various estates in the Poor Chupar Pergunnah according to the Khusrahs of MR. MARTIN'S *settlement.*

Number.	Name of Village.	Total area.	Barren.	Waste.	New fallow.	Irrigated.				Not irrigated.				Total cultivated area.
						Meesun, Rosli, and Dakur.	Rosli, 2nd Class.	Bhoor.	Total.	Meesun, Rosli, and Dakur.	Rosli, 2nd Class.	Bhoor.	Total.	
1	Bhainsanee Muhmoodpore	689	104	54	6	...	70	3	73	512	...	...	512	585
2	Bhainsurheree	740	67	25	19	...	78	26	104	335	58	167	560	664
3	Busera Hosainpore	6,641	916	386	285	...	475	439	914	3,132	697	136	3,965	4,879
4	Tejulhera	1,683	287	136	104	...	2	3	5	952	3	143	1,098	1,103
5	Chupar	2,419	186	183	147	...	37	1,775	1,812	1,729	55	289	2,073	3,885
6	Khoja Nugla	489	46	18	2	...	...	396	396	206	...	47	253	649
7	Raepore Jhojha	340	24	22	4	...	4	222	226	209	24	15	248	474
8	Rutta Nugla	606	48	2	7	...	...	55	55	558	...	94	652	707
9	Simbhalkee	914	66	14	6	...	...	558	558	271	...	...	271	829
10	Kasimpore	922	59	54	28	...	26	237	263	517	175	611	1,303	1,566
11	Kootubpore	1,175	105	45	25	...	9	527	536	1,270	...	336	1,606	2,142
12	Khooda	1,095	154	46	13	...	26	1,305	1,331	496	2	66	564	1,895
13	Koulaheree	475	52	11	17	...	9	30	39	257	18	260	535	574
14	Mandia	816	48	71	94	...	...	1	1	198	...	335	533	534
15	Mihraepore	522	42	5	8	...	...	...	...	437	...	358	795	795
	Account Settlement Khusrahs	20,460	2,201	1,072	765	...	736	130	866	12,020	1,137	1,345	14,502	15,368
	Revised Khusrahs	20,143	2,037	624	1,004	...	1,028	211	1,239	8,534	2,682	3,573	14,789	16,028

Wet Rosli, &c. over-stated by 3,186.

APPENDIX IIIB.

Statement showing soil areas in acres of various estates in the Poor Chupar Pergunnah according to amended Khusrahs recently prepared.

Number.	Name of Village.	Total area.	Barren.	Waste.	New fallow.	Irrigated.				Not irrigated.				Total cultivated area.
						Meesun, Rosli, and Dakur.	Rosli, 2nd Class.	Bhoor.	Total.	Meesun, Rosli and Dakur.	Rosli, 2nd Class.	Bhoor.	Total.	
1	Bhainsanee Muhmoodpore	653	68	57	39	...	6	553	559	382	2	30	414	585
2	Bhainsurheree	743	70	22	19	...	22	323	345	256	83	249	588	673
3	Busera Hosainpore	6,494	802	169	167	18	52	2,179	2,249	1,777	655	1,319	3,751	5,692
4	Tejulhera	1,713	270	35	145	...	36	1,064	1,100	836	89	258	1,183	1,473
5	Chupar	2,481	186	163	146	...	...	1,604	1,604	1,572	62	540	2,174	2,295
6	Khoja Nugla	488	45	20	1	...	...	295	295	259	90	58	407	443
7	Raepore Jhojha	344	22	18	3	...	...	201	201	193	68	22	283	322
8	Rutta Nugla	612	47	2	1	...	22	496	518	419	31	16	466	565
9	Simbhalkee	821	64	19	94	...	...	61	61	59	3	158	220	757
10	Kasimpore	959	59	43	2	...	25	330	355	329	280	696	1,305	1,660
11	Kootubpore	1,485	111	51	9	...	2	1,250	1,252	1,205	99	61	1,365	2,617
12	Khooda	1,489	154	11	9	...	1	826	827	688	410	73	1,171	1,998
13	Koulaheree	634	49	8	60	...	40	64	104	35	14	272	321	425
14	Mandia	677	50	61	339	...	5	40	45	222	196	171	589	634
15	Mihraepore	520	40	5	10	...	33	222	255	292	161	299	752	1,007
	Total	20,143	2,037	624	1,004	...	1,028	9,773	10,801	8,534	2,078	4,573	15,185	18,106

APPENDIX IV.

Statement showing rent-rates fixed by private agreement in Pergunnah Poor Chupar.

Number.	Name of Village.	By Private Agreement. All round.	Wet.	Dry.	Bhoor.	Remarks.
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
1	Ahmedpore	...	...	...	0 3 0	Whole estate uninhabited and at a distance from any village.
2	Behloulpore, uninhabited...	...	0 13 0	0 8 0	0 3 0	94 acres, 32 wet, 11 dry, 51 bhoor.
3	Bhummhunwalla ...	...	...	...	...	Swamped estate.
4	Buhesanee Muhmoodpore ..	0 10 6	...	...	...	178 acres.
5	Bhynsurheree ...					
6	Bhoojahairee ...	...	0 14 0	0 6 0	...	24 acres wet and 25 dry—much 2nd rosli and bhoor.
7	Bhumbhaoree ...	...	...	...	...	All khoodkasht.
8	Boocha (Goojars) ...	...	...	...	...	No money rents fixed by private agreement.
9	Burla ...	1 2 3 1 0 0 0 14 0	1 2 3 1 0 0	...	...	For about 294 acres nearly all irrigated. The rest of the area is held khoodkasht.
10	Bhoorabairee ...	0 12 10 0 11 8 0 10 10	0 14 0	0 7 0	0 4 0	The whole estate 280 acres, highest rate fixed in 1272 Fuslee.
11	Busserah	...	1 6 0 1 2 0 1 0 6 1 0 0 0 13 0 0 11 6	...	...	Averaging annas 14 for 330 acres, rest khoodkasht.
12	Puraee	...	...	...	...	Crop and kind rates.
13	Phulouda, 5 biswa ...	0 11 0	...	...	...	77 acres cannot be distributed, as the entries are so glaringly erroneous.
14	Ditto, 15 do. ...	1 0 0 0 10 0 0 9 0 0 8 6 0 8 0	...	...	...	217 acres cannot be distributed, as the soil entries are so glaringly wrong.
15	Putthairee	...	...	...	...	No cash rents.
16	Kusbah Poor ...	1 0 0 0 14 0 0 12 0 0 10 0 0 9 0 0 8 0	1 2 0	0 9 0	0 4 0	The Re. 1 rate is for 281 acres. The distributed wet and dry rates for 444, but irrigation has increased, so that Re. 1 and 8 annas will be more correct. The annas 4 rate is levied for 235 acres bhoor.
17	Tajulhaira	1 0 0 0 14 0 0 12 0 0 10 0	0 12 0	...	0 3 0	The lowest rates are very old ones—the irrigation of this estate is greatly over-stated, and the bhoor is understated, so that the distributed rates are lower than they ought to be; they are for about 300 acres.
18	Tikoula	...	...	...	...	No money rents.
19	Tajpoor	0 14 0 0 10 0 0 8 0 0 7 0 0 6 0	0 11 0	...	0 3 0	80 acres. Irrigation is over-stated, so that the rates are lower than they ought to be.
20	Jamalpoor	...	...	...	...	Crop and kind rates.
21	Jubburpoor	...	...	...	...	Ditto.
22	Chuppra	...	0 14 0	...	...	5 acres rest crop and kind rates.
23	Chupar Wulleepoor ...	1 4 0 1 0 0	1 3 0	0 10 0	...	19 acres wet, 2 dry, ordinary land; the rest is held by hereditary cultivators, whose rents were enhanced last year to Re. 1-1, and 15 annas wet, annas 9 and annas 8 dry, and annas 4 bhoor.
24	Khoja Nugla { 0 8 6, 0 7 0, 0 5 6 }	1 1 0 1 0 0 0 13 0 0 12 6 0 12 0 0 11 0 0 9 0	0 10 0	...	...	84 acres; nearly the whole area of this estate is entered wet, but the corrected khusrah shows one-third to be dry (chiefly bhoor), annas 13 wet and annas 4 bhoor are about the distributed rates.
25	Dhumat Bangur, Goojurs	0 9 0	...	...	...	All the land is entered wet, but much is dry. The cultivators are Goojurs of the same caste as the landlords.
26	Dohelee	0 8 0	...	...	...	About 80 acres; all entered wet, but much is dry and sandy.
27	Raepoor Jhojha ...	...	...	...	...	No money rents fixed by private agreement.
28	Rutta Nugla... ...	0 11 0	...	...	...	110 acres; account settlement khusrah, the whole area is irrigated, and there is no bhoor, account amended khusrah one-fourth is dry, and good deal of this sand, so that annas 13 and annas 6 would be about the distributed rates.
29	Simbalkee, Goojurs ...	...	0 12 0	0 6 0	...	The dry rate is for rosli; 2nd rosli and bhoor 130 acres.
30	Simurthee, Goojurs ...	...	0 11 6	0 5 0	...	The dry rate is for rosli, 2nd rosli, and bhoor. Whole estate 360 acres.

APPENDIX IV,—*continued.*

Statement showing rent-rates fixed by private agreement in Pergunnah Poor Chupar.

Number.	Name of Village.	By Private Agreement. All round.	Wet.	Dry.	Bhoor.	Remarks.
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
31	Sulaimpoor	0 8 0	...	...	...	18 acres.
32	Sooahairee	0 5 4	0 12 0	0 5 0	...	The dry rate is for rosli, chiefly 2nd class, and bhoor. About 70 acres.
33	Shahjehanpoor ...	0 4 3	...	...	...	175 acres; distribution is impossible, nearly altogether bhoor.
34	Sherpoor	...	...	...	...	Swamped estate.
35	Soohailee	...	...	...	...	Ditto.
36	Shukurpoor	...	...	...	...	The jumma is Rs. 250; jummabundee was made exactly 500. Shikamis pay annas 12.
37	Shumushpoor, Goojurs ...	...	...	...	...	Swamped estate.
38	Toghlukpoor ...	1 5 6 1 4 0 1 1 3 1 0 0 0 14 6 0 14 0 0 13 6 and down to 0 8 0	0 12 0	0 8 0	...	For 168 acres the lower rates were fixed before the opening of the canal, the average recent wet rate is about Re. 1. The rest is khoodkasht and batai
39	Abdoolpoor ..	...	0 12 6	...	0 4 6	120 acres wet, 520 acres dry, almost wholly sand.
40	Kasimpoor	...	...	...		No rates fixed by mutual agreement.
41	Kootubpoor	...	0 10 0	...	0 4 0	For 560 acres wet, but the distributed rates are wholly untrustworthy, as irrigation has been greatly over-stated.
42	Kalleywalla	...	...	...	...	Swamped estate.
43	Kailunpoor Jelalpoor (uninhabited) chiefly Goojurs cultivate	1 0 0 0 14 0 0 12 0 0 10 0	0 12 0	...	...	Over 50 acres, the rest is khoodkasht; or the old dry rate of annas 8 has still been retained for the Goojurs, relatives of the proprietors.
44	Khaiee Khairee ...	1 0 0 0 13 3 0 12 0 0 10 0 0 8 0	0 13 0	...	0 4 0	For 40 acres. For really irrigated land, the usual rate is Re. 1, the rest khoodkasht.
45	Khooddah	...	1 0 0	...	...	57 acres, the rest khoodkasht, or held by hereditary cultivators.
46	Khinduria, Goojurs ...	...	...	...	...	No money rents fixed by private agreement. Those of hereditary cultivators recently enhanced to annas 14 wet and annas 8 dry.
47	Kowlahairee... ...	...	...	...	...	Nothing can be made of this khusrah. No bhoor was entered at settlement. There are certainly not less than 350 acres bhoor and 2nd rosli out of the 600 acres.
48	Kumhaira	1 2 9 0 12 0 0 10 9 0 10 0 0 9 0	0 12 0	0 8 0	...	80 acres.
49	Ghomaotee	...	0 12 0	...	...	90 acres.
50	Godhna Godhnee, Goojurs	...	0 13 0	0 5 6	...	278 acres by private agreement, the 180 dry are chiefly 2nd rosli and bhoor.
51	Lukhnowtee	0 10 0 0 9 0	...	...	...	For wet land paid by a relation of the zemindar for about 22 acres.
52	Mandla, Goojurs ...	1 0 0 0 15 0 0 14 0 0 11 0 0 10 0	0 13 0	0 8 6	0 3 0	Whole estate 800 acres.
53	Mandunwalla					
54	Muherainpoor	...	...	...	...	Swamped estate.
		...	...	...	...	24 acres at Rs. 1-2, and annas 14 per cent., the best land is held by tenants with rights of occupancy.
55	Mirzapoor Shajehanpoor...	0 3 2	...	...		14 acres bhoor, rest khoodkasht and at kind rates.
56	Nohpoor	...	...	...	0 4 6	For bhoor the whole estate.
57	Noornuggur, Goojurs ..	...	...	...		Acres 41 are let for Rs. 81. This is chiefly uneven rosli of the 2nd class, rest khoodkasht.
58	Nugla Mihurdad, Goojurs	0 7 0	...	...	...	37 acres.
59	Nussiroollapoor ...	...	...	...	...	Little or no cultivation, what there is, is khoodkasht.
60	Hurraitee	0 8 0 1 9 0	...	...	...	86 acres. Cannot be distributed owing to the great errros in the soil areas.
61	Chandan, Goojurs ...	0 8 0	...	0 8 0	...	Some 8 acres, rest khoodkasht.

In most cases, the wet rate is lower than it should be, as the irrigated area has generally been over-stated. The only exception to this is Poor the Rent-rate would give according to the Khusrah rates of Re. 1-8 wet and annas 10 dry. The Sheikhs of Poor are the only people who managed to get the Khusrah written in their favour.

APPENDIX V.

In the accompanying statement, the average harvest prices of *wheat* during the 20 years which followed Mr. Thornton's settlement is contrasted with that of the equal period which preceded it:—

I.—1822	...	...	0 34	1842	...	...	... 0 25
1823	...	...	1 0	1843	...	...	... 1 0
1824	...	...	1 7	1844	...	...	... 1 0
1825	...	...	1 5	1845	...	...	... 0 36
1826	...	...	0 30	1846	...	...	... 0 24
1827	...	...	0 35	1847	...	...	... 0 31
1828	...	...	1 6	1848	...	...	... 1 0
1829	...	...	1 4	1849	...	...	... 0 35
1830	...	...	1 6	1850	...	...	... 1 0
1831	...	...	1 0	1851	...	...	... 1 9
1832	...	...	1 10	1852	...	...	... 0 25
1833	...	...	1 0	1853	...	...	... 0 35
1834	...	...	0 30	1854	...	...	... 0 35
1835	...	...	1 0	1855	...	...	... 1 7
1836	...	...	1 10	1856	...	...	... 1 2
1837	...	...	0 35	1857	...	...	... 1 0
1838	...	...	0 20	1858	...	...	... 0 38
1839	...	...	0 20	1859	...	...	... 0 35
1840	...	...	0 20	1860	...	...	... 0 24
1841	...	...	0 24	1861	...	...	... 0 14
			18· 16				17· 15
			40				40
			20 | 736			20 | 695
			36·16				34·15

In the next statement I have taken the five years of high prices which closed Mr. Thornton's period as the first years of the new period, and have stopped short before the last famine:—

1823	...	...	1 0	1838	...	...	... 0 20
1824	...	...	1 7	1839	...	...	... 0 20
1825	...	...	1 5	1840	...	...	... 0 20
1826	...	...	0 30	1841	...	...	... 0 24
1827	...	...	0 35	1842	...	...	... 0 25
1828	...	...	1 6	1843	...	...	... 1 0
1829	...	...	1 4	1844	...	...	... 1 0
1830	...	...	1 6	1845	...	...	... 0 36
1831	...	...	1 0	1846	...	...	... 0 24
1832	...	...	1 10	1847	...	...	... 0 31
1833	...	...	1 0	1848	...	...	... 1 0
1834	...	...	0 30	1849	...	...	... 0 35
1835	...	...	1 0	1850	...	...	... 1 0
1836	...	...	1 10	1851	...	...	... 1 9
1837	...	...	0 35	1852	...	...	... 0 25
1838	...	...	0 20	1853	...	...	... 0 35
1839	...	...	0 20	1854	...	...	... 0 35
1840	...	...	0 20	1855	...	...	... 1 7
1841	...	...	0 24	1856	...	...	... 1 2
1842	...	...	0 25	1857	...	...	... 1 0
			18· 7				16· 28
			40				40
			20 | 727			20 | 668
			36·7				33·8

Or if we take 25 years in each period from 1818—42 and from 1838—62, we find that in the first period the average rate was 34⅔ seers to the rupee, in

the latter 32½, so that the price of wheat is shown by both calculations to have risen about 6 per cent. in the north-western portion of the district. In other parts, it is probable that improved communications had even, before 1861, caused a relatively greater rise in the price of grain, and it would appear that prices have generally ranged higher in the eastern, and more especially the south-eastern pergunnahs.

In no part of the district, however, can there have been a rise exceeding 10 per cent. in the price of wheat.

COTTON.

II.—1822...	...	Not available.		1842	...	... 17	
1823...	...	0		1843	...	... 15	
1824...	...	22		1844	...	... 14	
1825...	...	19		1845	...	... 14	
1826...	...	14		1846	...	... 22	
1827...	...	30		1847	...	... 18	
1828...	...	25		1848	...	... 12	
1829...	...	21		1849	...	... 22	
1830...	...	34		1850	...	... 18	
1831...	...	25		1851	...	... 21	
1832...	...	22		1852	...	... 22	
1833...	...	14		1853	...	... 22	
1834...	...	20		1854	...	... 18	
1835...	...	25		1855	...	... 14	
1836...	...	14		1856	...	... 19	
1837...	...	19		1857	...	... 18	
1838...	...	15	16 | 333	1858	...	... 10	
1839...	...	14		1859	...	... 10	16 | 27·4
1840...	...	15	20·13/16	1860	...	... 7	
1841...	...	15		1861	...	... 10	17·1/3
		18 | 363				20 | 323	
		20·3				16·3	

The second period closes before the great rise in prices caused by the American War. In 1862 the price was 12 seers, in 1863 it rose to 7:

GOOR.

III.—1822...	...	22		1842	...	... 18	
1823...	...	26		1843	...	... 16	
1824...	...	24		1844	...	... 17	
1825...	...	21		1845	...	... 21	
1826...	...	14		1846	...	... 14	
1827...	...	21		1847	...	... 16	
1828...	...	23		1848	...	... 12	
1829...	...	25		1849	...	... 18	
1830...	...	22		1850	...	... 17	
1831...	...	20		1851	...	... 21	
1832 ..	...	25		1852	...	... 18	
1833...	...	16		1853	...	... 16	
1834...	...	Not available.		1854	...	... 17	
1835...	...	21		1855	...	... 25	
1836...	...	20		1856	...	... 20	
1837...	...	16		1857	...	... 26	
1838...	...	14		1858	...	... 17	
1839...	...	18		1859	...	... 14	
1840...	...	17		1860	...	... 17	
1841...	...	16		1861	...	... 18	
		19 | 381				20 | 358	
		20·1				17·18	

The price of goor has thus risen to a greater extent than that of grain, and less than that of cotton. The rise was in no case very great up to 1861. And even in the pergunnahs to the east in which communications were greatly improved, I do not think that it would be safe to have allowed more than from 8—10 per cent. for rise in prices. As far as I can see, there is as little real ground for Mr. Martin's rise of 25 per cent. as there is for the fall discovered by Messrs. Colvin and Grant.

Mr. Martin unfortunately selected for comparison with Mr. Thornton's average of 20 years a few years which included a famine. Messrs. Colvin and Grant, on the other hand, carefully excluded all years of scarcity, and then compared the result with Mr. Thornton's average, taken from a period which closed with five years of famine prices.

Report on the assessment of Bhooma Sumbulhera.

Situation of the tract under review.

The Pergunnah of Bhooma Sumbulhera forms the south-eastern corner of the Mozuffernuggur District. The following remarks have reference to the upland alone, and the boundaries of the tract now under review are,—to the north, the Pergunnah of Bhookurheree; west, Jansut; to the south, Hustinapore Nelohah of Meerut; and to the east the valley of the Ganges.

Natural features of the tract; castes of cultivators.

2. Bhooma Sumbulhera is intersected longitudinally by two lines of sand hills, and the pergunnah has a large proportion of poor land, as well as much of the very best soil, equal to any in the district. There is further as much difference between the various castes of cultivators as there is in the natural capabilities of different portions of this tract. To the north, the tillers of the soil are for the most part Syuds and Goojurs, to whom very partial and defective irrigation has as yet done comparatively little benefit. To the south, the land is held by strong well-to-do communities of Jâts, who utilize to the utmost the ready means of irrigation placed within their reach, and who, even on the high unwatered tract over-hanging the valley of the Ganges, have brought the cultivation to the highest pitch of excellence. Half way between the Syuds and Goojurs on the north, and the Jâts to the south, are the Jhojhas of Sikunderpore and the cultivators of various castes, who hold the seven uninhabited estates which lie round Meeranpore and Keithora, and who pay in Moobarikpore the highest rent-rates for dry land which I have met with in the district.

Irrigation.

3. As a rule, the western portion of this tract is dry, to the extreme north a few estates receive an uncertain supply of water from the tail end of the Bhookurheree rajbuha, but below Kasimpore, canal irrigation has as yet reached only the most southern village, Hashimpore, and in the intervening tract water is so distant from the surface, that well irrigation does not pay except in the rich garden land round the town of Meeranpore Keithora. On the east side the west main rajbuha supplies Tundhera, and the villages to the south are year by year receiving a larger share of irrigation. Choorialah just to the south of the Futteygurh branch, receives but a scanty supply, but below Mujhera all estates to the south and west of Meeranpore are more or less fully watered.

Former settlement.

4. At last settlement this tract was for the most part in the Meerut District, and with the exception of 12 scattered villages was settled by Sir Henry Elliot. Of the 54 estates in the upland, 25 were in the old Bhoomah Pergunnah, 11 in Sumbulhera, and one belongs to both. These were all transferred to Mozuffernuggur in 1842.

In 1855 five estates were received from Hustinapore Nelohah in Meerut. Of these 44 estates were settled by Sir Henry Elliot in the year 1835, and one by Mr. Plowden. Mr. C. Grant revised the assessment in 1862-63, so that nearly 30 years had elapsed since the previous settlement.

The remaining estates were settled by Mr. Thornton with the pergunnahs to which they belonged, and were transferred to this pergunnah in 1855—1

from Jaolee, 4 from Khutowlee, and 7 from Bhookurheree. The old Pergunnah of Sumbulhera and the added villages of Bhookurheree must at last settlement have been as dry as any other portion of the district, and there can have been little or no irrigation except from the wells of Sumbulhera and Mujherah.

In the old Pergunnah of Bhooma, however, the soil is firm and water is nearer to the surface; and at last settlement not less than 970 acres in the tract under review were irrigated; and as no particulars can now be ascertained regarding some of the finest estates, it is pretty certain that not less than 1,200 acres were watered.

Old assessment and present one stated.

5. At the former settlement no attempt was made to set aside a fixed portion of the rent-roll as the share of Government; and it was allowed that the assessment varied from 50 to 80 per cent. of the assets, and practically the difference was no doubt even greater. There can be no object, therefore, in comparing an assessment professedly at 50 per cent. with one which ranged in indifferent villages from below 50 to above 80. It is sufficient for me to remark that the old jumma of this tract was Rs. 36,406, and that the present assessment is Rs. 35,719, showing a decrease of Rs. 687.

Rent-rates of former settlement and result of their application.

6. The rent-rates assumed by Sir Henry Elliot are given in page 205 of the North-Western Provinces Settlement Reports No. 2. They are in Bhooma, Rs. 3-12-10 on irrigated land, and Rs. 2 on dry; in Sumbulhera, Rs. 3-3-2 wet, and Rs. 1-9-7 dry. If these rates be applied to the areas as entered in the present settlement, the result will be a rent-roll of Rs. 76,406-10-8 and an assessment of Rs. 38,203. But it cannot be allowed that the rates applicable 30 years before were applicable at the recent settlement; and the Meerut report very clearly indicates that the assessment was lowered owing to the difficulty of levying a full demand from so dry a tract in bad years. This argument no longer applies to the larger and richer portion of the tract under review, for to most of the Bhooma villages a fair proportion of canal irrigation has been given.

Estimates of present assets.

7. A fair estimate of the present value of the tract must be arrived at, either by adding a suitable addition to the rent-roll of the dry land for canal irrigation, or by applying to the soil area rates which existing rents prove to be fair,

In the first estimate I have applied Sir Henry Elliot's wet rates to the areas in each of the old pergunnahs which were irrigated at last settlement; to the rest of the area of the present settlement papers I have applied the dry rates of the former settlement.

The result is—

	Rs.	A.	P.	Rs.	A.	P.
Old Pergunnah Bhooma and adjacent villages, 851 acres wet, at Rs. 3-12-10 per acre	3,235	9	2			
17,249 acres dry, at Rs. 2 „	34,698	0	0			
				37,933	9	2
Old Pergunnah Sumbulhera, 119 acres wet, at Rs. 3-3-2 per acre	380	8	10			
16,062 acres dry, at Rs. 1-9-7 per acre	25,682	7	6			
				26,063	0	4
				63,996	9	6
To this must be added 10 per cent. for the rise of prices in 27 years (I make no allowance for general progress) ...				6,399	10	6
				70,396	4	0
There has now to be added the increase to the assets from the 6,661 acres of irrigation not yet considered, which at the Board's moderately assumed rate of Rs. 3 would give ...				19,983	0	0
TOTAL				90,379	4	0

giving an assessment of Rs. 45,189-10.

	Rs.	A.	P.
To put it in another way, the old rates applied to the old areas give a rent-roll of	51,784	5	0
To this must be added for the new cultivation—			
Bhooma, 2,749 acres, at Rs. 2	5,498	0	0
Sumbulhera, 4,074 acres, at Rs. 1-9-7	6,514	2	6
	63,796	7	6
Add 10 per cent. for rise in prices	6,379	10	4
Rs. 3 per acre on 6,661 acres increased irrigation ...	19,983	0	0
Rs.	90,159	1	10

Estimates based on actual rents,

8. But a more trustworthy estimate is that based on the rent-rates fixed before and shortly after settlement. I have divided the pergunnah into two circles, which may be called after the old pergunnahs Bhooma and Sumbulhera. The new circles differ, however, slightly from the old ones, because I have placed the four worst estates of Bhooma in the Sumbulhera circle, and transferred five estates from the northern pergunnah to the circle which they most resemble.

The rates which I have assumed are, I think, fairly borne out by existing rents, and these again are amply confirmed by those fixed on wholly independent grounds in the Meerut District.

BHOOMA CIRCLE.

	Rs.	A.	P.	Rs.	A.	P.
5,371 acres wet meesun, rosli, &c., at Re. 1 per kutcha beegah, or Rs. 6 per acre	32,226	0	0			
507 acres wet 2nd rosli and bhoor, at As. 10 per kutcha beegah, or Rs. 3-12 per acre	1,901	4	0			
6,334 acres dry meesun, &c., at As. 9 per kutcha beegah, or Rs. 3-6 per acre	21,377	4	0			
957 acres dry 2nd rosli, at As. 6 per kutcha beegah, or Rs. 2-4 per acre	2,153	0	0			
5,926 acres dry bhoor, at As. 4 per kutcha beegah, or Rs. 1-8 per acre	8,880	0	0			
				66,546	8	0

SUMBULHERA CIRCLE.

2,102 acres wet meesun, &c., at As. 12 per kutcha beegah, or Rs. 4-8-0 per acre	9,459	0	0			
145 acres wet bhoor, at As. 8 per kutcha beegah, or Rs. 3 per acre	435	0	0			
5,144 acres dry rosli, at As. 7 per kutcha beegah, or Rs. 2-10-0 per acre...	13,503	0	0			
661 acres dry, 2nd rosli, at As. 5 per kutcha beegah, or 1-14-0 per acre	1,239	6	0			
7,124 acres dry bhoor, at As. 3 per kutcha beegah, or Rs. 1-2-0 per acre	8,014	8	0			
				32,650	14	0
Rs. ...				99,197	6	0

which would give an assessment of Rs. 49,598-11-0, instead of the present one amounting to Rs. 35,719, so that if my calculation be correct, the recent settlement involves an annual loss to Government of Rs. 13,879-11-0. This loss is trifling, compared with that incurred in other pergunnahs, partly on

account of the larger proportion of the assets taken at former settlement, partly also because the increase to irrigation has been less marked, so that in this pergunnah a less startling advance was to be looked for.

Examples of under-assessment.

9. Although, however, the loss to Government is less marked, there are many instances of under-assessment not less obvious than elsewhere. It is not, however, so easy to show shortly the under-assessment in each case, for as the former assessment may have been fully 80 per cent. of the assets, the fact that no addition has been made even in the case of estates which have received great benefit from the canal, does not necessarily show that the present assessment is too low. It will, therefore, be necessary for me to go somewhat into details in order that I may be able to support clearly the criticisms which I am about to make.

Hashimpore.

In the township of Hashimpore, irrigation, unknown in Sir Henry Elliot's time, had at the recent settlement been extended to 497 acres, about one-third of the whole area. The old jumma of Rs. 1,941 was retained. In order to make this jumma a half asset one, the Settlement Deputy Collector was forced to fix rates of As. 9-6 wet, As. 6 dry, and As. 3 bhoor, which rates, applied to the cultivated area alone, give a rent-roll of Rs. 4,164-6-0.

Now just to the north of Hashimpore lies the wholly unirrigated estate of Poothie Ibrahimpore, in which for the last fourteen years the rate for good land has been As. 10, and the rate for 2nd rosli and bhoor As. 6, and this rate is abundantly confirmed by the rents of the villages to the south in the Meerut District. There is no distinguishable difference in the soils of these estates, and it is impossible that, as has been implied by the assessment, and as has been practicably asserted by the Deputy Collector, that the excellent irrigated land of Hashimpore should be worth less than the rate paid for unirrigable land of no better quality by the occupancy cultivators of the village to the north and of those on the southern boundary. The evidence both in enhancement and commutation cases shows clearly enough that Re. 1 wet, As. 8 dry, and As. 4 bhoor would have been most moderate rates to assume, and these would give a jumma of more than Rs. 3,000. Irrigation was entirely overlooked, and although the assessment of Poothie is lower than the nikassees warranted, and although the proportion of bhoor is greater than in Hashimpore, the dry village pays a higher rate of assessment than the fairly irrigated one.

Noonee Khera.

In Nonee Khera, irrigation had increased from 49 acres to 420, the jumma rose from Rs. 734 to 850; the proprietors cultivate, and there are no money rents. Had it been necessary to fix such rents, the assessment would have demanded rates of As. 10 wet, As. 6 dry, and As. 4 bhoor.

Sohnjhnee.

In Sohnjnee adjoining Noonee Khera to the north, irrigation unknown at last settlement had been extended at the time of measurement to 42 acres out of 767, but the assessment was reduced from Rs. 1,456 to 1,350. This demanded rates of As. 13-6 wet, As. 7 dry, and As. 4 bhoor, which were accordingly fixed.

Bahadurpore.

In the adjoining estate Bahadurpore, irrigation had increased from 94 acres to 222 out of a cultivated area of 272. The jumma was increased from Rs. 538 to 600. To make this assessment exactly half, asset rates of As. 13 and As. 7 were fixed, although in Tirowlee just to the north the rates fixed were Re. 1 wet, and As. 10 dry; and in Ghataen adjoining Bahadurpore to the south, the jumma assumed just about the same rent-rates.

The new rates fixed in Ghataen Rs. 1-2-0 wet, As. 10 dry, As. 7 2nd rosli, and As. 5-4 bhoor, applied to the correct soil areas, give very little more than double the present assessment, and are abundantly supported by rates fixed by the people in neighbouring estates in Jansut and in Khutowlee and across the border in Meerut.

* Assessment in dry estates, Sikundurpore.

To turn for a moment to the dry estates near Meeranpore. It is difficult to estimate the exact circumstances of Sikundurpore in 1835, but since last settlement cultivation had increased by 416 acres, from 726 to 1,142; the land is admirably cultivated by numerous and industrious Johjahs, and dry as the estate is, the annual cane crop averages 10 per cent. of the area. Sikundurpore is of the same class as Poothie Ibrahimpore, already mentioned; but the jumma of Rs. 900 necessitated rent rates of annas 6½ and annas 3 at the moderate rates of annas 9 dry and annas 4 2nd rosli and bhoor, well below those of Poothie, the assessment would have been Rs. 1,400.

Bubra and Jumalpore.

In Bubra and Jumalpore the new jummas are much lower than the old rates would have given, and in consequence even the nikassees have averaged quite three times the jumma, and they greatly under-state the assets.

Progress of Sumbulhera and Bhooma.

10. Sumbulhera was a poor tract, and canal irrigation is only gradually making itself felt, and the progress of 30 years only made up for the, in this pergunnah, very marked reduction in the share claimed by Government. In Bhooma a large proportion of the land is first class. Canal irrigation has on the east side been plentifully supplied, and it is mainly to the opening of the canal that must be attributed the most striking cases of under-assessment and the most extraordinary instances of inequality. As an additional example of the complete neglect of the change worked by the canal, I would notice the assessment of Rajpore Khoord. Irrigation, unknown before, had been extended to 254 acres out of 493, or to nearly all the good land in the estate.

Mr. Grant, disregarding the deduced revenue rates which pointed to a jumma of Rs. 575, raised the assessment from Rs. 276 to 350; the estimate is now under the Court of Wards; it is proposed to lease it to the cultivators who are ready to give Rs. 1,400, or four times the jumma.

I have not thought it necessary to refer to the assumed rent rates, they were framed for circles in the Bhookurheree and Jansut Pergunnahs, and are, as far as Bhooma is concerned, as unsuited for the tract to which they were last applied, as to those for which they were originally framed.

The estimate which I have given of the assets of this pergunnah is, I believe, a moderate one, and it is most probable that the annual loss to Government from the present assessment is even more considerable than I have stated. Here, however, as in other pergunnahs, there are several estates which might, under the rules, be permanently settled; the five Jat estates, settled probably at quite 80 per cent. on the assets, have, notwithstanding the great progress of the last 30 years, barely advanced so much as to make the old jumma a half asset one, and although needlessly large reductions have been made, the present jummas are, in the case of such estates as Poothie and Ghataen, not much below half assets. I have not, however, made any definite proposals regarding these estates. Bhooma Sumbulhera resembles the rest of the tract between the Ganges and the Kalee, and the present assessment is, as a rule, wholly unsuited for permanence.

CAMP CHITOWRAH,
The 15th October 1869.

A. CADELL,
Settlement Officer.

Rent-rates of Pergunnah Bhooma, Sumbulhera, per kutcha beegah=one-sixth of an acre.

Number.	Name of Village.	Fixed at Settlement by Deputy Collector.			Fixed since Settlement by Private Agreement.				Fixed in Court.				Remarks regarding rent-rates fixed by private agreement and in Court.
		Wet.	Dry.	Bhoor.	All round.	Wet.	Dry.	Bhoor.	All round.	Wet.	Dry.	Bhoor.	
		Rs. A. P.	Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
1	Babra (uninhabited) ...	...	...	...	...	...	0 8 0	...	...	...	{ 0 9 0 / 0 8 0 }	...	For 150 acres by private agreement, more than half the estate in 1274. In Court, for 6 acres commutation.
2	Bahadurpore ...	0 13 0	0 7 0	...	...	...	...	...	...	...	0 9 0	...	In abatement case the wet rate was reduced for 25 acres discovered to be dry.
3	Bhooma, 12 Biswas ...	{ 0 10 0 / 0 7 0 }	0 6 0	0 3 0	...	...	...	...	...	1 0 0	...	...	Fixed in enhancement case for 5 acres ... { ¾ of this mouzah, including all the best land held by proprietors or occupancy tenants.
4	Ditto, 8 Biswas ...	0 10 0	0 6 0	0 3 0	...	0 14 0	...	...	...	...	...	...	For some 5 acres.
5	Poothie Ibrahimpore ...	...	...	...	...	...	0 10 0	0 6 0	...	...	...	...	For the whole estate. some 400 acres, fixed 10 years before settlement. Some of the 6 annas land is better than bhoor.
6	Tiroula ...	1 0 0	0 10 0	...	...	...	...	...	...	...	...	...	
7	Tekoula ...	...	{ 0 8 0 / 0 6 0 }	...	...	...	0 10 0	...	...	...	...	...	Cultivators only just settled in this estate, 10 annas rate for 9 acres.
8	Tundhera ...	{ 0 12 0 / 0 11 0 }	{ 0 6 0 / 0 5 6 }	0 3 0	...	1 8 0	0 12 0	...	...	...	...	...	Fixed for 7 acres wet and 10 dry for 5 years.
9	Jumalpore Bangur (uninhabited).	...	0 5 3	0 3 0	...	...	...	...	...	...	0 6 0	...	Fixed on basis of nikassees for 43 acres.
10	Digdhera (uninhabited) ...	...	...	...	...	...	...	...	0 6 6	...	...	..	In commutation on basis of nikassees.
11	Rajpore Khoord (ditto)...	...	...	...	...	0 10 0	0 6 0	0 3 0	...	...	...	...	Short lease fixed at settlement at three times jumma. The Zemindar is now dead, and the Jats offer a sum which would give rates of 14 annas, 8 annas, and 4 annas.
12	Ditto Kulan ...	1 0 0	0 8 0	...	...	...	...	...	...	...	...	...	
13	Rusoolpore ...	...	0 6 6	0 3 0	...	...	0 8 0	0 4 6	...	...	...	...	For 292 acres.
14	Sikhrera, 5 Biswas, Jumyuth Ali.	...	...	...	...	...	...	...	...	...	...	...	
15	Sikhrera, 5 Biswas, Ali Buksh.	...	...	...	...	...	...	...	...	...	...	...	
16	Sikhrera, 10 Biswas ...	...	...	...	...	...	...	...	...	...	...	...	
17	Sumana (uninhabited) ...	...	...	...	...	...	...	...	0 6 0	...	...	...	In commutation would give rates of 7 annas dry rosli and 4 annas dry bhoor.
18	Sohnjnee ...	0 13 6	0 7 0	0 4 0	...	...	...	...	...	...	...	...	
19	Sikundurpore ...	...	0 6 6	0 3 0	...	...	...	...	...	...	...	0 3 0	In suit for abatement.
20	Kooraie ...	0 12 0	0 7 0	0 4 0	...	1 4 0	0 12 0	0 5 0	...	0 12 0	...	...	By private agreement for 14 acres by me for a few acres of second rate land, irrigated by lift.
21	Kheree Suraie ...	0 11 0	0 7 0	0 3 0	...	0 14 0	0 8 0	0 4 0	...	0 14 0	0 9 0	...	By private agreement for 1,285 acres. In enhancement case for 15 acres.
22													
23	Kithoura ...	...	...	...	...	...	...	...	...	...	...	...	
	Ghatayun Shimallee ...	0 14 0	0 7 0	...	...	...	...	...	...	...	...	...	An enhancement case is now pending.
24	Ditto Janoobee ...	0 14 0	0 7 0	...	...	...	...	...	...	{ 1 2 0 / 0 12 0 }	{ 0 10 0 / 0 7 0 }	0 5 4	For whole estate 685 acres; the lower rates are for 2nd rosli.
25	Moobarikpore (uninhabited).	...	...	...	...	...	0 10 0	0 5 0	...	...	...	...	These are average rates for 30 acres. The rate for really good "danar" rises as high as 12, and the whole estate is well away from any part of Meeranpore.
26	Muhmoodpore (uninhabited).	...	...	...	...	...	...	...	...	...	{ 0 9 0 / 0 6 0 }	0 4 0	The 6 annas rate is for rosli 2nd. These rates were fixed in commutation on the basis of the nikassees for the whole mehal 365 acres.
27	Ditto, 6 Biswas (ditto)...	...	...	...	...	...	...	...	...	...	{ 0 9 0 / 0 6 0 }	0 4 0	For whole mehal, 152 acres in commutation case.
28	Meeranpore ...	...	...	...	...	1 5 0	0 12 0	...	...	...	...	...	For 19 acres of altogether exceptional land on portions of the Meeranpore site.
29	Nonee Khera ...	...	...	...	...	...	...	...	...	...	...	...	Jat Bhaiacharah rents taken in kind.

Rent-rates of Pergunnah Bhooma, Sumbulhera, per kutcha beegah=one-sixth of an acre,—continued.

Number.	Name of Village.	Fixed at Settlement by Deputy Collector.			Fixed since Settlement by Private Agreement.			Fixed in Court.				Remarks regarding rent-rates fixed by private agreement and in Court.
		Wet.	Dry.	Bhoor.	Wet.	Dry.	Bhoor.	All round.	Wet.	Dry.	Bhoor.	
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
30	Hashimpore 1 Biswa	}	}	}				...	1 0 0	0 8 0	0 6 0	In commutation and enhancement cases for 659 acres.
31	Ditto ½ ditto								0 14 0	0 7 0	0 3 0	
32	Ditto 3 ditto											
33	Ditto 7 ditto											
34	Ditto Mehal 2 ditto	0 9 0	0 6 0	0 3 0				...				
35	Ditto 3 ditto											
36	Ditto 1 ditto											
37	Ditto ½ ditto											
38	Ditto ½ ditto											
1	Tuperpore (uninhabited)	0 6 0	0 4 0	...				...	0 10 0	0 5 0		For 6 acres. The land is second rate.
2	Toourheree, Oorf Surbra-pore	0 9 0	0 6 0	0 3 0				...				
3	Jurwur (Goojurs)	...	0 6 0	0 3 0				...	...	...		The Re 1-4 rate is for a few acres near the village. The 8 annas rate was fixed in commutation in the
4	Chooriala	...	...	...				...	0 4 0	...		
5	Hydurpore	0 6 0	0 4 0	0 3 0				...				By private agreement for 28 acres. In commutation on basis of nikassees for 426 acres. The rates below the line are for Syuds.
6	Sumbulhera	...	...	...	1 1 0			...				
7	Sheoporee (Goojurs)	...	...	...				...				The 6 annas rate is for second rosli The rates were fixed on basis of nikassees in commutation case for 277 acres.
8	Kasimpore Khola	...	0 5 6	...				...	1 0 0	0 8 0		
9	Ditto Bhooma								0 12 0	0 7 0		
10	Katia	0 6 0	0 4 0	0 3 0					0 11 0	0 6 0		
11	Kutubpore	0 9 6	0 5 0	0 2 6					0 10 0			
12	Kasimpore Jusmour	...	...	...								
13	Markunpore	...										
14	Majhera	...	...	...				...				For 500 acres. The soil is very second rate.
15	Nizampore (Goojurs)	...	...	...				...	...	...		
16	Nugla Khupur	0 8 0	0 5 0	0 3 0				...				

Report on Pergunnah Mozuffernuggur.

The pergunnah of Mozuffernuggur forms the west central tract of the Ganges and Kalee Dooab in this district. It is bounded on the north by Poor Chupar; on the east by Bhookurheree and Jansut; on the south by Khutowlee; and on the west, as far as this report is concerned, by the Kalee River; for the thirteen estates beyond the river are away from canal irrigation, and do not come within the scope of this review.

Position of the pergunnah.

2. The pergunnah is traversed by a line of sand-hills, which affects the character of the soil in the western and south-western portions of the pergunnah. But the influence of the bhoor is not felt at a great distance from the higher sand, and many of the villages abutting on the sand-hills are in everything, except in the average which is affected by the bhoor, first class.

Natural features.

Areas of Assessed Estates in Pergunnah Mozuffernuggur, east of Kalee, according to Settlement Papers.

	Wet.	Dry.	Total.
Meesan ...	4,059	177	4,236
Rosli ...	14,052	6,093	20,145
Dakar ...	1,160	233	1,393
Second Rosli ...	507	2,084	2,591
Bhoor ...	418	5,149	5,567
	20,196	13,736	33,932

New fallow, 4,312; old fallow, 2,933
Present jumma ... ... Rs. 56,822
Former „ ... ... „ 48,384

In considering the capabilities of the pergunnah, I have divided the estates into three classes; the first class containing those estates which are situated west of the sand ridge, and, speaking generally, to the north of the Mozuffernuggur and Jansut road. The second class contains those generally to the south of this line, and those to the north which lie near the river, and have a lighter soil than their neighbours on the level upland. The third class comprises especially poor villages wherever situated. Mr. Martin's classification had reference mainly to position, and this necessitated the very worst and the very best villages being placed in the same circle, if the sand ridge on which the former was situated happened to be near the fruitful plain which composed by far the greater portion of the latter.

3. Mozuffernuggur was at Mr. Thornton's settlement in a condition superior to that of its neighbours to the north and west; the best circle was situated in a dip, and well irrigation had been provided for 2,495 acres. But water was then distant from the surface, and even where wells existed irrigation was tedious and expensive. The old wet rates, therefore, do not, in my opinion, give an adequate estimate of the value of irrigated land now when canal irrigation is general, and when, if well irrigation is resorted to, the water is near the surface, and to raise it is comparatively easy and inexpensive. I have not on his ground availed of Mr. Thornton's wet rates, which even in pergunnahs not affected by the canal are greatly lower than the present rent rates warrant. The application of Mr. Thornton's dry rates with the addition of 10 per cent., which, as my note regarding Poor Chupar shows, is a very moderate allowance for the increase in prices, and the ordinary progress of 20 years would have given a rent-roll of Rs. 92,429-12. To this sum must be added the increase due to the irrigation of 2,495 acres, which at the rate of Rs. 3 per acre would bring up the assets to Rs. 99,914; this would leave only Rs. 13,729 to represent the increase due to an addition to the irrigation of 17,701 acres. To turn to another estimate, the old 65 per cent. jumma of these 50 estates, Rs. 48,384, involved assets amounting to Rs. 74,437, which the addition of 10 per cent., as before, would bring up to Rs. 82,726.

Condition of the pergunnah at former settlement, and estimate of change worked by the canal.

In addition, however, to the great increase to the irrigation, there has been a small addition since last settlement to the assessable cultivated area—681 acres having been added from lapsed maafees, and 780 being new cultivation; at Rs. 3 per acre this would give a rental of Rs. 4,383, which would bring up the rental of the tract

Note.—The increase to the cultivated area has really been greater, but the pergunnah was measured in a year of drought, and much ordinarily cultivated land was entered fallow.

to Rs. 86,264; so that Rs. 27,380 have been supposed to form a suitable equivalent to the great increase of irrigation, and the radical change in the agriculture of the pergunnah caused by the opening of the canal.

The conclusion to which estimates lead proved by the rates fixed since settlement.

4. These estimates can hardly fail to lead to the conclusion that the assessment is inadequate, but that it is not so extraordinarily low as in surrounding pergunnahs. But neither of those estimates gives an adequate idea of the great progress made in this tract since 1841, and neither of them gives a sufficient estimate of the true value of the land.

It is, therefore, fortunate that the numerous money rates fixed about the time of settlement, and in subsequent years, set forth so fully and unquestionably the great value of land in this tract. It will be seen from Appendix I that but few of these rates have been fixed in Court, and I may fairly state that those so fixed high, as they may appear when compared with those of the settlement year, have been invariably acquiesced in, and in most cases gladly welcomed by the people.

Regarding the first class especially, the rates prevailing leave little doubt that in the first circle for irrigated land, excluding bhoor, the rates which have recently been fixed, Rs. 1-4, in estates where the landlord has provided means of irrigation, and Rs. 1-2 in those in which the expense of channels and outlets has been defrayed by the cultivators, are fair rates to assume. The wet rates fixed by the Deputy Collector at settlement average about annas 12. As these rates were fixed here as elsewhere, on the assumption that the assessment must at all hazards be made a half asset one, the nikassees of estates in which these rates are generally fixed bear out the jumma. In estates, on the other hand, in which the zemindar was allowed to fix his rents with the concurrence of his tenants, the result was very different.

Ratheree.

The maafee village of Ratheree is a striking instance: this estate is situated in the middle of the first circle; the land is good, but there is a considerable portion of light soil on a higher level, which no doubt irrigable is seldom watered. The zemindar's influence kept the cultivators out of the Settlement Court, and immediately after settlement a rate of Rs. 1-4 was fixed for nearly half the estate held by occupancy tenants—for one-third, also held by tenants with rights, a rate of Rs. 1-1-3 was agreed to. For the old khoodkhast close to the village rates averaging Rs. 1-12, and for land throughout the estate, rates of about Rs. 1-8 were fixed.

The assumed jumma, according to the deduced revenue rates, was Rs. 1,250, while the rent-roll began at Rs. 3,750, and is now about four times the assumed assessment. Adjoining Ratheree is the uninhabited estate of Nusseerpore. The net assets were calculated to amount to Rs. 1,850, and a jumma of Rs. 900 was at first fixed, but this was afterwards raised to Rs. 1,000. The first nikassee after settlement showed a rent-roll (derived from fixed money rents) of Rs. 3,350, a rate of Rs. 1-3-11 per kutcha beegah having been fixed for three-fourths of the estate. As the rates paid by those cultivators who were at first exceptionally treated were amicably enhanced, the rent-roll rose in 1275 to Rs. 4,290, and in a recent suit I enhanced the lower rate paid by a few tenants with rights of occupancy to Rs. 1-2 for irrigated land. The average rates now are Rs. 1-2 for tenants-with-rights, and Rs. 1-6 for tenants-at-will, and the jumma, instead of 50 per cent., is less than 23 per cent. of the assured assets. Only Rs. 2-14 had been added to the former jumma to meet an increase of irrigation from 17 acres to 589.

Tiguree.

To take another example: Tiguree rise to the east of the bhoor ridge. Since Mr. Thornton's settlement, cultivation had increased 100 acres, and irrigation, unknown before, had been extended to 249 acres. The assessment was raised from Rs. 340 to Rs. 500, the inadequacy of which jumma is shown by the fact that the cultivators promptly took a lease of the estate for Rs. 1,809.

The insufficiency of the assessment is, moreover, clearly enough shown by Mr. Martin himself. Being asked what the jumma would be if the canal were to fail, he suggests the application of the very moderate dry rates, annas 6 for rosli and annas 3 for bhoor. These rates give a rental of Rs. 1,190, and a jumma nearly Rs. 100 in excess of that fixed. The jumma appears to have been fixed on the basis of the nikassees, including those for years before the opening of the rajbuhas, and in the face of the deduced revenue rates, which give a jumma of Rs. 830.

5. The insufficiency of the assessment is not of course in every case shown so clearly by the village rent-rolls, but in many instances the inadequacy of the assessment and of the rent-roll fixed in accordance with it are as clearly proved as in any of the villages which I have as yet enumerated.

Medhpore.

In Medhpore, notwithstanding the entry of 219 acres of irrigation, out of a cultivated area of 240 in an estate, too, which before the settlement was dry, the jumma was raised from Rs. 227 to Rs. 250. Mr. Martin remarks that as the process (of fixing money rents) had been conducted irrelative of any consideration as to fitness of jumma, the correctness of the revised demand was placed beyond question; but this may be doubted.

The rent-roll of Rs. 518, rendered necessary a wet rate of annas 6, and a dry rate of annas 4, and the Medhpore 6 anna fields adjoin the Rs. 1-4 land of Budheree, and some of the best of the Sisaona land with its average rate of Rs. 1-1.

Sisaona.

This estate of Sisaona is another prominent example of the insufficiency of the present jumma. Cultivation had increased by over 200 acres, irrigation by over 1,000. This extraordinary improvement of the estate was met by a rise in the assessment from Rs. 1,641 to Rs. 2,200. Notwithstanding that the lowest rates fixed in this circle, annas 11 wet and annas 6 dry, were applied to the estate, the assets even at these figures would have been Rs. 5,019-4; but as the zemindars fixed rents for a portion of the estate, the rent-roll rose to Rs. 5,650; and if the rates which were fixed by private agreement for the 318 acres—by no means the best in the estate—were applied to the whole mehal, the rent-roll would be Rs. 7,420, and a moderate assessment Rs. 3,500.

Explanation of underassessment.

6. The only explanation of these and other assessments is the supposition that they were fixed before it had been definitely decided whether canal assets were to be taken into account; this supposition is confirmed by the criticism written on No. II Statement of Shahabooddeenpore. Cultivation had increased by 250 acres, and irrigation from 23 acres to 558, the jumma was raised from Rs. 972 to Rs. 1,200.

The Commissioner's remark is as follows:—*"Except that, in my opinion, the assessment should not be enhanced with reference to canal irrigation; this would be too low."* The same remark might, with equal justice, have been made regarding nearly every estate in the pergunnah which receives a plentiful supply of canal irrigation.

Rough estimate of assets of pergunnah.

7. I now proceed to give a rough estimate of what a fair assessment would be. I have divided the pergunnah into three circles, and have only so far changed the classification of soils as to place 2nd rosli with bhoor instead of with rosli of the best kind.

The result is—

	Rs.	As.	Rs.	As.
1st Circle.				
11,956 acres wet rosli, at Rs. 1-2 per kutcha beegah, or Rs. 6-12 per acre	80,703	0		
296 acres wet rosli, 2nd class, at As. 12 per kutcha beegah, or Rs. 4-8 per acre ...	1,332	0		
1,704 acres dry rosli, at As. 10 per kutcha beegah, or Rs. 3-12 per acre	6,390	0		
2,155 acres dry 2nd rosli and bhoor, at As. 4 per kutcha beegah, or Rs. 1-8 per acre	3,232	8		
			91,657	8
2nd Circle.				
6,335 acres wet rosli, at Re. 1 per kutcha beegah, or Rs. 6 per acre	38,010	0		
444 acres wet 2nd rosli, at As. 10 per kutcha beegah, or Rs. 3-12 per acre	1,665	0		
2,608 acres dry rosli, at As. 8 per kutcha beegah, or Rs. 3 per acre	7,824	0		
2,611 acres dry rosli 2nd and bhoor, at As. 4 per kutcha beegah, or Rs. 1-8 per acre	3,916	8		
			51,415	8
3rd Circle.				
980 acres wet rosli, at As. 12 per kutcha beegah, or Rs. 4-8 per acre	4,410	0		
185 acres wet rosli 2nd, at As. 8 per kutcha beegah, or Rs. 3 per acre	555	0		
2,191 acres dry rosli, at As. 6 per kutcha beegah, or Rs. 2-4 per acre	4,929	12		
2,467 acres dry rosli 2nd and bhoor, at As. 3 per kutcha beegah, or Rs. 1-2 per acre	2,775	6		
			12,670	2
			1,55,743	2

giving a jumma of Rs. 77,872, instead of Rs. 56,822, that fixed.

8. The rates which I have applied are, I think, fairly borne out by those in the appendix. At first sight there might be doubt as to the applicability of the bhoor rates assumed, but when rates have been fixed for bhoor land, they have been applied not to the cultivated area alone, but to cultivated bhoor and fallow, and even the barren land, and as the fallow more than equals the bhoor in extent, the rates shown in the appendix for this soil in no way impugn those assumed by me.

Assumed rent rates justified.

Of the rent rates assumed by Mr. Thornton for this soil in Mozuffernuggur Pergunnah, only one is less than the higher of the two rates assumed by me, and that one only by five pie. The rate assumed for the first circle, that of Puchenda Kulan, was Rs. 1-12, and the second-rate Rs. 1-8-8.

9. In the foregoing remarks I have paid no attention to the assumed rent rates, and I cannot discover that they in any way influenced the assessment. In the pergunnah note book there is no mention of the soil classification on which the assumed rent rates depend, and the jumma appears to have been fixed frequently on the basis of the nikassees, but often on the average given by the nikassees and Mr. Thornton's rates. The assumed rent rates appear to have been calculated later, in order to fill up the columns in the No. II Statements. These rates to a certain extent bear out my calculations, as they give a rent-roll of Rs. 1,32,068 and an assessment of Rs. 66,034, just about Rs. 10,000 above that fixed.

Mr. Martin's assumed rent rates.

10. It cannot be objected to this result that bhoor is understated, for the natural differences in soils are in this pergunnah correctly entered. The meesun or manured land, on the other hand, so far from being overstated, does not even equal the average area under cane, cotton, and moonjee, or finer rice in a single year, and, instead of 4,233 acres as entered, can hardly be less to judge from the nikassees than 10,000, and canal irrigation has been understated by 4,000 acres in this tract.

Possible objections met.

Were the entries, therefore, thoroughly amended, the assessment given by the rent rates of Mr. Martin would nearly equal that estimated by me. The assessment appears to have been kept down partly by a too complete confidence in the nikassees and partly it may be by doubt as to the good done by the canal. Whatever may have been the cause, it is clear that the assumed rent rates, the nominal basis of the assessment given in Appendix II, condemn those fixed by the Settlement Deputy Collector in order to make the jumma a half asset one.

11. The general result of my examination of the assessment of this tract is, that the fully irrigated estates are, with one or two exceptions, ineligible for permanent settlement on account of the inadequacy of the jummas, and that the inferior properties are precluded from permanent settlement by the prospect, already in a great measure fulfilled, of a large increase to the irrigation from the canal.

General result of investigation.

It is further evident that if my estimate be correct, Government loses annually by the assessment of the 50 estates in this tract a sum of not less than Rs. 20,000, which might be secured to the State without hardship to any one, and without in the slightest degree neglecting that moderation, the necessity of which is constantly impressed upon Settlement Officers.

I have not in the course of these remarks thought it necessary to deal with the estates to the west of the Kalee River, as these villages will most fitly be taken up with the adjoining pergunnahs of Bugra and Charthawal. As a rule, these estates are dry, as most of them are, more heavily assessed than the plentifully irrigated villages of the pergunnah. Mr. Thornton's jummas have generally been maintained, and the gradual improvement during 20 years has not done more than make up for the difference in the proportion of the rental now taken from the proprietors. If it be definitively decided that no canal is to be brought into this tract, the settlement of many of these estates might, under the rules, be declared permanent.

A. CADELL,

Settlement Officer.

Camp Chitowra,
The 15th October 1869.

APPENDIX I.

Showing rent rates fixed at Settlement by the Deputy Collector, and those fixed since in Court or by private agreement, Pergunnah Mozuffernuggur.

Number.	Name of Village.	Rent Rates per Kutcha Beegah fixed at Settlement.			Rent Rates fixed by private agreement at and since Settlement.				Rent Rates fixed in Court.			Remarks.
		Wet.	Dry.	Bhoor.	All round.	Wet.	Dry.	Bhoor.	Wet.	Dry.	Bhoor.	
	1st Class.	Rs. A. P.	Rs. A. P.	Rs. A P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
1	Almaspore	0 12 0										
2	Baghounwallee ...	0 12 6	0 7 0	...	...	1 1 0	...	...	...	...	...	In 1274 for 32 acres, the only land for which rates were not fixed at settlement.
3	Bajheree	1 0 1 0 15 8 0 14 3	...	...	...	1 0 0	...	...	...	...	...	Fixed just after settlement.
4	Badheree	0 13 6	0 8 0	...	...	1 4 0	0 10 0	...	...	...	...	For 123 acres wet and 35 dry, chiefly in 1273-74 Fuslee.
5	Bilaspore	...	...	...	0 11 0	...	...	...	...	...	...	198 acres are let for Rs. 819-5-6, but distribution is impossible, as the area entered wet is three times as great as it ought to be.
6	Beharee Bech Puttee ...	...	...	...	...	1 0 0	...	0 6 0	...	...	...	For 233 acres wet and 6 bhoor, fixed in 1274.
7	Beharee, Puttee Pahar Khan	...	...	...	...	1 1 6	...	0 6 0	...	...	...	For 116 acres wet and 7 bhoor, fixed in 1274.
8	Bhikee	0 11 0	0 6 0	0 3 0								
9	Pachendah Kalan ...	0 12 6	0 7 0	...	...	1 1 0	...	...	...	...	...	For 439 acres, fixed shortly after settlement.
10	Chandpore	0 11 0	0 5 0	0 3 0								
11	Datiannah	0 11 6	0 6 0	0 2 0	...	1 0 3	...	0 4 0	1 3 0 1 2 0 1 0 0 0 11 0	0 9 0	0 5 6	By private agreement for 25 acres wet and 2 bhoor, 1274. In Court for 658 acres wet, 100 dry, and 17 2nd rosli and bhoor, chiefly in 1868. The average wet rate is Rs. 1-2.
12	Ratheree ...	...	...	...	...	2 0 0 1 10 0 1 0 6 1 8 0 1 4 0 1 1 3	...	...	1 4 0	0 10 0	...	By private agreement, chiefly in 1277, rates averaging Rs. 1-4-4 were fixed for 462 acres; recently the Rs. 1-1-3 rate has been raised in Court to 1-4-0. so that the rates now are Rs. 1-4 for about 500 acres: rates averaging Rs. 1-10 per pucca beegah for 32 acres, and annas 10 for a few acres dry; the rates for occupancy cultivators are Rs. 1-4 wet and annas 10 dry.
13	Sisaona ...	0 11 0	0 6 0	...	...	1 1 0	0 6 0	...	...	...	...	Fixed for the most part immediately after settlement for 287 acres wet and 31 dry; the dry is second rate, being on the slope towards the river; the wet rate range from annas 8 for privileged cultivators to Rs. 1-12.
14	Sherenuggur ...	0 14 0 0 11 0	0 6 0	0 3 0								
15	Kookara ..	0 11 0 0 10 3	...	...	...	0 14 0	0 8 0	...	...	...	...	For 22 acres wet and 5 dry.
16	Kheree ...	...	...	...	...	0 12 0	0 8 0	...	...	...	...	For 48 acres wet and 3 dry, fixed in 1274.
17	Makhialee ...	0 12 6	...	0 5 0	...	...	...	...	...	...	...	Rates for whole estate fixed at settlement.
18	Moostafabad ...	...	...	...	...	1 1 6	0 10 0	...	...	...	...	For 316 acres wet and 7 dry in 1274 Fuslee: the annas 14 rate for privileged cultivators brings down the average which would otherwise be Rs. 1-4 and rises as high as Re. 1-6, and Rs. 1-6 for Pahekashts.
19	Meghakheree ...	0 12 0	0 7 0	...	...	1 0 6	...	...	...	...	...	For 6 acres in 1274.
20	Naseerpore ...	...	...	...	1 3 3	...	...	...	1 2 0	...	...	By private agreement in 1274 for 472 acres wet and 2 dry; but the dry area is considerably understated. Rates of Rs. 1-2 fixed in Court for 25 acres.
	2nd Class.											
1	Bijoopoora											
2	Bhaladhurpore ...	0 11 6	0 6 0	0 3 0								

Number.	Name of Village.	Rent Rates per Kutcha Beegah fixed at Settlement.			Rent Rates fixed by private agreement at and since Settlement.				Rent Rates fixed in Court.			Remarks.
		Wet.	Dry.	Bhoor.	All round.	Wet.	Dry.	Bhoor.	Wet.	Dry.	Bhoor.	
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P	
3	Buhmunkeree ...	...	...	...	0 9 6	...	...	...	...	...	...	For 132 acres would give according to khusrah rates of annas 12 and annas 5; but the area entered wet is five times the average irrigation of five years and 3½ times the irrigation of the two fussils in which most land was watered.
4	Bibeepore ...	...	...	...	...	...	...	...	...	...	...	No money rents.
5	Pachendah Khoord ...	...	..	...	...	1 0 0 0 10 0	0 8 0	0 2 0	...	...	...	The whole estate is given on a lease, and as much of the land is sand, there is irrigated bhoor.
5A	Tigree ...	...	...	...	...	0 14 0 0 10 0	0 8 0	0 3 0	...	...	...	In whole estate 674 acres fixed just after settlement.
6	Jutmejhera.											
7	Jaraodah.											
8	Rampore ...	0 8 0	0 6 0	...	...	1 8 0 1 4 0 0 12 0	0 6 0	...	1 2 0 0 13 0 0 12 0	0 6 0	...	For 350 acres the highest wet rates are for the level land, the lower for that on the slope towards the river; the dry land is all on the slope: the highest rates are paid by pahis.
9	Reie.											
10	Surwut ...	0 11 0	0 7 0	...	0 13 7	...	...	...	...	...	...	The wet area is greatly overstated; fixing the irrigated area at half as much again as the average of five years, we get rates of annas 15-6, annas 8.
11	Sahaolee	...	...	...	...	...	...	...	1 0 0	0 6 0	0 4 0	For 152 acres the dry land not absolutely bhoor is sandy.
12	Sandhaolee.											
13	Sujaroo	0 10 0 0 8 0	0 6 0	...	...	0 14 0	0 8 0	...	...	...	...	62 acres fixed in 1274 and following years.
14	Shahabooddeenpore ...	0 11 0	0 6 0									
15	Sherepore.											
16	Humayunpoor (uninhabited.)											
17	Mirzapore.											
	Mozuffernuggur, Puttee Aboosyed.											
	Mozuffernuggur, Puttee Syed Taha.											
18	Mozuffernuggur, Puttee Awuz Ali.	0 11 0	0 7 0 0 5 0	...	...	0 14 0	0 6 0	...	...	...	...	For 226 acres; the dry land is sandy and on the slope.
	Mozuffernuggur, Puttee Nusseeroola Khan.											
	Mozuffernuggur, Puttee Wajee-hoo-deen.											
19	Medhpore	0 6 0	0 4 0	...	...	...	...	...	...	...	...	This estate, with the exception of 6 acres, is held by occupancy-tenants, for whom rates were fixed at settlement; the Rs. 1-4 land of Badheri adjoins the annas 6 land of Medhpore.
20	Nara	...	...	...	...	1 0 0	...	...	...	...	...	For 8 acres; for the rest rents in kind are taken.
21	Nirana	0 11 0	0 6 0	0 3 0	...	0 12 0	0 8 0	0 4 0	...	...	...	For 42 acres fixed in.
									1 0 0	0 9 0	...	For 23 acres in enhancement case before Collector.
22	Wailnah	...	...	...	...	...	...	...	0 14 0	0 8 0	...	For 6 acres in commutation rates based on nikassee.
23	Yuzufpore (uninhabited)	...	...	...	0 13 0	...	...	...	...	...	...	In 1274 for 146 acres, nearly all irrigated.
	3rd Class.											
1	Barhwala.											
2	Bundoorah.											
3	Khampore	...	...	...	...	0 12 0	0 8 0	...	...	...	...	For 79 acres fixed just after settlement.
4	Banderah	...	...	...	...	0 12 0	0 7 0	0 4 0	...	...	...	For half the estate, about 400 acres.
5	Salajuddee	...	...	...	...	0 12 0	...	0 3 0	...	...	...	The whole estate on lease for 5 years; rental fixed before settlement.
6	Sikerah.											
7	Kamheree.											
8	Mimlanah.											

APPENDIX II.

Showing assumed rent rates of Mr. Martin's settlement.

Name of Circle.	Class of Soil.	Assumed rent rates. Irrigated. Rs. A. P.	Assumed rent rates. Unirrigated. Rs. A. P.
Mozuffernuggur ...	Meesan ...	5 10 7½	5 5 10½
	Rosli ...	4 3 7	2 12 2½
	Dakur ...	3 12 0	2 2 3¾
	Bhoor ...	1 13 11	1 12 9
Bhoor ...	Meesan ...	5 12 4	
	Rosli ...	4 1 5½	5 5 9½
	Dakur ...	3 11 6¼	2 14 11½
	Bhoor ...	2 9 10	2 10 8
			1 14 0
Pucheeda Kulan ...	Meesan ...	5 12 4	
	Rosli ...	5 6 5	5 6 2
	Dakur ...	2 12 6¾	2 14 11½
	Bhoor ...	...	2 10 8
			2 2 0¾
Chupar ...	Meesan ...	7 8 3½	
	Rosli ...	4 1 4½	5 6 3
	Dakur ...	4 9 3½	2 14 10½
	Bhoor ...	...	1 14 0

Nominally there are four circles; practically there are 15. In many cases the variations in the rates are trifling; in some few they are, however, very important. For the village of Koohra, for example, the following rates were assumed:—

	Wet.	Dry.
Meesan	9 8 8	
Rosli	5 6 8½	4 4 9
Dakur	4 14 9	4 9 5¼

These rates, however, had no important effect on the jumma and none on the rent rates; 13-14ths of the estate are irrigated. Yet the average rent rate fixed by the Deputy Collector just about equals the lowest dry rate assumed by Mr. Martin.

Report by A. Cadell, Esq., *Settlement Officer, on the Assessment of the Bhookurheree Upland,—dated Camp Chitoura, the 13th October* 1869.

Position of tract under review.

The pergunnah of Bhookurheree in the Mozuffernuggur District is bounded on the north by Poor Chupar, on the west by Pergunnah Mozuffernuggur, and to the south by Jansut and Bhooma Sumbulhera. On the east the pergunnah is bounded by the Ganges; but this report has nothing to do with the khadir, and the high bank, which looks down upon the valley of the Ganges, forms the eastern boundary of the upland tract now under review.

Comparison with Poor Chupar.

In fertility Bhookurheree is, on the whole, inferior to Mozuffernuggur, but above Poor Chupar, to which pergunnah it is very similar both in respect to its natural capabilities and artificial advantages. The Bhookurheree upland, however, has the advantage of having a much larger Jât population than Poor Chupar, and hardly any Goojurs. Goojurs are the prevailing caste in only ten of the smallest and least valuable estates, while throughout the best portion of the pergunnah Jâts are the chief caste of cultivators, and are second to the south by the almost equally good tribe of Jhojhas. But the chief point of resemblance between the two pergunnahs is the similarity of soil, the great distance of water from the surface, and the marvellous change which has been worked by the canal.

Natural features of pergunnahs.

Here, as in Poor Chupar, the extent of bhoor and the want of water must have been the chief characteristics thirty years ago. Now, as far as can be made out, the proportion of bhoor in the Bhookhurheree upland is about four per cent. less than in Poor, or 21 per cent. of the cultivated area.

Change worked by the canal.

The increase of irrigation has been almost identical in the two tracts, both traversed by the Ganges Canal and both watered by numerous distributing channels. Here, too, Bhookurheree has a slight advantage over Poor Chupar, for in the former pergunnah every estate on the upland receives canal irrigation, and no village is entirely dependent upon the tail end of a rajbuha.

In Poor Chupar irrigation had increased at the time of settlement from 53 acres, recorded in Mr. Thornton's papers, to 26,284 recorded in those of Mr. Martin. In Bhookurheree the irrigated area of the old settlement amounted to 189 acres, while in Mr. Grant's papers 25,350 acres are entered wet.

Neglect of great increase to cultivation and irrigation shown by assessment.

Here, as in Poor Chupar, it might fairly have been expected that so enormous an increase to the irrigation, coupled with an addition of 9,360 acres to the cultivated area, would have furnished ample ground for a considerable advance upon the former assessment; but no such increase has been secured, the new assessment on the 60 upland estates being only Rs. 55,951, while the former one was Rs. 48,198.

The neglect to secure to Government any considerable portion of the increased assets is the more remarkable, because, as in Poor Chupar, even if we suppose for the moment that irrigation is practically unknown, the dry rates of Mr. Thornton's settlement applied to the soil areas of the recent measurement papers give a jumma in excess of that which has been fixed.

Application of Mr. Thornton's dry rates to soil areas.

The old *dry* rates of the former settlement applied to the meesan, rosli, dakur and bhoor of the present measurements would give an assessment of Rs. 57,788-4-3 instead of the present jumma of Rs. 55,951. In other words, the dry rates, which formed the basis of an assessment, "the lightness and general accuracy of which" has been allowed by Mr. Grant (page 153, printed report), give a revenue higher by nearly Rs. 2,000 than that which has been fixed after more than 25,000 acres or about 27 per cent. of the cultivated area have become irrigable.

But in Bhookurheree, as in Poor Chupar, the khusrahs are not altogether trustworthy in the classification of soils, and I think it safer to add to the 7,313 acres of recorded bhoor all the 2nd class rosli (amounting to 2,424 acres), which in the No. II Statement has been classed with rosli of the first class. In this way the bhoor is increased to 9,737 acres out of a total cultivated area of 44,212, giving a proportion of sand of about 21 per cent. on the cultivation.

To soil areas with an increased allowance of bhoor.

Mr. Thornton's *dry* rates applied to this area give assets amounting to Rs. 1,12,719-6-5, and an assessment of Rs. 56,360, slightly in excess of that fixed for the tract after it has become generally irrigated.

These calculations are, I think, of themselves almost sufficient to condemn the assessment, for Mr. Grant's assessment has been professedly based on that of Mr. Thornton, "whose estimates of produce," he writes, "though made 20 years ago, have been found to represent correctly the present yield of the soil." Mr. Grant held wrongly, as I have tried to show in my remarks on Poor Chupar, that prices had not risen; but he shows, page 149, that there had been a steady advance in rents, so that it cannot be said that Mr. Thornton's rates, "accurate and light," when the assessment was made, could be too high 20 years later, when there had been a marked rise in rents.

I have already shown how Mr. Thornton's dry rates condemn the present assessment, and I will now show to what a large increase rates, based on those of Mr. Thornton and applied to the present soil areas, point.

Application of wet and dry rates framed in the proportion laid down by Mr. Grant.

As has been already stated, there were at last settlement in the Bhookurheree upland only 189 acres of irrigation, and in the principal circle Bhookurheree, as in Poor Chupar, Mr. Thornton fixed no wet rates, while in the circle second in importance, that of Tissah, he fixed a wet rate for irrigated manured land alone; Mr. Grant, however, has calculated that the dry is to the wet rate as 5 to 7, and this proportion nearly accords with that shown by the old rates of the Nirganjnee Circle. The increase to the rental thus estimated, as the consequence of irrigation, is certainly very moderate, and the proportion is suited to the state of affairs in the time of Mr. Thornton, when, even where masonry wells existed, the expense of working them was very great, rather than to the circumstances of the pergunnah at the recent settlement, when canal water was irrigating nearly every estate in the upland. The small proportion of increase estimated however, and the source from which that proportion has been derived, preclude any doubt as to the addition for irrigation being too great.

The rates calculated in this way from Mr. Thornton's dry rates, and applied to the wet area of the settlement papers, give the following result:—

	Area in acres.	Rental in Rupees.
Wet	25,350	1,07,756 0 6
Dry	18,862	38,616 1 11
TOTAL ...	44,212	1,46,372 2 5

which would give an assessment at half assets of Rs. 73,186, instead of the present jumma of Rs. 55,951.

To take another calculation: if the addition of Rs. 3 per acre, which has been assumed by the Board of Revenue as the addition to the rental caused by canal irrigation, were made to the assets arrived at by the application of Mr. Thornton's dry rates, the result would be a rental for the Bhookurheree upland of Rs. 1,88,769 and an assessment of Rs. 94,384.

The result of adding the rate for irrigation assumed by the Board to the assets according to the dry rates.

This last estimate is probably higher than it would be safe to assume, but the increase implied is by no means extravagant. The 65 per cent. jumma at last settlement of Rs. 46,292 gives assets amounting to Rs. 71,218. To

Suitableness of last estimate considered.

this must be added the increase due to the "marked advance in rents," hardly less, it may safely be assumed, than the 12 per cent. necessary to bring the assets up to Rs. 80,000. Then there has been the addition of 9,360 acres to the cultivation. Much of this land is of excellent quality, worth certainly not less on an average than Rs. 2 per acre, or close upon Rs. 20,000, thus giving for the Bhookurheree upland a rough rental of Rs. 1,00,000, no attention having been paid to the enormous increase of irrigation to the much higher cultivation which now prevails, and to the greater proportion of the best kinds of soil.

The comparison between the assessment arrived at by applying Mr. Thornton's dry rates and that fixed at the recent settlement shows, I think, clearly enough that little or no attention has been paid to irrigation. Indeed there seems to be no other way of accounting for the extraordinary result. Mr. Thornton's assessment cannot be impugned, for it has been acknowledged to have been accurate and light, and it is frankly allowed in the printed report that the numerous transfers which have taken place are due not to any undue pressure of the jumma, but to the reckless extravagance of the Syud proprietors, who have now for the most part passed away, while the few survivors of the general wreck have learned a useful lesson from the unfortunate experience of their race, and are now sharing in the general prosperity of the pergunnah.

Conclusion from these calculations.

Nor can it be said that the area of the best soil is overstated. The meesan area indeed is only half as much again as the land under cane, cotton, and munji of a single year, and just two and a half times the annual average of land under cane and cotton. Bhoor, on the other hand, has received an addition of over 2,000 acres, and a still further increase might be made without materially affecting the calculation, which depends mainly for its force upon the great increase to the area under irrigation.

Possible objections to the general correctness of the soil area wet.

Appendix I, attached to this memorandum, will show the money rates which in this pergunnah were fixed immediately after the settlement, and those too which have been recently determined on application for commutation or in cases of enhancement.

Money rents fixed since settlement.

There are, it will be seen, but few rates; but in this pergunnah at settlement more than 32,000 acres out of an assessable area of 50,000 acres were registered as held—6,702 by proprietors and the rest by tenants with rights of occupancy. For the last named class, money rents were fixed here as elsewhere on the simple plan of making the rent-roll double the jumma. These rates are consequently but little help, and as nearly all the good land is held by proprietors and occupancy-tenants, the remaining portion of the pergunnah, paying chiefly in kind for the very poorest land, does not throw much light on the value of the average land in this tract.

I have, however, assumed for Bhookurheree the same as in Poor Chupar.

Rough estimate of assets and suitable jumma.

These are, it is believed, low for the pergunnah, and are abundantly substantiated by the rates in the adjoining pergunnahs of Poor Chupar, Mozuffernuggur and Jansut, the first slightly inferior to, the second better than, and the third about equal to, Bhookurheree.

These rates are annas 14 wet, annas 8 dry, and annas 4 bhoor per kutcha beegah. I have, however, reduced the irrigated area to 22,000 acres, or half as much again (the usual proportion) as the average of five years, excluding seasons of drought. The result is—

22,000	acres wet	at Rs.	5	4	0	... ...	Rs. 1,15,500
12,212	„ dry	„	3	0	0	... ...	„ 36,636
10,000	„ bhoor	„	1	8	0	... ...	„ 15,000
						TOTAL ...	Rs. 1,67,136

which, without taking into consideration the 7,000 acres of fallow, much of it being quickly broken up, would give a jumma of Rs. 83,000.

The pergunnah of Bhookurheree resembles Poor Chupar so closely both in respect of its natural capabilities, its artificial advantages, and the treatment which it has received, that I do not think it necessary to go so much into detail regarding this pergunnah as I did in my report regarding Poor Chupar. It may be well, however, that I should give a few examples of the manner in which the great change worked by the canal has been overlooked.

Particular instance of neglect of irrigation by Assessing Officer.

In Belrah, at last settlement, there were 880 acres of dry cultivation, now there are 978 acres cultivated, of which 947 are irrigated. The jumma has been raised from Rs. 1,663 to Rs. 1,950.

Belrah.

In Bhookurheree, at last settlement, the 3,148 acres of the cultivated area were dry; now, owing to injury to the important khadir land, the cultivation has been reduced to 3,142, of which 2,827 acres are irrigated. The jumma has been raised from Rs. 4,514 to Rs. 5,000. Even the nikassee of this estate has since settlement never been under Rs. 15,000; in good years the rent-roll rises to Rs. 17,500, and there is no doubt that a full rental would be nearly Rs. 20,000.

Bhookurheree.

In Bhopa there were at last settlement 1,132 acres of dry cultivation, now there are 1,420, of which 1,076 are irrigated, while there are 348 acres of excellent fallow, which is rapidly coming under the plough, and when cultivated will be irrigated. Yet the assessment has only risen from Rs. 2,214 to 2,660.

Bhopa.

In Yusufpore the cultivated area has increased from 437 acres to 633, and irrigation formerly unknown has now been extended to 519 acres, while only Rs. 117 have been added to the former jumma of Rs. 833.

Yusufpore.

It would be easy to multiply examples, but I shall conclude with the case of Gadlah. In this estate the cultivated area at last settlement amounted to only 1,159 acres, whereas it now amounts to 1,554, of which 777 are irrigated. The jumma has been raised from Rs. 1,914 to 2,130.

Gadlah.

Now, it happens that shortly after Mr. Thornton's settlement, a "dahar" or good land rate of annas 12 was fixed. This rate continued for many years, but when the canal was opened the landlord naturally enough reverted to crop and kind rents. At settlement kind rents were commuted into money rents on the same principle which guided commutation in other portions of the Ganges Canal tract, namely, that as the jumma was supposed to be a half asset one, it was necessary to make the rent-roll just about double the assessment.

In Gadlah, cultivation had greatly increased; and in order to keep the rent-roll down, it was actually necessary to fix the irrigated "dahar" rate at annas 10, or annas 2 less than the land paid when it was dry. An equally low rate was fixed in other first class villages, such as Tissah, Nirganjnee, Raepore, and others. But it is needless to show that but small weight was given to the all important point of irrigation; the fact is frankly acknowledged in the statement showing "the profits due to the canal," in which the sum of Rs. 4,933 is entered as the "portion of the increase (to the jumma) due to the canal."

Increase to asset due to canal, assumed by Assessing Officers.

In this way the increase to the assets caused by canal irrigation of 25,000 acres is estimated to be Rs. 10,000, or per acre of land irrigated annas 6-5, and per kutcha beegah just about 1 anna.

And it is to be remembered that there was no reason to expect an increase of irrigation from any other source, well-sinking was difficult and expensive, and, "owing to the great depth of the water, it was raised for irrigation at a great cost." Earthen wells are unknown, there are now as at last settlement seventeen masonry wells, wholly or partially used for irrigation, and there are now 164 acres watered from them instead of the old 189; the whole increase in irrigation, which has changed entirely the features of this tract, and has doubled its resources, is due solely to the canal, and the influence of this great work has been almost entirely overlooked.

I am aware that the arguments I have advanced are, for the most part, negative rather than positive, but I may fairly refer to the more perfect evidence which I have produced regarding the pergunnahs which surround Bhookurheree; those, namely, of Poor Chupar, Mozuffernuggur, and Jansut, all more or less similar in their past and present circumstances and in the treatment which they have received.

Concluding remarks.

In conclusion, it may not be out of place to state that it is evident from the remarks on the No. II Statements that the Commissioner had grave doubts as to the adequacy of the assessment of this tract. The jummas of 13 estates out of 60 were authoritatively pronounced to be too low, and the sufficiency of the assessment fixed for nine more was questioned. Of the first 22 on the list—and the first estates were evidently most carefully criticized—the assessment of eight estates was formally disapproved, and the suitableness of the jumma in four more was questioned. The unvarying reply to all remarks was, that the assessment would be reconsidered with reference to permanent settlement, but in only three cases of the 13 was this promise in any degree fulfilled, and Government is still losing not less than Rs. 30,000 per annum by an assessment which from the beginning has been pronounced to be inadequate.

APPENDIX I.

Showing rent rates fixed at Settlement by the Deputy Collector, and those fixed since in Court and by private agreement in Pergunnah Bhookurheree (rates are given per kutcha beegah = 1/8 of an acre).

No.	Name of Village.	By Deputy Collector at Settlement.			By Private Agreement.				Fixed in Court.			Remarks regarding rates fixed by private agreement and in Court.
		Wet.	Dry.	Bhoor.	All round.	Wet.	Dry.	Bhoor.	Wet.	Dry.	Bhoor.	
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
1	Athaisen ...	0 10 0	0 6 0	0 3 0	...	...	...	...	...	...	...	Rents were fixed for all occupancy-tenants at settlement, and only 32 acres are held by tenants-at-will, who pay crop and kind rents.
2	Alshabas ...	...	0 4 6	...	...	...	0 4 6	...	...	...	...	For 19 acres poor land adjoining ravines.
3	Berasadat ...	0 10 0 0 9 0	0 6 0 0 5 0	0 3 0 0 2 6	...	0 15 6	0 6 0	...	...	...	...	For 17 acres wet and 4 dry; the dry land is 2nd rosli.
4	Bera Tharoo ...	0 10 0 0 6 0	0 5 0	0 2 6	...	1 0 6	...	...	...	...	...	For a few fields a little over 4 acres.
5	Belrah ...	0 12 0	0 6 0	...	...	0 12 6	0 8 0	...	...	...	...	For 36 acres of the poorest land; 8-10ths of this estate are held by occupancy-tenants, and the greater part of the remainder by the proprietors.
6	Bhedheree ...	0 8 0	0 5 0	0 2 6								
7	Bhookurheree ...	0 12 0 0 11 0 0 10 0	0 6 0 0 6 0	0 4 0 0 3 0	...	1 6 0	...	...	1 0 0 by agreement in Court.	...	...	The Rs. 1-6 rate is for 35 acres, and Re. 1 for 10. Five-sixths of the estate, including most of the good land, are held by proprietors and occupancy-tenants.
8	Bhopa ...	0 11 0 0 7 0	0 6 0	0 3 0	...	0 15 0 0 11 0	0 8 0	...	1 0 0	0 8 0	...	For 90 acres by private agreement; the lower wet rate is for irrigated 2nd rosli.
9	Tima ...	0 11 0 0 10 0	0 7 0 0 6 0									
10	Teora ...	0 11 0	0 6 0	0 3 0		1 0 0	0 10 0	...	0 14 0	0 10 0	...	For 46 acres, rates fixed in Court in commutation on basis of nikassees.
11	Chooraiwala ...	0 8 6	0 4 6	0 3 0	0 10 0 0 5 0	...	...	...	...	...	...	For 562 acres, the higher rate is for "dahur," the lower for dandah, both irrespective of irrigation; distributed rates would be about 12 annas, 8 annas, and 5 annas.
12	Chuckrowlee ...	0 10 0	0 6 0	0 4 0								
13	Dhiraheree	0 8 0	0 6 0	0 2 0								
14	Raepore	0 10 0	...	...	...	0 12 6	0 8 0	...	...	...	...	For 115 acres.
15	Ruhmuthpore ...	0 12 0	0 6 0	...	...	1 0 6 1 1 0	...	...	...	...	...	For small patches for shikamees.
16	Rahekara	0 9 0	0 5 0	0 2 9	...	1 0 0	0 8 0	0 4 6	1 2 0	...	...	By private agreement for 644 acres.
17	Sookkar Tar											In commutation for small holding of Syud cultivator.
18	Sookkar Taree (uninhabited).	0 9 0	0 4 6	0 3 0								
19	Sekundurpore ...	0 12 0 0 11 0	0 7 0 0 6 0	...	...	1 8 0	...	...	...	...	...	For a few fields.
20	Sikree	...	...	...	...	...	...	...	...	...	...	The khusrah is so incorrect that it is impossible to distribute the rental of this estate; good land appears to be let at about Re. 1 per kutcha beegah.
21	Kazeepore	0 11 0	0 5 6	...	...	...	...	...	...	...	...	Irrigation is overstated, and bhoor is so much understated that light as the rates are, the cultivators broke down under them. Assuming the irrigable area to be held as much again as the average irrigation, the rates of the new lease would be annas 13 wet and annas 4 bhoor.
22	Karehra	0 8 0	0 5 0	0 3 0								
23	Kishanpore	...	...	...	0 8 0	...	...	...	...	...	...	Irrigation is greatly overstated, and it is impossible to distribute rates; really irrigated land lets at annas 12-6 and 13-6.
24	Kukrala											
25	Kukroulee	0 9 0	0 5 0	0 3 0	...	0 14 0	0 8 0	0 4 0	...	...	...	For 87 acres.
26	Khaieekheree ...	0 10 0										
27	Khoknee	0 10 0 0 9 0	0 6 0 0 5 0									
28	Gadla	0 10 0	0 7 0	0 3 0	0 10 0	...	...	...	...	...	...	The soil areas are so incorrect that it is impossible to distribute the rental. The old dry rate was annas 12.
29	Gadwara	0 12 0	0 7 0	...	...	1 8 0	...	...	...	...	...	For a few acres.
30	Muhmoodpore ...	0 10 0	0 6 0	...	...	0 14 0	...	...	...	...	...	For 57 acres.
31	Malpoora	0 10 0 0 9 0										
32	Morna	0 10 0 0 9 0	0 5 6 0 5 0	0 3 0 0 3 0	...	1 0 0	0 10 0	0 4 0	1 2 0 1 0 0	0 10 0	...	For 95 acres in enhancement suit.
33	Meemlakheree ...	0 13 0 0 11 0	0 7 0 0 6 0	0 4 0	...	0 9 0	...	...	...	...	...	For land brought under cultivation since settlement.
34	Nirganjnee	0 10 6	0 6 6	0 3 6								
35	Nulhera	0 11 0	0 7 0									

APPENDIX I—*continued.*

Number.	Name of Village.	By Deputy Collector at Settlement.				By Private Agreement.				Fixed in Court.				Remarks regarding rates fixed by private agreement and in Court.
		Wet.	Dry.	Bhoor.		Wet.	Dry.	All round.	Bhoor.	Wet.	Dry.	Bhoor.		
		Rs. A. P.	Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.		
36	Nulheree ...	0 8 0	0 6 0	0 2 0						...	...	...		For 30 acres.
37	Wuzeerabad ...	0 10 0	0 5 0	0 3 0		0 13 0	...	...	...	...	...	...		For 10 acres in commutation.
38	Yusufpore ...	{0 10 0 {0 7 0	0 6 0	0 3 0		...	...	...	...	...	...	...		
	BACKWARD ESTATES.													
1	Bhoopore ...	0 6 0	0 4 0	...		...	...	0 5 0	...	...	...	...		Cannot be distributed, as the area entered wet is three times as great as the irrigated area.
2	Birake ...	0 11 0	0 6 0	0 2 0		...	0 4 0	...	...	...	...	...		This estate is very exceptional. There is a want of cultivators, irrigation is enormously overstated, and the land is poor and adjoins the ravines.
3	Duryabad ...	0 6 0	0 4 0	...		...	...	...	...	0 7 0	0 4 0	...		The rates were fixed on the basis of the nikassees in commutation, which was applied for by the zemindars, who could not manage the Goojur cultivators.
4	Duryapore ...	0 5 0	0 4 0	0 4 0		...	...	...	...	...	...	...		For 250 acres.
5	Doulutpore (uninhabited)	...	...	...		0 9 0	0 6 6	...	0 4 4	...	...	...		For 155 acres, but irrigation is greatly overstated, and most of the so-called rosli is bhoor.
6	Enseolpore ...	...	...	...		0 10 0	0 6 6	...	0 4 0	...	...	...		
7	Shadan Bangur(Goojurs)	...	0 5 0	...		...	...	0 5 6	...	...	...	...		The area entered wet is 329 acres, and the greatest area irrigated in any two fusils is 16 acres, so that it is useless to try to distribute the rates.
8	Fitzepore ...	...	...	...		...	...	...	...	...	...	...		
9	Kiharpore (Goojurs) ...	0 6 6	0 4 0	0 3 0		...	...	0 5 6	...	0 8 0	0 5 0	0 3 0		These rates were fixed in a commutation case on the basis of the nikassees, greatly to the discontent of the zemindar, who will no doubt enhance.
10	Khasra (Goojurs) ...	...	...	...		...	...	...	...	0 10 0	0 6 0	0 2 6		Fixed on basis of nikassees for 223 acres.
11	Kasoolee (uninhabited)...	...	...	...		...	...	...	...	...	...	...		

Note by A. CADELL, ESQ., *Settlement Officer at Meerut, on the Assessment of the Ganges and Kalee Doab in Mozuffernuggur,—dated Meerut, the 12th December* 1869.

The pergunnah reports show in detail the objections which are made to the assessment of the upland portion of the tract lying between the Ganges and the Kalee Nuddee. It is the object of this summary to place shortly and clearly before the Board and Government the great change which, since the settlement of Mr. Thornton and Sir Henry Elliot, has taken place in the circumstances of this tract, and the failure of the assessing officers to secure to Government a proper share of the extraordinary increase in the assets caused by the opening of the Ganges Canal. The statement attached to this paper shows that, while, according to the records of the two settlements, cultivation had increased by 30,188 acres and irrigation by 97,951, the Government demand has been raised from Rs. 3,12,080 to Rs. 3,32,631. This increase, although inconsiderable, would, under ordinary circumstances, have been satisfactory, seeing that the Government share of the assets has been reduced from 65 to 50 per cent. A glance, however, at the various estimates of the value of this tract will show that, in the recent assessment, a very inadequate portion of the increased assets has been secured to Government.

The rates of the former settlement have been throughout acknowledged to have been moderate and fair, and, in order to show that little attention has been paid to the all important point of irrigation, I have, in the pergunnah reports, applied to the present soil areas the dry rent rates of Mr. Thornton's settlement, and in Bhooma Sumbulhera, those fixed by Sir Henry Elliot. These dry rates point to assets, independent of all irrigation, whether from wells, tanks, or the canal, of Rs. 5,53,742. But since 1841 prices have been steadily advancing; rents, as Mr. Grant himself allowed, have risen in a marked manner, and an addition of 10 per cent. for the rise in prices and the progress of 20 years must be looked upon as a very moderate one. This allowance would bring the assets at dry rates up to a sum of Rs. 6,09,116; to this must be added, taking the Board's addition for irrigation, Rs. 3 per acre for the 20,415 acres irrigated at last settlement, and we have a total rental of Rs. 6,70,361, more than equal to that assumed by the present assessment. In other words, the increase to the irrigated area of close upon 100,000 acres has been entirely overlooked; the Government demand has been fixed independent of canal assets, and if we again take the Board's rate of Rs. 3 as the addition to the rental due to irrigation, an annual revenue of Rs. 1,50,000 has been sacrificed.

The grounds on which this estimate has been based are necessarily very general, but the real foundation of the estimate are the rates fixed by Mr. Thornton, which were allowed by the assessing officers to be accurate and fair; the rate assumed for the irrigated area is that of the Board of Revenue, and may, with confidence, be accepted in the tract in which of all others canal irrigation was most urgently required.

But this professedly rough estimate is supported by the rates found to exist in the various pergunnahs, and every month is strengthening the conclusion to which these rates have pointed. In the various pergunnah reports rates have been assumed and have been substantiated by more or less full information stated in the appendices. The result of these rates for the whole tract is a rental of Rs. 9,26,573 and an assessment of Rs. 4,63,286, which is Rs. 1,30,656 in excess of that fixed.

It is, however, obvious from the existing rent-rates that the rates assumed have been extremely moderate, and that those of Khutowlee, Jansut, and Bhookurheree are unnecessarily low, and there can be little doubt that a moderately assessed rental would be little if at all short of Rs. 10,00,000. And it is to be remarked that when any doubt existed as to the general correctness of the soil entries of the khusrahs, large deductions have been made from the irrigated area, and large areas added to the bhoor of the settlement records, while, on the other hand, there has been no change in those pergunnahs in which, as the canal records show, irrigation had been obviously understated, and considerable tracts have been wrongly entered bhoor.

Finally, it may not be out of place to observe that higher rates than those assumed are general throughout the less favoured tract to the west of the Kalee Nuddee, and that the rent-rates assumed at settlement were lowest precisely in those pergunnahs in which irrigation was most easy and the most valuable crops were most largely grown.

Should Government decide that an annual loss of about Rs. 1,50,000 is too great a one to be allowed to continue, it would, I think, be necessary that a revision of the khusrahs and khuteonees should precede and accompany the revision of the assessment. In Poor Chupar the soil entries were never tested by the Deputy Collector, who was suddenly removed to the western portion of the district; and in Bhookurheree, the khusrahs are almost equally untrustworthy. In the other pergunnahs of the tract, it would be desirable to revise the soil entries, although errors are neither so general nor so glaring. Of the maps and khewuts only trifling correction would be required.

West of the Kalee Nuddee the assessment is in general moderate, and here and there extremely low; the comparatively few instances of wholly inadequate assessment will be pointed out when the pergunnahs west of the Kalee are reported upon, but no general objections are made to the assessment of that tract. Unfortunately, however, a stipulation has been entered in a large number of the administration papers to the effect that the rents recorded may not be raised during the period of settlement, and this condition acquires additional importance from the probability that in some estates at least the present assessment will be made permanent.

The inspection of the district with reference to permanent settlement is now at an end; the only work which remains is the settlement of the khadir lands, settlement cases, and the submission of reports regarding permanent settlement, the drawing up of which has been somewhat delayed by the excessive unhealthiness of the district during the past few months.

An assessment of Rs. 5,00,000 in the Ganges and Kalee Doab upland would fall as follows:—

	Ganges Canal Tract under report.	Kandhla, Mr. Colvin's assessment.	Shamlee, Mr. Colvin's assessment.	Boorhanah, Mr. Keene's assessment.	Shikarpore, Mr. Keene's assessment.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
On Malgoozaree	1 12 8	1 15 9	2 4 6½	1 10 8¾	1 14 4¼
On Cultivation	2 1 0	2 3 5	2 10 3⅜	1 15 8	2 2 1¼

In Shikarpore adjoining this tract and the pergunnah in which the rates are most nearly the same, the proportion of irrigation to cultivation is 56 per cent., in the Ganges and Kalee Doab, it is according to the settlement papers 49, while in Boorhanah it is 52.

The jummas of the past and present settlements and those roughly estimated are as follows:—

Name of Pergunnah.	Jumma at last Settlement.	Present. Settlement.	Roughly estimated assessment.	Remarks.
	Rs.	Rs.	Rs.	
Poor Chupar	57,027	59,330	79,155	These figures have reference to the upland portions alone of each pergunnah.
Bhookurheree	48,198	55,951	83,000	
Mozuffernuggur	48,384	56,822	77,872	
Jansut	56,152	58,578	87,246	To the wet land of Khutowlee Pergunnah, a rent rate of Rs. 6-12 per acre has been applied; the former rate of Rs. 6 being lower than the existing rent rates warrant.
Khutowlee	65,913	66,311	93,304	
Bhooma Sambulhera ...	36,406	35,719	49,598	
Total ...	3,12,080	3,32,711	4,70,175	

Statement showing the increase to cultivation and irrigation, and the present and former revenue of the upland of the Ganges and Kalee Doab.

Name of Pergunnah.	Wet land.	Dry land.	Bhoor.	Total cultivation.	Old fallow.	New fallow.	Total assessable.	Assets according to Mr. Thornton's dry rates on present soil area.	Assets implied by present Jumma.	Former Jumma.	Present Jumma.	Remarks.
Poor Chupar	*53	7,521	7,471	*37,122	4,886	1,758	46,715	1,09,776	1,18,500	57,027	59,330	The figures marked* show the cultivated area irrigated according to the papers of the old settlement.
Bhookurheree	*189	10,236	8,376	*44,212	4,429	2,440	51,081	1,12,719	1,11,902	48,198	55,951	
Mozuffernuggur	*2,495	8,590	5,149	*32,471	2,933	4,312	41,178	84,027	1,13,644	48,384	56,822	
Jansut	*5,406	16,496	13,745	*40,983	3,178	3,659	54,600	97,605	1,17,156	56,152	58,578	
Khutowlee	*11,292	14,441	6,037	*39,372	4,895	1,625	46,884	82,571	1,32,622	65,913	66,311	
Bhooma Sumbulhera ...	*970	13,096	13,060	*27,448	2,412	2,892	39,575	67,044	71,438	36,406	35,719	
	8,125			34,271								
Total at former Settlement ...	*20,405	70,430	53,628	*2,12,226	22,733	15,686	2,80,033	5,53,742	6,66,262	3,12,080	3,32,711	
Ditto at present ditto	1,18,356		Increase of cultivation.	2,42,414								
Increase of irrigation ...	97,951	.....	.....	30,188	.....	... ..	... ...	.....	... ..	Increase.	20,631	

Note.—In Pergunnahs Poor Chupar and Bhookurheree, in which the bhoor area is palpably understated, 2nd rosli to the extent of 3,552 and 1,692 acres respectively has been classed with bhoor.

A. CADELL,
Settlement Officer.

Note on the Mozuffernuggur Settlement.

Poor Chupar.
Bhookurheree.
Mozuffernuggur.
Jansut.
Khutowlee.
Bhooma Sumbulhera.

In my note, dated 19th May 1869, on the Mozuffernuggur Settlement, I showed that there was reason to believe that the rates used for assessment by Messrs. Martin and Grant in the six pergunnahs, named in the margin, were much too low.

The reports on these pergunnahs now submitted by Mr. Cadell show that this supposition was correct, and that the assessments made from 1860-63 failed to secure to Government its fair share of the profits of the landholders arising from increase of cultivation and irrigation since Mr. Thornton's settlement, and further that the classification of soils, and the entries of irrigated and unirrigated areas in the khusrahs, are mostly incorrect.

It follows that the settlement proposed by Messrs. Martin and Grant was bad at the time it was made, and should not have been passed then. I would therefore condemn it now.

I would announce that the settlement of these pergunnahs expires next July, and would treat them as a district coming under revision of settlement.

The shujrahs appear to be pretty correct; it will therefore be unnecessary to go to the expense of re-measurement, but fresh khusrahs and khuteonees must be drawn out.

The revised assessment should be based on present rentals and should terminate with the settlement of the rest of the district.

The settlement records of the remaining pergunnahs of the district, prepared by Messrs. Colvin and Keene, appear to have been carefully and correctly drawn out; and the assessments proposed by them represent the full share belonging to Government of the assets as they then existed. In some cases, for special reasons recorded by the assessing officer, the assessments were pitched below the full standard; the reasons given for this course in each case appear to me valid, and I would not alter the jummas then given out.

I would confirm the settlement of these pergunnahs, and direct Mr. Cadell to submit as early as possible his report showing the estates in them entitled to permanent assessment under the rules now in force.

The administration papers for the whole district drawn up in 1859-64 contain stipulations regarding rent, which are illegal. They should therefore be cancelled, and fresh papers drawn up for every village in accordance with the instructions laid down in Circular No. 24 of 1868.

The 10th March 1870. J. INGLIS.

Note by H. S. REID, Esq., *dated 12th March* 1870.

* Former jummas.

† Revised jumma.

1. A jumma of Rs. 3,12,080* at 66 per cent. of the rental assets represents a rental of Rs. 4,68,120.

2. A jumma of Rs. 3,32,431† at 50 per cent., a rental of Rs. 6,64,862.

3. That is, if the former assessment (made by one of the ablest Settlement Officers of the day, Mr. Edward Thornton) was correct, and the revised assessment is not too *high*, the rental assets of the six pergunnahs of the Ganges and Kalee Doab have increased 42 per cent., or by Rs. 1,96,742.

‡ Increased cultivation in acres.

§ Increase in rental.

4. Assuming 2 Rupees per acre as a fair average rate for cultivated land (‡30,188 × 2 =) Rs. 60,376, deducted from Rs. 1,96,742§ (=1,36,366) gives the increased rental due to rise in rents, irrigation, and other causes.

5. I am unable to reconcile these results based on Mr. Cadell's own figures with the conclusion at which Mr. Cadell has arrived.

6. The revised Government demand, notwithstanding the reduction of its proportion to the rental represented by 100 from 66 to 50 (*i. e.*, from ⅔ to ½) is 3·3 per cent. in excess of the former assessment.

7. It appears to me that Mr. Cadell has not attempted to ascertain the actual rentals (the true *nikassee*) of the year in which the Government demand was determined. His conclusions are based on theoretical grounds.

8. I have not the leisure to go carefully through Mr. Cadell's figures, nor have I by me Messrs. Martin's, Grant's, and Colvin's reports.

9. My colleague proposes that Government should announce that the settlement of these six pergunnahs will expire next July; that they should then be treated as a district coming under revision of settlement; that fresh khusrahs and khuteonees should be drawn out, and that the assessment should be based on present rentals.

10. I doubt whether it would be fair to the zemindars to assess on present rentals. Rents have doubtless (as we have seen was the case in the district of Boolundshuhur) risen very considerably since Messrs. Martin's and Grant's assessments were made. It must be remembered that Act X, 1859, which by systematizing enhancements of rent has exercised so great an influence in raising rents, was hardly in operation before the Mozuffernuggur settlement was commenced, and that while the settlement was pending, zemindars were unwilling to enhance rents.

11. On the other hand, it may not be easy to ascertain at the present day what the rental assets of these six pergunnahs were when the Government demand was determined. But the efforts should be made if a revision of Mr. Martin's and Mr. Grant's assessments is to be carried out.

12. I should like to see how the rates fall on the Government demand in Seharunpore on the soils, irrigated and unirrigated, of the several qualities corresponding exactly probably with those prevailing in Mozuffernuggur. It is not fair to the Settlement Officer who assessed these six pergunnahs to compare their rates with those fixed at a later date in a much richer district (Meerut).

13. Three rupees per acre *all round* appears to me to be too high a rate at which to calculate the difference between the rent of irrigated and that of unirrigated lands. It is certainly higher than the result at which Mr. C. A. Elliott arrived in the Furruckabad District.

At a Conference held by His Honor the Lieutenant-Governor, Messrs. Forbes and Cadell represented the conclusions they had arrived at after enquiries made by them, as directed by the Lieutenant-Governor's minute, dated from Allahabad, the 28th May 1868. These, as I remember them, were as follows :—

1. That the assessments made by Messrs. Colvin, Grant, and Keene in the pergunnahs west of the Kalee should be left undisturbed, and be reported for sanction. They noted that the assessments were in some exceptional cases very light and inadequate, but in many of these had been purposely determined at low figures, *e. g.*, in confiscated estates, and in certain townships held by large influential Syud and Moghul families.

2. That throughout this tract, there was but a small area in which the several conditions, required for permanent settlement, had been fulfilled. But if the assessments made were to be maintained as proposed, the question as to the estates to which the settlement should be permanently or only temporarily sanctioned would be subject of report, and in this report the villages underassessed would be specified.

3. That in the six pergunnahs of the Ganges and Kalee Doab, noted in the margin, although the revenue had been raised from Rs. 2,81,660 (the jumma of Mr. Thornton's settlement) to Rs. 3,32,431, this increase failed to secure to Government any share of the large increase in the assets caused by the opening of the Ganges Canal. Mr. Cadell submitted a note,

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and a statement showing the increase to cultivation and to irrigation, and presenting data as follows:—

	Acres.
Increase in cultivated area	30,188
„ irrigated area	97,951

Application of Mr. Thornton's dry rates of rent, with an addition of only 10 per cent. for the rise in prices of produce and improved rentals, gave a total rent-roll of Rs. 6,09,116, to which must be added Rs. 3 per acre of 20,415 acres irrigated at the time of Thornton's settlement, making a grand total rent-roll of Rs. 6,70,361, a sum more than equal to, *i. e.*, higher than that assumed by the present (Martin's) assessment. But the increased area of irrigation created by the canal, and amounting to nearly 100,000 acres, have not been calculated. Taking the Board's rate at Rs. 3 per acre, an asset is found of three lakhs of rupees, and the settlement, as proposed, involves a loss of 1½ lakhs of revenue.

Besides this glaring and serious omission, Mr. Cadell represented that the rates assumed in Pergunnahs Khutowlee, Jansut, and Bhookurheree are unnecessarily low, and that a moderately assessed rental would be little, if at all, short of Rs. 10,00,000.

That when any doubt existed as to the general correctness of the soil entries of the khusrahs, large deductions had been made from the irrigated area, and large additions made to the bhoor. While again there has been no change in those pergunnahs in which, as shown by the canal records, irrigation has been obviously understated.

In other words, the khusrah specifications of soils and of irrigated lands are generally wrong.

Further, that in pergunnahs west of the Kalee Nuddee, and which are less favored, the rates assumed are higher than in the six pergunnahs of this Doab, and these assumed rates are "lowest precisely in those pergunnahs in which irrigation was most easy and the most valuable crops were most largely grown."

For these reasons, Messrs. Forbes and Cadell recommended that the settlement proposed should not be accepted. That revision of assessment, preceded and accompanied by a revision of khusrahs and khuteonees, should be made throughout the tract.

I understood that both these recommendations of the Settlement Officers,—*viz.*, (1) that the assessments made in pergunnahs west of the Kalee should be approved and report confined to the question of permanent or temporary settlement; (2) that the settlement of the Kalee and Ganges Doab tract (the khadir lands not included) should be revised *de novo*,—were accepted by His Honor, and that on receipt of official reports, official instructions would be issued.

Understanding that my opinion is asked on the proposals of the Settlement Officers, I record it decidedly in favor of them in both respects. I consider a settlement proposed to the proprietors should not be lightly set aside, and, therefore, I think the *assessments* made in the larger tract west of the Kalee should be accepted, notwithstanding inequalities. The principles of calculation of assets or revenue may not have been the best or such as to ensure full accuracy. But there have been no extensive or glaring omissions or errors of calculation, and where inequalities of assessment have been large, and in favor of the proprietors, they have been made so with a purpose and design, which, though sufficient to forbid a permanent settlement, are not in my idea reason for refusing sanction to a temporary one.

But in the Kalee and Ganges Doab, the assessments have been made on assumptions of soils irrigated and unirrigated areas, which are so utterly wrong and erroneous that a thorough revision *de novo* appears to me not only justifiable, but unavoidable. I do not think the Government at all bound to sanction, even temporarily, a revenue assessment, in calculating which the Settlement Officer omitted or forgot to consider the demand justly demandable on an area of 100,000

acres, brought under irrigation by a large and costly work like the Ganges Canal. I think this omission alone to be sufficient for condemnation, and when to this is added the fact that the kushrah entries are universally wrong and full of errors in important particulars, I think there is full ground for determining that the revision of settlement shall be made *de novo*, shall extend to revision of field survey and measurement records, and not be limited only to fresh calculation of revenue assessments.

If it is determined to accept the proposals made, I would suggest the issue of orders with as little delay as possible. I think it will be beneficial to put as early an end as possible to the uncertainty created by a doubt as to whether settlement is to be confirmed or no; and I would suggest that Mr. Cadell be instructed to report the estates west of the Kalee, to which the conditions of permanent settlement have been completely fulfilled, and, having done this, then proceed to take up revision in the Kalee and Ganges Doab.

M. H. COURT.

Resolution—By the Government of the North-Western Provinces, in the Revenue Department,—No. 118*B*, *dated Camp Burrapoora, the 25th March* 1870.

Read again—

Minute by His Honor the Lieutenant-Governor, dated the 26th May 1868.

Read also—

Reports by Mr. Cadell on the six pergunnahs of Mozuffernuggur, constituting the eastern portion of the district.

Minutes by Messrs. Inglis and Court.

OBSERVATIONS.—In conformity with the instructions conveyed in the minute above quoted, Mr. Cadell has been employed in reviewing the assessments of the eastern half of the district, settled by Messrs. Martin and Grant, and he has submitted reports on the six pergunnahs noted in the margin. He has also summed up his conclusions in a separate note, dated 12th December last.

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2. The conclusions arrived at by Mr. Cadell were discussed at a conference held at Meerut, where Mr. Inglis, Senior Member, Sudder Board of Revenue, Messrs. F. Williams, C. S. I., and M. H. Court, C. S. I., the retiring and incoming Commissioners, Mr. W. A. Forbes, C. B., and Mr. Cadell, were present.

3. The opinion of all present was unanimous that the assessment on these six pergunnahs is inadequate, and that the inadequacy existed at the time when the assessment was framed; that consequently there should be a revision of the Government demand, preceded by a testing and correction of the entries of soil and irrigation.

4. In this opinion the Lieutenant-Governor concurs.

5. The detailed pergunnah reports show that the rates used by Mr. E. Thornton, the fairness of which is universally admitted, if applied to the increased area of cultivation (with some addition for advance in prices, and a suitable sum for the superior value of the area irrigated at the time of Mr. Thornton's settlement) would produce assets equal to the demand now assessed. But in the meanwhile, the face of the country has been changed by the Ganges Canal, so that the irrigated area has increased from 20,405 acres to 118,356, that is, by nearly 98,000 acres. The great enhancement in value created by this irrigation has thus been virtually left out of account.

6. The same conclusion is borne out by a comparison of the rates of the assessment in these pergunnahs with those settled by Messrs. Keene and A. Colvin, as detailed in the appendix to Mr. Cadell's note.

7. Mr. Cadell calculates the loss of revenue at about a lakh and a half of rupees on an assessment of about 3½ lakhs. Indeed, if the assessment were now

raised to five lakhs, the rates, it is shown, should nearly assimilate with those of the other pergunnahs just alluded to.

8. Mr. Cadell has supported his conclusions in every pergunnah, by illustrations of specific estates in which the actual assets are disproportionately in excess of the revenue assessed upon them.

9. The evidence from these statements appears to the Lieutenant-Governor to prove conclusively that the assessment was originally inadequate and should now be disallowed.

10. Intimation should accordingly be given, now that the existing assessment of the six pergunnahs in question will not be sanctioned beyond the present revenue year, and that a revision will take place to take effect as soon after as possible.

The new assessments will be based on existing assets, and will run, as proposed by Mr. Inglis, for the same period as the present settlement, so as to expire at the same time with it.

11. In order that the basis for this assessment may be as complete and accurate as possible, the khusrahs, which are believed to be correct as regards area, but to a considerable extent incorrect as regards soils and irrigation, should be subjected to a careful revision.

12. As regards the remainder of the district, the reports of Mr. Cadell will be awaited.

13. The Lieutenant-Governor desires to place on record his sense of the zeal, ability, and judgment with which Mr. Cadell has conducted a delicate and difficult operation, and requests that his acknowledgments on this account be communicated to that officer, as well as to Mr. Forbes, for the aid and advice he has afforded to Mr. Cadell in accomplishing the task. His Honor has full confidence in committing to Mr. Cadell the completion of the work.

14. The settlement papers of the district must also be revised, as in Boolundshuhur, eliminating the objectionable stipulation as to limitation of rents.

ORDERS.—Ordered, that copies of the above Resolution be forwarded to the Board of Revenue, North-Western Provinces, the Commissioner of Meerut, the Collector of Mozuffernuggur, the Settlement Officer of Mozuffernuggur, for information and guidance, and to Mr. W. A. Forbes for information, with the remark that a printed copy of the papers on which the Resolution has been recorded will be furnished hereafter.

C. A. ELLIOTT,

Offg. Secy. to Govt., N.-W. Provinces.

No. 276, dated 26th May, 1871.

From—E. C. BAYLEY, Esq., C. S. I., Secretary to the Govt. of India, Home Dept.,
To—The Secretary to the Government, North-Western Provinces.

I am directed to reply to your letters, noted in the margin, regarding the settlements of the District of Boolundshuhur and of Pergunnah Baghput, in the District of Meerut. The Governor General in Council regrets that it has been impossible to dispose of these cases at an earlier date. They involve questions of much difficulty, and of the highest importance. They re-open, among other matters, the whole question of the permanent settlement in the North-Western Provinces, and they bring under consideration some of the essential principles on which the assessment of the land revenue in Northern India is conducted.

No. 280, dated 20th February 1869.
„ 1232, „ 8th June 1869.
„ 63A, „ 12th January 1870.
„ 113B, „ 23rd March 1870.
„ 1670A, „ 10th December 1870.

2. It appears that the revision of settlement in the District of Boolundshuhur was commenced in 1858, on the assumption that it was to be made, in the ordinary way, for a term of years, and it was carried on continuously until 1864.

In that year, in consequence of the discussions regarding the proposed introduction of a permanent settlement into the North-Western Provinces, a revision of previous operations was ordered, and in 1868 a further revision was commenced, in order to bring the settlement into conformity with the orders contained in the Secretary of State's despatch of the 23rd March 1867.

Not long afterwards, the Lieutenant-Governor found reason to doubt whether the assessment proposed for the district was not altogether insufficient in amount, and he ordered Mr. Daniell, the Collector, to make a general inquiry into the subject.

The result is shown in these papers. Mr. Daniell believes that two-thirds of the estates in the district are assessed far below the recognized rate under which the Government is entitled to 50 per cent. of the net assets. The Government demand, under the old settlement, was £105,683. Under the new settlement it is £123,353.

Mr. Daniell is of opinion that, if the 50 per cent. rule were now applied, the Government demand would be £141,353; in other words, that the State is losing £18,000 a year, and is taking only about 35 per cent. of the net assets instead of the 50 per cent. to which it is entitled. These conclusions are, in all essential respects, adopted by the Board of Revenue and by the Lieutenant-Governor. "It may be assumed," Sir W. Muir writes in his minute, dated 14th December 1869, paragraph 16, "that if a settlement were now to be made in reference to present rentals, and the evidence now available as to assets, there would, in all probability, be an increase of about a lakh and three-quarters of rupees, more or less, *i. e.*, about 14 per cent. on the revised jumma."

The Lieutenant-Governor is, nevertheless, of opinion that the settlement should be confirmed. He states that he seens no reason to doubt that "the assessments were framed adequately, under the recognized principles of settlement, at the time when they were determined," and that the disproportion between the present assets and the Government demand is mainly due to the great and sudden rise in rents which has taken place since the assessment was fixed.

8. With regard to the causes which have led to this rise in rents, Mr. Daniell says that it "is not attributable to the increase of cultivation or irrigation; but, apart from any visible improvement, assets have increased to a great and certain extent" (report, paragraph 50). "The fact remains that at the time of settlement the rent-rolls were ascertained and believed to be 24·6 lakhs, and five years later they are estimated to be 28·2 lakhs" (paragraph 59). "The increase in income is not the result of local improvement. * * There is nothing whatever to show in any part of the district that any expenditure has been made to any appreciable extent either by landlords or tenants" (paragraph 73). "The determination of the Government demand is the one chief cause of rise, especially in villages which are free from any number of right-of-occupancy tenants, who may have hitherto been accustomed to hold at rather low rates. The fact of the Government demand having been fixed undoubtedly brought the land almost at once to its proper value. In other cases the value of the land has, I think, risen from the increased value of produce, and, in special circumstances, from the increased prosperity of any class of cultivators" (paragraph 76). Another cause is pointed out by the Lieutenant-Governor in paragraphs 18 and 19 of his minute, dated 14th December 1869. He says—"It must not be lost sight of that the general prevalence of rents in kind, at customary shares by division or valuation, has had a tendency to stereotype rates, and to prevent the rise of money rents; and this was no doubt a potent cause of long depression of the rates of rent which prevailed in this district, notwithstanding its populousness, prosperity, and situation in the high lines of commerce. Moreover, as pointed out by Mr. Currie, the conversion of rents in kind into money rents*, an operation largely carried out by that officer, was a matter of great difficulty, especially in tracts where no money standard existed. The operation was generally managed by consent of parties, and the cul-

* The original says—"conversion of money rents into rents in kind,"—but this is obviously an accidental transposition of the words, and the passage has been corrected accordingly.

tivator had to be conciliated as well as the proprietors. The standard assumed was probably even at the time low; and, with the increasing tendency of rent to rise, it is not to be wondered that proprietors have since been able to raise the rents settled by Mr. Currie."

4. This increase of rents having taken place since the assessment was fixed, the Lieutenant-Governor considers that the Government is bound to accept and ratify the settlement for the remainder of the term of 30 years for which it was originally made. This term expires in 1888-89, or in about eighteen years from the present time.

5. The question at issue is not, however, confined to the expediency of confirming this settlement for a term of years. *The greater part of the* Boolundshuhur District is declared to fulfil the conditions which, under the last orders of the Secretary of State, would authorize a permanent settlement to be made.

The Lieutenant-Governor naturally shrinks from the conclusion that the assessment which has been proposed in this district could properly be declared to be permanent, believing, as he does, the fact to be established that the total rental has increased during the last five years, since the assessment was made, by about 28 per cent., and that the increase is still rapidly going on. Under these circumstances, in presence of the obvious truth that a permanent settlement would involve an enormous sacrifice of future revenue, the Lieutenant-Governor comes to the conclusion that "the lesson may fairly be learned from the history of this settlement, that the two conditions enjoined by Her Majesty's Government for a permanent settlement are not sufficient." The whole question of permanent settlement in the North-Western Provinces is thus necessarily re-opened. In regard to that question generally, the views of the Governor General in Council will be stated further on. In regard to the question, as it affects Boolundshuhur in particular, it is sufficient for the present to say that His Excellency in Council fully concurs in the Lieutenant-Governor's conclusions that the assessments which have been made in that district cannot be made permanent, and that they cannot in any way form the basis of a permanent settlement. The practical question *now is, whether* the settlement is to be confirmed, as the Lieutenant-Governor has recommended, for the remainder of the term of 30 years, which will expire in 1888-89.

6. Much as the Governor General in Council regrets the serious sacrifice of revenue which such a course involves, he cannot avoid the conclusion that the Lieutenant-Governor's proposal ought to be adopted. His Honor has satisfied himself not only by written reports, but by his own personal enquiries in the Boolundshuhur District, that there "seems no reason to doubt that the assessments were framed adequately, under the recognized principles of settlement, at the time when they were determined, and provisional arrangements entered into with the proprietors. The disproportion (he says) of the present assets is due, as set forth in my former minute, to the great and sudden rise in rents. Therefore, under the principles there explained, I am of opinion that the Government is bound to accept and satisfy the settlement."

Assuming the accuracy of the facts stated in the papers now before the Government, His Excellency in Council can come to no other conclusion. That the amount of the revenue is so small is a consequence of the system of settlement followed generally in the North-Western Provinces; it is not the result of specially faulty proceedings in this particular district. Owing to the rise in rents, the increase in the prices of agricultural produce, the extension of irrigation, the construction of railways, and other similar causes, the country is now in a transition state; and if a new settlement were now to be made, and we were to fix the assessment at a sum fully equal to half the existing rental, we should probably, as His Honor observes, find "in a few years that what has occurred would be again repeated."

Nor can the other reasons assigned by the Lieutenant Governor for confirming this settlement be overlooked, for they are of very serious importance. Settlement proceedings have, he says, "been now in operation, more or less, for ten years in this district. The uncertainty consequent on this state of things cannot but have kept people's minds in a most unsettled state, and prevented their devoting themselves, in the certainty of reaping the results, to the improvement of their lands by the investment of labor and capital. Any revision of settlement which would prolong this harassing condition is much to be deprecated. It is most desirable that this long period of excitement and doubt should be brought to a close, and energy and application of capital and labor again fostered by the confirmation of the settlement."

Whether the conditions under which settlements are now being made for a term of thirty years in the North-Western Provinces, give sufficient security for maintaining the just rights of the State, and for preventing the sacrifice of any portion of that share of the rental of the land which the State is entitled to receive, is a general question of a very serious character. It can hardly be denied that such instances as the present throw grave doubt upon the sufficiency of the existing system. It is clear that in Boolundshuhur the State is obtaining only about 35 per cent. of the rental of the land, instead of 50 per cent. which is now considered its equitable share, or instead of 66 per cent. which was the share taken by the Government when the former settlements for thirty years were made. As regards this particular district, I am to state that, while the Governor General in Council accepts the Lieutenant Governor's conclusion that the confirmation of the settlement is necessary, he does so with extreme reluctance, and only because he feels that the loss of revenue is, in this case, a less serious evil than that which would follow from the long delay which would attend any attempt to revise the principles on which the settlement has been made. It cannot be forgotten that sacrifices of the just rights of the State, such as those which have occurred in the present instance, not only confer no real benefit upon the country, but lead inevitably to the imposition of burdens, which, under a better system, would be unnecessary, upon other classes of the community.

8. It is desirable to notice here that the papers referring to the settlement of the Mozuffurnuggur District, which have been received from the Government of the North-Western Provinces, exhibit still more unsatisfactory results, although of a somewhat different character. It appears that the settlement of Mozuffurnuggur was commenced in 1860, and that operations have been going on ever since. A special enquiry, undertaken in six pergunnahs, with the object of testing the results of the settlement, has satisfied the Lieutenant Governor that the Government demand, which had been fixed at £33,000, ought to have been at least £48,000, so that there is a loss of revenue, in this portion of the district, of £15,000 a year, and the Government share of the assets is only about 32 per cent.

The Lieutenant Governor has refused to confirm this settlement (Resolution, Government, North-Western Provinces, dated 25th March 1870), on the ground that the assessment was originally inadequate, and never represented anything like the share of the assets of the land, which the Government, under the existing rules of settlement, was entitled to receive.

9. In acceding to the Lieutenant Governor's proposition that the settlement of Boolundshuhur should be confirmed, the Governor General in Council is of opinion that an important reservation is necessary.

It appears from Mr. Daniell's report that, when the assessments were made in this district, the old system was still in force, under which separate engagements were taken on account of the cesses for roads and other local purposes. Although these cesses were payable with the Government demand, and recoverable as arrears of land revenue, they were specified separately. This system was changed, under orders issued with the sanction of the Government of the North-Western Provinces, by the Board of Revenue on the 13th June 1866. It was

then declared that "the extra cesses for road, school, and dâk fund, and for the payment of chowkeedars which have hitherto been demanded, will cease to form the subject of separate engagements, and, so far as the landholders are concerned, their liabilities will be limited to the consolidated demand, which will be rated at 55 per cent. of the net assets of their estates. The Government demand from the land will hereafter be fixed at 55 per cent. of the average net assets, and engagements will be taken for this amount only." Of this 55 per cent., 50 per cent. represents the Government revenue, and the remaining 5 per cent. is distributed among local cesses as follows:—

	Percent. on net assets.	Percent. on Government revenue.
	Rs. A. P.	Rs. A. P.
Road Cess...	0 8 0	1 0 0
School	0 8 0	1 0 0
District Post	0 2 0	0 4 0
Municipal	3 14 0	7 12 0
TOTAL ...	5 0 0	10 0 0

10. It appears from several paragraphs in Mr. Daniell's report* and from the last paragraph of the Lieutenant Governor's minute, dated 19th March 1870, that the Lieutenant Governor proposes to introduce into the Bolundshuhur District this system of including all cesses with the Government revenue, and of taking a single engagement for the whole amount at the rate of 55 per cent. of the rental. This involves an addition to the total former demand of Rs. 3-14 per cent. on the rental, the so-called municipal cess for village police not having been imposed in this district when the revenue assessments were originally made. He proposes, further, to add a stipulation, in confirming the settlement, to the effect that the road cess of one per cent. will be subject to be doubled. The Governor General in Council regrets that he is unable to approve these proposals.

* Paragraphs 8, 65, 71, 72, and 100.

11. The views of the Governor General in Council in regard to the nature of the cess imposed for local purposes were stated as follows in the circular of the Home Department, dated 21st February 1870 :—

Para. 6.—There has been at various times considerable misunderstanding regarding the true character of the road cess, and of the other cesses which are levied for local purposes in Northern India. In consequence of the fact that it has been found convenient to collect them with the instalments of the land revenue, and that the rate at which they are to be levied has usually been fixed when the settlement of the land revenue is made, they have not unfrequently been looked upon as constituting virtually a portion of the land revenue set aside for local purposes. But it has been distinctly declared by the Government of India on more than one occasion that they are nothing of the kind. While the land revenue represents that portion of the rental of the land which the State, as the principal and acknowledged proprietor of the land, is entitled to receive, the district road cess and the other cesses are taxes imposed on the agricultural classes for certain local purposes from which those classes directly benefit. There is no necessary connection between these cesses and the settlement of the land revenue; and the circumstance that their amount has usually been fixed as a percentage on the land revenue is due merely to the fact that the land revenue is assumed to represent a certain definite proportion of the gross rental of the land. In the North-Western and other Provinces, where, under existing rules, the State receives one-half of the gross rental, it is convenient, when we desire to impose a tax upon the annual value of the land, to say that it shall be levied as a percentage on the land revenue.

12. The Secretary of State, in his despatch, dated the 12th May 1870, on the subject of local cessess in Bengal, has expressed views in exact accordance with those of the Government of India; and his remarks are so important, and they appear to His Excellency in Council so completely to dispose of the question now at issue, that it is desirable to quote them here.

Para. 12.—It has been contended that the rates levied in other Provinces of India are essentially distinct in principle from the rates which it is proposed to levy in Bengal. The argument appears to be that, in other Provinces of India, the local rates are simply so much addition to the ordinary land revenue—an addition which is there legitimate, because the Government had, not in those Provinces, debarred itself by positive engagements from increasing the land assessments. This appears to be only another form of stating the argument already dealt with, which is founded on the terms of the permanent settlement. But the distinction thus drawn between the character of such rates, when levied in Bengal, and the character of similar rates when levied elsewhere, is a distinction which I concur with your Excellency in considering to be unsound. Whatever character may be assigned to these rates as a matter of mere verbal definition, they were unquestionably intended by the Government, in all the Provinces in which they have been raised, to be in addition to the land revenue, and not a part of it. This separation was expressly defined and marked in the proceedings of the Government of Bombay before any special legislation had been passed upon the matter. In the resolution of that Government, dated 9th March 1860, the Superintendents of Survey were directed, 'after fixing the assessment of a district,' to add the rate 'over, after, and above the amount which, on other considerations, they may deem appropriate.' Although incorporated with the land revenue in respect to the mode of levy, as being the most convenient, it is again in the same sentence explained to be 'calculated over and above the ordinary assessment;' and Sir Charles Wood, in his despatch of 25th May 1861, in which he dealt with the proposal, speaks of it as a proposal 'for the imposition of a school rate and road cess in addition to the revised rates of land assessment which have been, and still are, in course of introduction.'

13. Her Majesty's Government are, therefore, of opinion that it cannot be said with justice that to impose rates in Bengal would be to impose a special tax on that Province which is not imposed on other parts of India.

14. It is true that, in making some of the more recent land settlements in various Provinces of India, the Government has given notice that, in fixing the assessment of land revenue for 20 or 30 years, it retained the power of imposing some additional rates for local expenditure. In the Bombay Act of 1865,* a notice to this effect has been made permanent by law. But this notice, so far from indicating that such rates are to be considered as part of the land revenue, is, on the contrary, a distinct indication that they are to be considered separate. The notice was issued, because the Government was warned by the misunderstanding which had arisen in Bengal, and, because, it knew that precisely the same misunderstanding might arise under any settlement—the misunderstanding, namely, that during the term for which such settlement might be made, the Government absolutely surrendered all power of additional taxation upon the land. But, although, under these circumstances, it was expedient to prevent such misunderstanding in future by a warning explanation to all with whom new settlements might be made, Her Majesty's Government do not admit that, where no such notice has been given, no rates can be levied in addition to the assessment. This, indeed, would involve a result in direct antagonism with the principle laid down in this despatch, and sanctioned in the case of the income tax. That principle is, that any extra taxation or rating levied from the agricultural classes over and above the land revenue must be imposed as equally as possible upon all holders of property accessible to the impost. But if those holders of landed property are to be free from the tax to whom notice was not given at the time of settlement, the rates cannot be imposed equally, but, on the contrary, there must be an extensive system of exemptions. And those exemptions must especially include the holders of inams of alienated villages and all permanent tenures either rent-free or at small fixed quit-rents. The guarantee under which these persons hold their lands, free from any increase of the land assessment, is a guarantee quite as binding as the promise given to any holder in Bengal. But the practical injustice of exempting inamdars, or the owners of alienated villages, is as apparent as the departure it involves from the principle of making rates equal and general in their incidence. It must always be remembered, in matters of taxation, that when a given work is to be done, and a given amount of expenditure is required to do it, the exemption of any class is simply an aggravation of the burden on all other classes who are not exempt. And in this case those would be the exempted classes who have been otherwise most favoured by the State, and those would be the classes bearing an aggravated burden who already contribute most to the public expenditure. Moreover, the holders of property thus exempted would derive equal, or, indeed, greater benefit from the rates than the holders of property who alone would be called upon to pay them. On these grounds, Her Majesty's Government feel that, in rejecting any claim to exemption from rates on the part of those who did not expect to pay them at the time of the land settlements, or on the part of those who hold under permanent tenures, whether of one kind or another, they are not adopting any mere verbal plea in order to justify a foregone conclusion, which otherwise might be difficult of defence. They are satisfied, on the contrary, that they are rejecting a claim founded solely

* Act I of 1865, Section XXIX, clause 1.

on a mistaken interpretation of the mere wording of a particular document, and which, if admitted, would lead to results at once anomalous and unjust.

It is the more important that a final decision of this matter should be arrived at, because it must be admitted that the misunderstanding on which such claims to exemption are founded is a misunderstanding which has been long prevalent, and has imparted a character of doubt and hesitation to the language and to the acts of the Government, both in India and at Home. There has been, on the one hand, a feeling and a conviction of the essential distinction between the ordinary land revenue and the rates which it was desired to levy, whilst, on the other hand, there has been a difficulty in defining that distinction, and a fear lest it should be found to be incapable of explanation to the people. Hence there has been a variety of suggestions for evading the difficulty by raising the required amount of money through a house tax or a license tax, or some other tax which could not be confounded with the land revenue, and respecting which, therefore, there could be no doubt of the right of the Government to impose it. But all these suggestions have, for various sufficient reasons, been rejected. The despatch of Sir J. Lawrence of 22nd February 1867 (No. 9, Revenue Department), exhibits the embarrassment felt by the Government of India in this condition of affairs, and its anxiety lest rates on landed property should appear to the people to be a breach of faith. It is injurious alike to the Government and to the people that this condition of things should continue. The Government has nothing to conceal, and the people have nothing to fear or lose in the reaffirmation of the same principle as regards rating, which has already been affirmed as regards the income tax.

16. An important step in the practical decision of this question has been taken in the passing of the Bombay Act No. III of 1869. The special object of that Act is to raise 'funds for expenditure on objects of local public utility and improvement,' and for this purpose it imposes rates upon all holders of land without making any distinction between those who received and those who did not receive a notice at the time of settlement. No exemption of any class of landholder is admitted. On the contrary, the holders of rent-free of alienated villages, and of other permanent tenures, are expressly subjected to the rates.

17. In view, therefore, of these various facts and considerations, Her Majesty's Government have now to intimate to your Excellency the conclusion to which they have come, after a careful consideration of a controversy which has now been going on for a long course of years. This conclusion is, that rating for local expenditure is to be regarded, as it has hitherto been regarded in all the Provinces of the Empire, as taxation separate and distinct from the ordinary land revenue; that the levying of such rates upon the holders of land, irrespective of the amount of their land assessment, involves no breach of faith on the part of the Government, whether as regards holders of permanent or of temporary tenures; and that where such rates are levied at all, they ought, as far as may be possible, to be levied equally, without distinction and without exemption, upon all the holders of property accessible to the rate.

18. The Governor General in Council is of opinion that the conclusions thus declared by the Secretary of State cannot be too carefully and strictly enforced. In almost every Province difficulties have arisen in consequence of these local rates having been treated as a portion of the land revenue, and doubts have frequently been expressed whether they can be altered during the currency of a settlement, without breach of faith on the part of Government. Thus in the reply, dated 17th March 1870, to the circular of the Home Department quoted above, the opinions of the Lieutenant Governor of the North-Western Provinces were stated as follows:—

A compact has been made to take so much as revenue and so much as cesses, and the plain inference is that the demand in respect of both is limited by the engagement. With the sanction of the Supreme Government, the land revenue has been consolidated with the cesses, and the demand for the aggregate is engaged for in one sum, which the proprietor is told, combines his liablities both for land revenue and cesses. Under these circumstances, to increase the cesses during the currency of an engagement duly concluded and ratified by the Government, would be viewed by those concerned, and, in the Lieutenant Governor's opinion, would, in effect, be a breach of engagement."

In your letter No. 121A to the Financial Department, dated the 27th January 1871, the views of the Lieutenant Governor on this subject have also been stated very clearly:—

"The correct principle," it is said, "as it appears to the Lieutenant Governor, is that which is followed in these Provinces, viz. to assign a fixed portion of the land revenue for local objects. This is now done always at the time of settlement, by setting apart one-eleventh of the entire demand, or one-tenth of the imperial land revenue for purposes of Revenue, Police, District Roads, District Dâk, Village Education, and Sanitation,—duties

the discharge of which is to a large extent obligatory on Government as the superior landlord of the country."

14. In regard to past settlements in the North-Western Provinces, the Governor General in Council does not wish to dispute the Lieutenant Governor's conclusion that no alteration should be made in the amount of the local cesses. As the term of nearly all those settlements has already expired, the question is one of little practical importance. But in the opinion of His Excellency in Council it would be very unwise deliberately to allow fresh settlements of the land revenue to be made, in such a manner as to expose the Government to a repetition of charges of breach of faith, if, at any future time, during the currency of the settlement, it should become necessary to increase the rates levied for local purposes upon the land.

15. The Governor General in Council much regrets that the views of His Honor the Lieutenant Governor on this subject should differ from those which have long been maintained by the Government of India, and which have been so strongly affirmed by the Secretary of State. But His Excellency in Council thinks it essential that the system now followed in the North-Western Provinces, in regard to these cesses, should be altered, since it must, in his opinion, have a strong tendency to encourge and perpetuate the misunderstaudings which have led to so much embarrassment in the past, and which it is important to guard against in the future. It must, he considers, be made clear that the rates levied for local purposes are taxes altogether distinct in their nature from the land revenue, and there is, as it appears to His Excellency in Council, no more propriety in taking engagements for their payment than there would be for the payment of taxes of any other kind.

The Governor General in Council is fully alive to the importance of altering, as seldom as possible, the amount of any rates that may be imposed upon the land, and nothing could be further from his wishes than the adoption of a system under which their amount would be frequently changed. He thinks it extremely probable that it may, as a general rule, be inexpedient and unnecessary to alter the rates during the currency of a settlement, and he admits that there may, under ordinary circumstances, be much administrative convenience in revising, at one and the same time, the revenue demand and the local rates. The rates would thus usually come under revision when a new revenue settlement is made. In regard to the general principle that there should be as little uncertainty as possible as to the amount of the demands upon the land, there can be no difference of opinion.

16. It is stated in your letter No. 100B, dated 17th March 1870, that—

None of the new settlements in course of formation have as yet been confirmed by Government. In a considerable number of districts, the engagements have been taken from the proprietors at the new jummas on the rule indicated above.* The Lieutenant Governor agrees with Mr. H. S. Reid, that it is open to the Government to add to the road cess at any period prior to final confirmation; and it had been His Honor's intention, in sanctioning any settlement, to have reserved the power of raising the road cess to two per cent. on the jumma, some previous notice, as suggested by Mr. Inglis, being given before the enforcement of such additional demand. And if the Governor General in Council desires it, this view can be acted upon, and in all new settlements the road cess could be, *ab initio*, rated at the above sum. The Lieutenant Governor would not go higher than that rate, agreeing with the Board that the special burdens upon the landed interest are sufficiently high.

* that is, that a single engagement shall be taken for the land revenue and cesses, without dintinguishing them separately,

It thus appears that although, in certain districts, engagements have been taken from the proprietors under the 55 per cent. rule, which consolidates the cesses with the land revenue, it is open to the Government to revise this arrangement at any time prior to final confirmation of the settlement. The Lieu enant Governor has further shown that he is prepared to act upon this opinion by the orders which he has given in the case of the Boolundshuhur settlement, under which the settlement engagements taken from the proprietors will be revised, and

a new cess of Rs. 3-14 per cent. will be imposed over and above the assessment originally made.

17. I am therefore directed to request that in all future settlements, the system of taking engagements from the proprietors for the payment of local cesses as a part of the land revenue may be abandoned. In cases in which the settlements have already made much progress, but have not received the final confirmation of the Government, and in which it may be difficult, without serious inconvenience, to alter the wording of the engagements which have been taken from the proprietors, such confirmation should only be given on the distinctly expressed condition that nothing in those engagements will prevent the imposition of any rates for local purposes which the legislature may think fit to order during the currency of the settlement. The present instructions are, I am to add, in complete accordance with Act XVIII of 1871 (the North-Western Provinces Local Rates Act, 1871), which sanctions the imposition of rates on land for local purposes, "independently of, and in addition to, any land revenue assessed on the estate," and fixes no period of time within which the rates are to remain unaltered.

18. The serious questions which have been raised by the Lieutenant Governor in regard to the settlement of the North-Western Provinces must now be noticed.

19. In the greater part of the Boolundshuhur District the conditions are declared to be fulfilled, which, under the existing orders of the Secretary of State, entitled the proprietors of land to a permanent settlement of their revenue.

Those conditions are thus laid down in Sir Stafford Northcote's despatch of the 23rd March 1867:—

1*st*, no estate shall be permanently settled in which the actual cultivation amounts to less than 80 per cent. of the cultivable or malgoozaree area; and

2*nd*, no permanent settlement shall be concluded for any estate to which canal irrigation is, in the opinion of the Governor General in Council, likely to be extended within the next 20 years, and the existing assets of which would thereby be increased in the proportion of 20 per cent.

The Lieutenant Governor states that the district of Boolundshuhur "is so advanced in cultivation, and developed as to canal irrigation, that the greater part of the estates answer the first rule of having four-fifths of their area under cultivation, and also the second, of there being no prospect of improvement by canal irrigation over 20 per cent. of present income."

The facts which have led the Lieutenant Governor to the conclusion that the history of this settlement shows that "the two conditions enjoined by Her Majesty's Government for a permanent settlement are not sufficient," are of great importance. They serve also to illustrate causes which, under the existing system of settlement in the North-Western Provinces, may prevent the State from obtaining from the land the revenue to which it is theoretically entitled.

20. In the greater part of the North-Western Provinces, the rents, even of tenants-at-will, are regulated to a considerable extent by custom, and certain classes of cultivators possess rights of occupancy, secured to them by law, under which they are often entitled to hold at beneficial rates of rent. In the latter cases, the cultivator is virtually a co-proprietor in the land, and under the existing system of settlement, to whatever extent he receives a portion of the proprietary profits, to that extent he may intercept a portion of the assets to which the State is entitled. The settlement is made with the proprietor, on the assumption that he and the State are to share equally, and the tenant holding at beneficial rates is, in a great measure, left out of the account. Whenever, from any causes, the prevailing rates of rent are low, the interests of the State may suffer, although the total profits actually derived from the land may be large.

It is to causes of this nature that the inadequacy of the assessment of the Boolundshuhur District appears to be mainly due.

"Settlement Officers," the Lieutenant Governor says, under the system of property prevailing in Northern India, must frame their assessments on the prevailing standard of rent. * * It would be dangerous to allow the assessing officer to leave the hard ground of current standard rents, and speculating on an expected enhancement, to rate his assessments upon such expectation. There may, indeed, be cases (like that of Baghput in the District of Meerut, already submitted to the Supreme Government) where the rates over limited tracts are without any sufficient reason lower than in adjacent places; and there the settlement may safely be made on an anticipated rise, a proceeding justified by the consideration that the current rents are actually below prevailing rates. But where over a whole district, or large extent of country, certain rates prevail, these must be held the prevailing rates, and their result, the rental, or 'net assets' which form the basis of the Settlement Officer's assessment."

21. The case of the Baghput Pergunnah, in the Meerut District, to which Sir W. Muir refers, and regarding which a separate reference has been made to the Government of India, offers a remarkable illustration of the system upon which settlements are made in Northern India.

The settlement of Meerut was made by Mr. W. A. Forbes, one of the most distinguished revenue officers in the North-Western Provinces. After careful inquiry into all available facts, and comparison with the rates of assessment admitted to be very moderate under similar conditions in neighbouring pergunnahs or sub-divisions of the district, Mr. Forbes estimated that the proper revenue to be demanded for the Baghput Pergunnah, at the usual half asset rates, would be Rs. 2,45,922. The present assessment, made some 30 years ago, is Rs. 1,48,000.

The "actual condition," says Mr. Forbes, of this pergunnah, "as regards cultivation, irrigation, and development of qualities, has reached the highest standard." The population is said to be "active and energetic." Canal irrigation has been extended almost to the utmost possible limit. The Eastern Jumna Canal runs down the centre of the pergunnah throughout its entire length, and spreads its irrigation on either side up to the farthest point that the high levels just adverted to will admit. For richness of products, high farming, and general prosperous condition of the people, these inland estates are not to be surpassed."*

* Mr. Forbe's report, paragraph 4.

Since the former settlement was made, the cultivated area has increased from 73,506 to 98,369 acres, and the irrigated area from 12,623 to 59,064 acres. All the conditions laid down by the Secretary of State as necessary to justify a permanent settlement are declared by the Lieutenant Governor to be fully complied with.

When, however, Mr. Forbes came to re-distribute, village by village, upon individual estates, the Government demand, which according to his estimate ought to have been at least Rs. 2,45,922, he found it impossible to impose more than Rs. 2,10,035, and he states his conclusions as follows:—"I am positively certain that permanent assessment at that jumma will cause a loss to Government of Rs. 36,462." Mr. Forbes declares, and the Lieutenant Governor confirms the statement, that this result is owing to "the backward state in which rents are found." Notwithstanding the great improvement that has taken place in the value of land during the last thirty years, "the exceedingly light assessment at last settlement," the "enormous increase of assets due to the canal," the high prices of agricultural produce, and the immensely improved position and increased wealth of the cultivators, rents have hardly risen. "Whether," writes Mr. Forbes,† "there were difficulties which we know not of in the way of enhancing rents, or whether the people were ignorant of the procedure, is doubtful, but the fact remains. We do not find that rents have, as a rule, changed; no doubt they have risen, but how and when we cannot trace; and all over the country and especially in this pergunnah, we find the low rents of older days, when landlords were glad to entice in tenants at almost nominal rents in order to lighten their own burden."

† Paragraph 21.

22. In the case of the Baghput Pergunnah, Sir W. Muir has recommended, under certain conditions, that the settlement should be made permanent. He has,

however, in his subsequent minute on the settlement of Boolundshuhur, come to so decided a conclusion that the existing rules regarding permanent settlements must be revised, that the propositions regarding Baghput may, it is persumed, be considered in abeyance.

23. The Lieutenant Governor states his opinion that "the lesson may fairly be learned from the history of the settlement of Boolundshuhur that the two conditions enjoined by Her Majesty's Government for a permanent settlement are not sufficient." He says.—

that in this district those conditions have been fulfilled. The required limit of area under cultivation has been attained; the required extension of irrigation and development of resources fully secured. The 'existing assets,' if we look only to the produce of the soil, are in every way sufficient; but the 'existing assets.' which reach the proprietor in the shape of rent, are as yet inadequate, and when the assessment was made were still more so. 'It is evident,' the Lieutenant Governor continues, 'that the sacrifice to which Government, in conceding a permanent settlement, has consented, is one of future revenue from improvements accelerated by the increased investment of capital by proprietors when secure of the whole result. But in the case of a settlement like the present, based on an imperfectly developed rental, the sacrifice would be of future revenue erected by no such expenditure, but simply by the exertion of proprietary power in increasing the relative share of the produce which constitutes rent. This is a process which, in the nature of things, will come to pass equally whether the settlement be in perpetuity or for a term, and the sacrifice would be consequently gratuitous,—made without any corresponding object or return. I think, therefore, that a third condition for permanent settlement is thus shown to be quite necessary, namely, evidence that the standard of rent prevalent or the estimate of 'net produce' on which the assessments are based, is adequate; or (having due regard to soil, facilities of irrigation, and ratio of dry and wet land) is not below the level of rent throughout the country at large.'"

24. The conclusion of the Lieutenant Governor that the existing conditions for a permanent settlement are insufficient seem to the Governor General in Council to be indisputably correct. It seems, however, less clear that the third condition suggested by His Honor would supply the insufficiency of the present rules, and other questions of serious importance are involved.

25. The reasons which have been assigned by the Lieutenant Governor for the opinion, that the existing conditions for a permanent settlement are insufficient, seem also to apply, to a great extent, to the conditions under which settlements in the North-Western Provinces, are made for a term of thirty years. Wherever we find a state of things similar to that which prevails in Boolundshuhur and Baghput, the existing system of assessment, which is based not on the real assets, but on the rental of the land, must apparently entail loss upon the State. The land is fully cultivated and irrigated, and agricultural resources are highly developed, but a large proportion of the land is held by cultivators whose rents can only be enhanced, if at all, by process of law under certain conditions, or whose rents are limited by custom or other causes.

"The fact," writes the Lieutenant Governor in his minute of the 22nd December 1869, "is that the share of the cultivator, according to the usage of the district at the time of settlement was too large, and the share of the proprietor (*i. e.*, the rent) too low." * * * "There is reason to anticipate that in the course of a few years the upward movement of rent now begun will have extended over the whole district and completed itself; that is to say that proprietors emancipated from the conservative influence of rent in kind, will have pushed their standard of rent as high as the tenantry will bear it; and that future enhancement afterwards will depend mainly on improvement from expenditure of labor and capital, or rise in prices. The permanent settlement might then be introduced without any departure from the spirit in which it has been conceived and promised." * * * "The 'existing assets,' if we look only to the produce of the soil, are every way sufficient; but the 'existing assets' which reach the proprietor in the shape of rent are as yet inadequate, and, when the assessment was passed were still more so. The sacrifice of revenue under a permanent settlement would be gratuitous and indefensible, for the increase of income to the proprietor would not represent to the profit of capital invested on the faith of such settlement, but the mere assertion by the proprietor of a larger and more legitimate share in already existing assets."

26. It seems to be assumed, in the passages quoted from the Lieutenant Governor's minute, that the share of the actual cultivator in the assets derived from the land is now larger than it ought to be; that the share of the proprietor

is inadequate; and that until it becomes "larger and more legitimate," the Government cannot obtain the full amount of revenue to which it is supposed to be entitled.

It may be true that so far as the land revenue is concerned, the best thing which could happen for the Government under the existing system would be that the landlord should always obtain what His Honor has termed a fully developed rental. This, however, is a remedy which could hardly be fully applied unless it were admitted that it is desirable, in the interest of the State and of the public, that tenants should pay generally the highest possible rents; that the restrictions placed by law or custom on the power of a landlord to increase his rents should be done away with; and that rights of occupancy should cease. The Lieutenant Governor, whose views on these subjects are well known, would be the last person to approve of any such conclusions. The Governor General in Council would ask His Honor whether it does not follow that there is something essentially faulty in the existing system of assessment. It can hardly be right that the State should be unable to obtain its fair share of the assets of the land because tenants are well protected, or to say that for each rupee by which the existing revenue falls short of the amount to which the Government is entitled, we ought to force the actual cultivator, who may be a tenant with occupancy rights, to pay two rupees to the landlord.

27. The whole question of the permanent settlement of the North-Western Provinces having been re-opened, it becomes necessary to consider whether the experience which has been gained, since the orders of 1867 were passed, shows that the conditions then prescribed require amendment in any other respects than those which have now been noticed by the Lieutenant Governor. This question must, in the opinion of the Governor General in Council, be answered in the affirmative.

28. When the existing conditions for permanent settlement were prescribed, it appears to have been the intention of Her Majesty's Government to affirm two principles.

The first was, that the State ought not to demand a share of that increase in the profits of the land which is the result of the application of the capital and extertions of the occupant. Although this rule may have been imperfectly carried out in practice in the settlements made for a term of years in Northern India, the Government has long recognized the truth of the principle involved, and has declared that when a new assessment of the revenue is made, liberal consideration shall be given to the fact that improvements have been made by the expenditure of private capital upon the land. It is in accordance with this principle that it has been distinctly provided by law in the Bombay Presidency that when a revision of the Government assessment takes place, "such revised assessment shall be fixed, not with reference to improvements made by the owners or occupants from private capital and resources, during the currency of any settlement under this Act, but with reference to general considerations of the value of land, whether as to soil or situation, prices of produce, or facilities of communication,"—(Bombay Act I of 1865, Section 30).

The obligation thus put upon the Government is similar in principle to that which has long been applicable in the North-Western Provinces and in Bengal, in regard to the power of a landlord to increase the rents of a tenant with occupancy rights. Thus, it was laid down, when the settlements were made in the North-Western Provinces thirty years ago, that "it must always be remembered that when the improvement of the land is occasioned by the expenditure of capital by the cultivator, the proprietor will not be entitled to enhance the rent."* The same principle was subsequently affirmed by the law in Section 6 of Act X of 1859. The most important of the grounds on which the rent of an occupancy tenant may be enhanced is there declared to be "that the value of the produce or the productive powers of the land have been increased otherwise than by the agency or at the expense of the ryot." According to well-known decisions of the High Court

* Directions to Settlement Officers, paragraph 137.

of Calcutta, "if the rents of the neighbourhood have not adjusted themselves to the altered circumstances of the lands, the rent should be fixed according to the method of proportion, *i. e.*, the *increased* rent must bear to the *original* rent the same proportion that the *increased* value of the produce bears to the *original* value of the produce. The ryot should not be called on to pay to the landlord, under the name of rent, what is in fact not rent, but the produce of his own labor and capital sunk in the land."

29. The second principle which it was intended to affirm was this, that it was not right that the State should sacrifice that share of the increased profits of the land which would almost certainly, within a period which could be easily foreseen, result from the application to the land, not of the skill and capital of the occupant, but of the skill and capital of the State itself.

In the discussions which took place before the decision of 1867, this principle was generally admitted in regard to improvements arising from the extension of canal irrigation. It was agreed that the State could not rightly abandon the whole of the great increase of value which would be given to the land by the extension of works of irrigation carried out at the public expense, and the distinction was repeatedly drawn between improvement of this nature and that brought about by the expenditure of private capital. Thus, in the despatch of the Government of India, to the Secretary of State, dated the 20th November 1866, we find the following passages :—

It is with the express object of stimulating the investment of capital, and the application of skill and labor in landed improvement, that it has been proposed to make the assessment permanent. * * There is, however, a broad and clear distinction between improvements of the general character above adverted to and the improvement occasioned by canals. It is the object of the permanent settlement, in leaving the enhanced profit raised by the skill, exertion and capital of the occupant entirely in his hands, to create the most powerful incentive to the progress and prosperity of the country. But in the case of canal irrigation the benefit is created without any application of skill, exertion, or capital on the part of the occupant. The water is brought to his door ; the value of his fields is enhanced by virtue of the labor, skill, and capital of others. Improvement from canal irrigation is, therefore, entirely different from improvements made by the agricultural population. Of the former, 'the profits are in no sense, or in a very limited sense, the result of expenditure of capital by the proprietor. It is the capital of the community which has produced these results ; and the community at large, that is the State, is entitled to share in the profits.' Canal irrigation, then, is not one of the improvements which the permanent settlement is intended to create, and in so far the argument for a permanent limitation of assessment will not apply to enhanced profits expected from its extension.

In his minute dated the 14th December 1869, Sir W. Muir re-asserts what is in fact the same principle, although he does not specially refer to canal irrigation. He deprecates the permanent settlement of the Boolundshuhur District, because, from the causes which he has described, the increase in the rental of the land, which is rapidly going on, does not result from the expenditure of private capital, or from any improvements made by the proprietors, but from "a process which, in the nature of things, will come to pass equally whether the settlement be in perpetuity or for a term." He says that, under such circumstances, "the sacrifice of revenue under a permanent settlement would be gratuitous and indefensible."

31. The passages which have just been quoted are undeniably true, but it may be doubted whether the same distinction which was so justly drawn between the essentially different causes which may give increased value to the land should not be carried further, and whether any reasonable ground exists for treating the extension of canal irrigation as if it were the only means by which the value of the land may be increased without any expenditure of labor or capital on the part of the occupant. It is admitted that a permanent settlement ought not to be made when we know that the annual value of the land will, within a given period, be greatly increased by the extension of irrigation, in providing which the occupant of the land has borne no part. The grounds for refusing a permanent settlement (of the nature, that is which would be made under the existing system) do not appear to be less strong, when the increase in the value of the land is brought about not by the construction of canals, but by the construction of

railways, or other public works, or by other causes independent of the action of the occupant of the land. Great as the additional value given to the land by works of irrigation undoubtedly is, it is hardly greater or more certain than that which is given by railways and canals of navigation, and by the opening out of new and profitable markets. When the question of the permanent settlement was formerly under discussion, the magnitude of the economical revolution through which India is passing was less obvious than it is now. It may be doubted whether any parallel could be found, in any country in the world, to the changes which have taken place during the last ten or fifteen years in India ; to the diminution in the value of the precious metals, and the enormous increase in the prices of agricultural produce.

There could hardly be a better example of the manner in which the income derived from the land is, at the present time, increasing in the North-Western Provinces, than that which is afforded by the settlement of Boolundshuhur.

We are told by the Collector, after careful inquiry, that during the last five years, there has been in this district very little increase of cultivation, or of irrigation, and that "there is nothing whatever to show, in any part of the district, that any expenditure has been made to any appreciable extent either by landlords or tenants." Nevertheless, in these five years, the rental of the proprietors is declared to have risen by 28 per cent., and to be still rapidly increasing; and we are assured that if a new settlement were now made, upon the same basis as the last, the assessment would exceed that made five years ago by some £18,000, and would be raised from £123,000 to £141,000.

32. It is remarkable that during the long continued and voluminous discussions which have taken place, no such facts as those which the settlements of Boolundshuhur and Baghput have now brought to light appear to have been referred to. Yet these facts are now declared by Sir William Muir, who took so prominent a part in those discussions, and who is perhaps the highest living authority on the subject of the existing revenue system of the North-Western Provinces, to be fatal to the scheme of a permanent settlement in the shape in which it has received the sanction of Her Majesty's Government. We could hardly find a better example to show the imperfection of our present knowledge, or a better proof of the necessity of extreme caution, when we attempt to solve a problem of which the conditions are so complicated ; which depends so greatly on future circumstances which cannot now be foreseen ; and of which, if the solution be mistaken, the consequences may be ruinous. It is to be hoped that this will not be forgotten in the future consideration of this subject, and that all hasty conclusions will be avoided.

33. It has been suggested, at various times and by various authorities, that the settlement of the land revenue should be made, not upon the basis of a fixed money assessment, but on the basis of the value of a fixed quantity of produce, which value would be adjusted, from time to time, according to the average prices which prevailed.

It has been urged that a permanent settlement on this basis might be allowed without any serious sacrifice of future interest, and that the result would be in a great measure that which it has long been the desire of the Government to obtain,—a system under which improvements made at the expense of the occupant of the land should lead to no increase in the demands of the State, on account of its share of the produce ; while, on the other hand, the State would not lose the whole of the benefit derived by the land from improved administration, from the construction of great public works, and from the general progress of the country.

In paragraph 40 of his minute of the 22nd December 1869, the Lieutenant Governor has referred to this question ; and although he has not given any final opinion, it may be inferred that he decidedly inclines to the conclusion that the basis of a permanent settlement ought to be a grain and not a money assessment.

The Governor General in Council does not wish at present to give any opinion upon this subject, but it is one which is open to discussion.

34. I am directed to request that the Lieutenant Governor will now re-consider this great question of the permanent settlement of the North-Western Provinces. It will depend on the further inquiries and discussions which must be undertaken whether it will be found possible to maintain the conclusions formerly arrived at by Her Majesty's Government in favor of the principle of a permanent settlement. All that the Governor General in Council is at present able to affirm is this, that it has been proved by experience that the existing conditions regarding permanent settlements in the North-Western Provinces are insufficient, and that those conditions could not be applied without most serious and certain injury to the future interests of the public. The Governor General in Council will immediately place before the Secretary of State the facts which have now become apparent, and will propose that, pending the further discussion of the whole subject, the orders contained in Sir Stafford Northcote's despatch of the 23rd March 1867 shall be held in abeyance.

PERMANENT SETTLEMENT, PUNJAB.

No. 250—550, dated Lahore, the 13th August 1870.

From—T. H. THORNTON, Esq., D. C. L., Secretary to the Government of the Punjab,

To—The Offg. Secretary to the Government of India, Foreign Department.

With reference to your office despatch No. 382, dated 11th July 1865, and subsequent reminders, calling for an expression of the views of this Government on the subject of the application to the Punjab of the principles of the permanent settlement of land revenue as set forth in the despatch of the Right Hon'ble the Secretary of State for India, No. 11, dated 24th March 1865, I have now the honor, by direction of Sir Henry Durand, to transmit, for the consideration of the Supreme Government, copies of minutes on this important subject, recorded by the late Lieutenant Governor, Sir Donald McLeod, dated 2nd June 1870, and by Mr. R. E. Egerton, Financial Commissioner of the Punjab, dated 2nd August 1870.

2. The great delay which has taken place in replying to this reference is explained in the 1st paragraph of Sir Donald McLeod's minute as having resulted from non-receipt of a reply from Mr. E. Prinsep, Settlement Commissioner, to whom the papers were sent for an expression of his opinion. I regret to have to add that up to this date no reply has been received from Mr. Prinsep, though his attention was urgently called to the subject on the 4th of June; but His Honor deems it unadvisable to delay any longer the expression of his own views on the subject.

3. His Honor, I am desired to state, concurring generally in the views expressed and arguments used by Sir Donald McLeod and Mr. Egerton, is of opinion that any attempt at present to fix permanently the Government demand for land revenue in the Punjab would be, to say the least, altogether premature.

4. A glance at the agricultural statistics of the province generally will show that it is in a state of agricultural infancy. Out of an area of upwards of 100,000 square miles, only 31,513 square miles are cultivated, and out of the cultivated area only about one-fourth part is irrigated, though in the Punjab irrigation from wells or canals is almost universally necessary for the production of the more valuable crops, and in the south-western portions of the province is necessary for the production of even the ordinary cereals.

5. Turning from the general statistics of the province to an examination of the agricultural status of particular districts, there are doubtless villages and tracts in which the percentage of cultivation and density of population come up to the standard entitling them to permanent settlement under the Secretary of State's despatch; but, nevertheless, it may be confidently asserted that there are few, if any, in which the rent and resources are sufficiently developed to admit of their being permanently settled on their present assets without entailing a risk of great prospective loss to the State.

6. Let us take, for example, the recently-settled districts of Umritsur, Goordaspore, Sealkote, and Goozerat: these districts are among the most highly cultivated and densely populated of the province; yet the average incidence of the Government land revenue upon the cultivated and culturable area assessed falls at the rate of only 10 annas 4 pie to Rs. 1-5-7 per acre,—an amount far less than is realised in more advanced districts of India, and far less than may be reasonably hoped for hereafter.

7. Again, an examination of the agricultural statistics of the districts noted in the margin, which districts are perhaps the most favorably situated of any in the province for the development of their resources, being at once populous, flourishing, and highly capable of well or other artificial irrigation, exhibits the following results:—

Umritsur, Goordaspore, Sealkote, Jullundhur, Umballa, Goozerat, Loodiana.

DISTRICTS.	Population per square mile.	Cultivated area in acres.	Culturable area in acres.	Total area.	Area irrigated in acres.	Percentage of area irrigated to total culturable and cultivated area.
Umritsur ...	532	927,730	173,664	1,101,394	303,502	·27
Goordaspore ...	488	615,114	50,704	673,818	87,938	·13
Sealkote ...	512	825,874	131,022	956,896	402,508	·42
Jullundhur ...	586	657,094	78,763	735,857	200,097	·27
Umballa ...	394	945,526	283,989	1,229,515	131,682	·11
Goozerat ...	342	654,458	254,644	909,102	235,573	·26
Loodhiana ...	429	729,890	62,525	792,415	23,148	·3

8. In brief, it may be stated that in those districts of the province which may be considered as most ripe for the permanent settlement of land revenue, there is manifestly ample room for future developement of resources, either by expansion of cultivation, or extended use of irrigation, and production thereby of more valuable classes of crops.

9. But it is not only in the *quantity* and *class* of produce that improvement may be fairly looked,—there is also ample room for improvement in the *quality* of the more valuable staples. The cotton, the indigo, the tobacco, the saccharine produce of the Punjab are all, more or less, of inferior quality,—the result, it is believed, not of inferiority of soil, but of agricultural appliances, which defect, time, competition and contact with more advanced portions of the empire will gradually remove.

10. In addition, however, to the prospect of improvement in the quality of agricultural produce, there is every reason to hope for a great increase in the value of its produce from the opening out of new markets. Until lately the Punjab has been to a great extent a home-producing country, and it has been practically cut off by want of easy communication from the markets of the rest of India and from sea-board trade. Thus the average price of wheat in ordinary years is from 20 to 30 seers for Rupee,—a rate far below the rates obtaining in most other portions of India.

But a great change is in progress: the opening of the railway from Lahore to Calcutta and Bombay, the Suez Canal, the future opening of the new line from Mooltan to Kotri, will place the Punjab in easy communication with the markets not only of India, but of Europe, and will doubtless have the effect of raising the prices of its produce, and possibly lead to the development of new and important staples. Flax and hemp and other fibres of excellent quality are produced in the Punjab, and the growth of a trade with Europe in these commodities only waits the establishment of more speedy and certain communication: oil seeds are already exported to Marseilles, and there is every prospect of the trade increasing largely. Wool is at present produced almost entirely for home consumption only, but may soon become an article of export. Indigo of excellent quality can be produced, and only requires improved manufacture to rival that of

other parts of India. Our cotton is at present one of short staple and inferior quality, but in time may obtain a good place in the market at Bombay.

The above are only a few out of many agricultural products of the province which the expansion of commerce promises to increase in value and importance, while the large area of land yet uncultivated and the rapid increase of population promise to keep down the cost of production to a low figure.

11. Under the circumstances above set forth, His Honor cannot but consider that in a province just starting in a career of agricultural development, and which cannot be said as yet to have taken its proper position in the market with our more advanced provinces, and still less so in regard to sea-board trade, it would be the height of imprudence for the Government to pledge itself for a long term of years—much more for perpetuity—to a fixed monetary assessment of the Government share of the profits of cultivation.

Memorandum by SIR D. F. MCLEOD, *Lieutenant Governor of the Punjab.*

It will be seen that an expression of opinion on this very important subject of introducing generally or partially a permanent settlement into the Punjab has been called for, and the call reiterated by Government for years past. Mr. Prinsep was called upon to state whether he considered any, and what, portion of the districts settled by him fitted for the application to them of the principles of permanency under the rule laid down or suggested by the Secretary of State, that when three-fourths (I think) of the culturable area of a district or part of a district has been brought under cultivation, and there is no prospects of canal irrigation being introduced into such village, its assessment shall be declared permanent. Mr. Prinsep, in spite of numerous reminders, has not yet replied; and this is the cause why an answer has not yet been sent to the Supreme Government. Mr. Prinsep lately promised me that he would send in his reply immediately, but it has not come.

Although no longer entitled to record my opinion as Lieutenant Governor, yet, as the subject is one in which I have long taken a deep interest, and which is one of vast importance to the well-being of the province, I think it is right that I should leave my opinion on record in connexion with this reference still undisposed of.

I consider that it would be quite a suicidal act on the part of Government to declare permanent the *money* assessment of any lands whatever in this province, as was done by us in Bengal, at a time when we had but little information as to the true state of the case, and when opinions on the subject were crude and conflicting to a much greater degree probably than they are now. It is admitted that money is an altogether unreliable standard of value; and the great fall which has taken place in it during the last ten years should warn us what is likely to take place in the future.

I have myself little or no doubt that 50 years hence, if peace and prosperity continue, the purchasing of money will be less than half what it is now,—not in consequence of large importations of bullion or coin as some suppose (though this measure will necessarily be resorted to, from time to time, to restore equilibrium), but in consequence of the increasing producing power of the country, which I believe to be the sole measure of the relative value of money in different countries; and should it then prove the fact that the demand assessed upon land represents but half the real value it did when first fixed, we may, I think, feel assured, judging from past experience, that it will be a matter of the utmost difficulty to find other sources from whence the enormous deficits can be supplied, and the effort to realize it will be attended with exceeding danger.

If, however, in making our assessments, instead of using a cash standard we were to employ some other standard, supplying a more correct increase of value, I should be entirely in favor of permanency of settlement wherever cultivation shall have attained to the required proportions. The value of labor and

the price of corn are, I believe, accepted by political economists as the two most correct and permanent standards of value which are readily available; and of these, the cash is, in my opinion, the most convenient. If, then, after a money appointment has been fixed, its equivalent in corn collected at the average of (say) five years preceding were determined and recorded, on the understanding that it could be liable to revision at intervals of ten years, or twenty years, or such periods as might be preferred, according to the average price of corn during the years preceding the time of each revision, and such revised jumma were, on such occasion, substituted for that previously in force, the Government would be thus secured from the loss which would otherwise result from a fall in the value of money; while the agricultural population would be relieved, almost effectually as by a permanent assessment, from the annoyance and loss which inevitably result to them from the detailed enquiry now necessitated by each recurring revision of settlement.

From this principle of permanency, however, I would, for the present at least, exclude all that relates to irrigation, and would fix the permanent assessment at "bârâni" rates only, I believe the true theory of the irrigation demand in India to be, that Government is entitled to a seignorage on all water used for irrigation, wherever that water yields a value in excess of the profits of capital expended upon it, whether the water be taken from above the surface or below it. This theory applies alike, in my opinion, to irrigation from rivers, canals, reservoirs, or wells. It has been practically enforced in all ages in Eastern lands, and, unless it continue to be enforced for the future, not only will Government lose vast sums to which it is by immemorial usage entitled, but great relative injustice will be done to those now paying irrigated rates unless these be remitted,—a measure which would obviously involve enormous loss.

The ascertainment of the amount of this irrigation demand is fortunately not necessarily attended with the same minute and vexatious inquisition which is involved in the ascertainment of the ordinary assets of land. As regards rivers, canals, and reservoirs, it is now effected yearly by well-known processes, which processes will doubtless become simplified as our experience increases; and as regards wells, in all the settlements made by Mr. Prinsep, the assessable value of a well in each homogeneous circle has been recorded, and it is proposed that this lump sum be in future levied from each well in use, without any detailed reference to the area or the corps that may be irrigated from it in each year. All, then, that it will be necessary in order to determine the well irrigation demand will be to ascertain the number of wells in use in the village or other assessment circle—a matter which it will be at all times easy to ascertain with little or no chance of error.

The only further remark I have to make in connexion with the subject is, that the irrigation rates, of whatever kind, should undergo the same periodical revision, with reference to the average value of corn, as has been above suggested for the "bârâni" assessment, and as is still, I believe, the practice in Great Britain in relation to tithes.

Memorandum on the Permanent Settlement of the Punjab.

In a letter No. 282, dated 4th July 1865, from the Secretary to the Government of India, Foreign Department, the opinion of the Government of the Punjab was asked as to the applicability to the Punjab of the rules for the permanent settlement of land revenue in the North-West Provinces, laid down by the Secretary of State for India in his despatch No. 11, dated 24th March 1865; and in a subsequent despatch dated 23rd March 1867, it was stated that no permanent settlement was to be extended to villages to which canal irrigation was likely to be extended within the next 20 years.

2. The rule laid down is, that all estates in which the actual cultivation amounts to 80 per cent. of the culturable or malgoozaree area may, after revision, be admitted to a permanent settlement of the land revenue immediately. The

permanent assessment may be calculated at 60 or 66 per cent. of the existing assets. Other estates in which the cultivation is backward, and the future development of the resources uncertain, are to be settled for periods not exceeding 30 years; but periods of from 15 to 20 years are preferable.

3. I have had the advantage of seeing the memorandum on the subject of permanent settlement recorded by His Honor the late Lieutenant Governor of the Punjab, Sir Donald McLeod, dated 2nd June 1870, and I concur in all that is said in that paper regarding the inexpediency of introducing a permanent assessment of the land revenue in money.

4. The reasons which render it inexpedient to introduce a permanent settlement of land revenue in the Punjab, apart from the general question whether permanent money settlements should be made at all or not, are—

I.—The peculiarities of the country with reference to capabilities for irrigation and present distribution of population.

II.—The extreme fluctuations of the prices of agricultural produce.

III.—The absence of any desire on the part of the people for a permanent settlement.

I. With reference to the first reason, it is well known that the population of the Punjab is far more dense in the districts which adjoin the hills than in those tracts which are further away from the mountain ranges,—the reason for this being that the sub-montane tracts have a plentiful rainfall and good means of irrigation, by which they are rendered extremely fertile and able to produce a sure and abundant supply of food for the wants of their own inhabitants, and also for export to the less fertile districts.

But the soil of the districts which have a scanty rainfall and imperfect means of irrigation is excellent, and water only is required to make this soil as fertile as that of the sub-montane districts. There is little doubt that canals will before long be made to carry the water of the rivers into these tracts. The present population is far too small to cultivate the culturable area when canals shall have been made, and there can be no doubt that the densely populated districts will supply the hands necessary for the increased cultivation; but what will be the effect of this upon the villages which may have been permanently assessed in the sub-montane tracts? The probability is that the lands will be worse cultivated; that they will become impoverished; and that the assessment will break down. This objection may, perhaps, be considered speculative; but I submit that, if canals are made through the tracts which require irrigation, a cultivating population will be drawn to them from the more densely populated parts of the country and in far greater numbers than the natural increase of population can supply; and it is impossible to predict with certainty what the effect may be upon the districts whence the supply of cultivators is drawn, and where the permanently settled villages will be situated; and I think it inexpedient to make a permanent settlement with such an uncertainty impending.

II. With reference to the extreme fluctuations in the prices of agricultural produce, which have taken place within the last twelve years, I would remark that, if a permanent settlement were introduced under the conditions stated in the despatch of the Secretary of State, it would affect only a portion of the villages of a district, leaving a considerable number still under temporary assessment. It is almost impossible that the prices of agricultural produce should remain as they now are,—they must either rise or fall; in either case an inequality of assessment would arise hereafter. If prices fell considerably, it would be necessary to reduce the assessment of the villages permanently assessed; if prices rose, it would not be practicable to give Government the full benefit of the improvement in prices, as the assessment could not be raised much above the rates of the villages pemanently assessed. As, therefore, a permanent settlement could only be carried into effect partially in certain villages of each district, and as such a partial measure would operate unfavourably on future assessments, it is not advisable to introduce it at all.

III. There has been no desire expressed by the people for a permanent settlement. It is to be remembered that the Punjab landholders are for the most part cultivating proprietors, some with small holdings, quite unable from their habits, their education, and their antecedents, to understand the effect of a permanent settlement. They cannot realize a state of things which shall be quite permanent, and they do not plan far into futurity. I think, that, if they were offered the choice of a settlement for 30 years at half assessments, as under the present rule, or a permanent settlement at 20 or 25* per cent. higher, they would to a man refuse the permanent settlement.

* 60 or 66 per cent. of the assets, as proposed in the despatch of 1865.

5. There is a very general confidence in the moderation of Government; and the great increase of cultivation during the last 15 years under settlements made for short periods shows that temporary settlement does not deter the people from investing money in agricultural improvements. There are very few men of capital amongst the agriculturists, and the petty cultivating proprietors make such improvements as they can without fear of losing their money when revision of settlement takes place. A term of 30 years, too, enables a proprietor to make good profit upon the money invested in improving his land. In the Punjab Tenancy Act a lease for 20 years at fixed rent is held to bar all claim by a tenant for compensation for improvements, and by analogy a proprietor may be considered to have a sufficient inducement to invest money in agricultural improvements when he is assured that the Government demand will not be enhanced within that period.

6. If land in the Punjab were in the hands of large proprietors, who were deterred from investing their money in large schemes of agricultural improvement by the fear of enhanced assessment at frequently recurring intervals, and who, therefore, were eager for a permanent settlement, it would, perhaps, be advisable to make the assessment permanent, but taking the people as they are, it is not advisable, in the absence of any expressed desire on their part for a permanent assessment, and in the absence of any reason to believe that the progress of agricultural improvement is checked by the present system of temporary settlement, to urge upon them the acceptance of a permanent settlement.

7. If it be considered advisable to fix the maximum proportion of the rent which Government shall take in future, this may be done without binding Government to forego the increased value of that share which a permanent assessment in money involves. But I see no reason for such a measure; our assessments are not based with any great precision upon a calculation of the rental;—there are no data for such calculations, owing to the fact that the land is held chiefly by cultivating proprietors, and it appears to me worse than useless to restrict the action of the Government in future by a declaration which is not called for by any existing necessity.

8. It is not, therefore, in my opinion advisable either to make a permanent settlement in the Punjab, or to fix the maximum proportion of the rent which the Government may demand.

R. E. EGERTON,
Financial Commissioner, Punjab.

Dated 2nd August.

No. 7, dated Simla, the 26th May 1871.

From—The Government of India,
To—Her Majesty's Secretary of State for India.

We have the honor to forward, for your Grace's consideration, the accompanying papers bearing on the important question of the permanent settlement of the land revenue in the North-Western Provinces. Our despatch to the Government of those Provinces, No. 276, dated the 26th instant, will show to your Grace the reasons which have led us to concur with the Lieutenant Governor,

Sir William Muir, in the opinion that it has been clearly proved by experience, that the conditions which have been laid down regarding permanent settlements in the North-Western Provinces are insufficient, and that they could not be applied, in their present form, without leading to most serious and certain injury to the future interests of the public.

2. We have thought it necessary to request the Lieutenant Governor to re-consider the whole question; and, pending the result of further discussion, we hope that your Grace will agree with us in thinking that the orders contained in Sir Stafford Northcote's despatch No. 15 of the 23rd March 1867, should be held in abeyance. They have hitherto been in no instance acted upon, and the only cases in which it has been reported to us that their conditions have been fulfilled are those of the settlements of the District of Boolundshuhur, and of the Pergunnah of Baghput, in the District of Meerut, to which our letter of the 26th instant, to the Government of the North-Western Provinces, more particularly refers. The subject is one in which the proprietors of land in Northern India have hitherto taken little or no interest, and there can be no doubt that it is still open to Her Majesty's Government to modify the former orders in any manner which may be thought fit.

3. We forward for your Grace's information copies of minutes by His Excellency the Viceroy and by the Hon'ble Mr. Strachey. They refer more especially to the question of making a permanent settlement of the land revenue, not upon the basis of a fixed money-assessment, but on the basis of a fixed quantity of produce, the money value of which would be adjusted from time to time. We think it desirable to reserve any expression of the opinion of our Government upon this and the other important subjects left for discussion, until we are in possession of the views of the Lieutenant Governor and of the other experienced officers who will be consulted.

Papers to accompany Revenue Despatch from the Government of India, to Her Majesty's Secretary of State, No. 7, dated the 26th May 1871.

1. From North-Western Provinces, No. 280, dated 20th February 1869, and enclosures (*Revenue Proceedings, 2nd May* 1869, *Nos.* 3 *to* 5).
2. To ditto, No. 269, dated 17th May 1869 (*Revenue Proceedings, 22nd May* 1869, *No* 6).
3. From ditto, No. 1232, dated 8th June 1869, and enclosures (*Revenue Proceedings, 26th March* 1870, *No.* 3).
4. From ditto, No. 63A, dated 12th January 1870, and enclosures.
5. From ditto, No. 113B, dated 23rd March 1870, and enclosures.
6. From ditto, No. 1670A, dated 10th December 1870.
7. Minute by the Hon'ble J. Strachey, dated 26th September 1870, with appendix.
8. Minute by His Excellency the Governor General, dated 7th February 1871.
9. To North-Western Provinces, No. 276, dated 26th May 1871.

Also the following papers relating to the revision of the Mozuffernuggur Settlement referred to in paragraph 8 of the foregoing letter to the Government of the North-Western Provinces, No. 276, dated 26th May 1871.

1. Telegram to North-Western Provinces, dated 30th June 1870.
2. Ditto from ditto, dated 7th July 1870, and the following papers:—
3. Minute by the Lieutenant Governor, dated 26th May 1868.
4. Memorandum by Mr. W. A. Forbes, dated 21st May 1865.
5. Ditto by Mr. A. Cadell, dated 16th May 1868, with appendices.
6. Ditto by Mr. Charles Grant, dated 17th June 1868.
7. Ditto by Mr. S. N. Martin, dated 18th ditto.
8. Letter from Government, North-Western Provinces, to Officiating Secretary to Chief Commissioner, Central Provinces, No. 21A, dated 27th June 1868.
9. Letter from Government of North-Western Provinces, to Secretary to Board of Revenue, No. 22A, dated 27th June 1868.
10. Letter from Mr. Forbes, No. 36, dated 15th July 1869, to Commissioner, Meerut Division.
11. Letter from Mr. Cadell, to Superintendent of Settlement, Meerut and Mozuffernuggur, dated 16th February 1869, with appendices.

12. Report by Mr. Cadell, dated 15th October 1869, on the assessment of Bhooma Sumbulhera.
13. Ditto by ditto, dated 15th October 1869, on Pergunnah Mozuffernuggur.
14. Ditto by ditto, dated 13th October 1869, on the assessment of the Bhookurheree upland.
15. Note by ditto, dated 12th December 1869, on the assessment of the Ganges and Kalee Doab, in Mozuffernuggur.
16. Ditto by Mr. J. Inglis, dated 10th March 1870, on the Mozuffernuggur Settlement.
17. Ditto by Mr. H. S. Reid, dated 12th March 1870.
18. Ditto by Mr. M. H. Court (no date).
19. Resolution of Government, North-Western Provinces, No. 118B, dated 25th March 1870.
20. Blue Book. "Settlement Report and Statements of the District of Mozuffernuggur for the year 1867."

Minute by the Hon'ble John Strachey, *dated 26th September* 1870.

[Permanent Settlement of the North-Western Provinces.]

The questions which have been referred to the Government of India in connection with the settlements of Boolundshuhur and Baghput have been separately considered and disposed of, and the reasons have been stated which appear completely to establish the justice of Sir William Muir's conclusion, that "the two conditions enjoined by Her Majesty's Government for a permanent settlement are not sufficient."

It is remarkable that, during the long continued and voluminous discussions which have taken place, the facts which the settlements of Boolundshuhur and Baghput have now brought to light, were, so far as I can ascertain, never referred to. Yet these facts are now declared by Sir William Muir, who took so prominent a part in those discussions, and who is perhaps the highest living authority on the subject of the existing revenue system of the North-Western Provinces, to be fatal to the scheme of a permanent settlement in the shape in which it has received the sanction of Her Majesty's Government. We could hardly find a better example to show the imperfection of our present knowledge, or a better proof of the necessity of extreme caution, when we attempt to solve a problem of which the conditions are so complicated; which depends so greatly on future circumstances which cannot now be foreseen; and of which, if the solution be mistaken, the consequences may be ruinous. It is to be hoped that this will not be forgotten, in the future consideration of this subject, and that all hasty conclusions will be avoided. I wish, therefore, that the remarks which I am now about to make, in regard to one of the questions which must come under inquiry, should be merely looked upon as a contribution to the discussion and not as the expression of a final opinion in regard to the course which ought to be actually adopted by the Government.

2. The suggestion has been made at various times and by various authorities, that a permanent settlement of the land revenue should be made, not upon the basis of a fixed money assessment, but on the basis of the value of a fixed quantity of produce, which value would be adjusted from time to time, according to the average prices which prevailed.*

I have long believed that, if a permanent settlement can rightly be made at all, some such principle as this is the only one on which it could reasonably be based. It is, in fact, the only principle on which a permanent settlement which

* Such a system would, I believe, be no novelty in India, for it was, to some extent, adopted by the great Akbar. I can say nothing about Akbar's system from my own knowledge, but I quote the following account of it from a paper by Mr. H. G. Keene, who has paid much attention to these subjects, and who has, for many years, advocated the adoption of this principle of assessment. His first proceeding was to determine the quantity and value of the assets of the land: "He adopted a sound system for the measurement and for the classification of the culturable land in each estate. He then limited the State's demand to the not very light promotion of one-third of the gross produce, which he proceeded to commute into a money-payment on an average of prices for the past nineteen years. This commutation was to be re-considered every ten years, and was to be only obligatory as regards what might be called garden crops. Of the cereals, every occupant was at liberty to tender one-third in kind, if he thought the official valuation too high."

deserves the name is possible, for there is nothing really permanent in an assessment fixed in money, the value of which goes on steadily diminishing or changing. It is also the only principle by which, while leaving to the occupant of the land the benefit of his own improvements, it would be possible, in a great measure, to retain the right of the State to share in that improvement in the value of the land which is due to causes of a general character, with which the occupant has had no concern.

It may be useful if I give a summary of the discussions that have taken place on this subject, so far as they have come under my notice.

Of these, the principal have been with reference to settlements in Madras. I believe that this question has been mooted, from time to time, in that Presidency for many years past; but I have not seen any papers of an earlier date than the year 1861.

3. In a despatch from the Government of Madras to the Government of India, No. 241, dated the 8th February 1862, it was stated that "His Excellency the Governor is favorable to the imposition of a permanent grain rent, but would reserve to Government the power of periodically determining the value of that rent, if at any future time a material alteration in the value of money should render such a measure expedient." In a valuable Minute forwarded with that despatch, and dated the 12th November 1861, the Governor of Madras, Sir William Denison, made the following remarks:—

I would observe that before any permanent settlement could be made, it would be necessary that the Government should decide, once for all, what proportion the assessment or rent should bear to the produce of the land either gross or net.

* * * * * * * *

Assuming, however, that all these preliminary steps have been taken, and that the assessment on the ryot is fair and reasonable, there is yet an important point to consider; one indeed most important with relation to the proposed perpetual settlement, and that is, in what commodity shall this rent or assessment be payable, or in other words, shall the tenant or ryot pay a corn or a money-rent. In paragraph 64 of his report, Colonel Baird Smith talks of the rent as the portion of the net produce hitherto appropriated as Government revenue, which he puts at 50 per cent. of the net produce; but in discussing the question of fixity of the public demand, he evidently applies this fixity, not to the proportion of the crop, or its estimated amount in measures or weight of grain, but to the existing money-value, which, looking to the very marked change which has taken place in the value of money during the last few years, represents a much smaller proportion of the crop. The effect of adopting the existing money-value of the crop as the basis of the perpetual settlement, would be to place the tenant in a position to which he has no claim. I assume that a revision has been made of the assessment, that every thing has been done which could be expected from the best landlord; under such circumstances, the tenant can have no right to the collateral advantages which spring out of the gradual cheapening of money or the alteration of the relation existing between it and produce of various kinds. This is the landlord's fair due, and, indeed, it is the only means by which he can manage to escape the difficulties arising out of the fixed character of the payments made to him, and the ever varying but steadily increasing price of labor and other commodities. * * * * * * *

It would be most unwise to sacrifice the revenue arising from a source so well established, and so well understood by the people of India, as that of a land or produce assessment, upon the supposition that it may be possible to supply the deficit from other sources. While, then, I should not object to a reduction in the proportion of the crop taken as rent, to such an amount as would leave to the ryot a fair return for his labor and his capital, and while I should not object to make this proportion a perpetual charge on the land, I should altogether object to a proposal to place a money-value upon this proportion of the crop at existing prices, and to make this money-value the measure of the rent or assessment to be paid from henceforward.

The Members of the Madras Council did not concur with these views of Sir W. Denison, but there is nothing in their remarks which need now be quoted.

When these papers were received by the Government of India, Sir W. Denison's views were disapproved, but without much discussion. The objections to them were thus stated by Mr. Laing in a Minute dated the 7th April 1862:—

We may, I think, begin by setting aside any idea of a grain settlement as a general measure. There is no grain which, like wheat in England, affords a tolerably uniform and

accurate measure of the value of 'money' as measured in 'commodities.' Wheat does so in England very imperfectly, for a thousand different causes affect the range of price over a long period, as well as the mere supply of the precious metals. But in India, one district consumes wheat, another rice, another dall or some of the many forms of pulse of which we hardly know the names; and the accidents of a wet or dry season, the want of communications throughout such a vast country, and other circumstances, cause enormous fluctuations, often of hundreds per cent., in the market price of grain between one year or district and another. I am satisfied, therefore, that Mr. Maltby is quite right in saying that any form of grain rent would utterly fail to give that security which is the great object of having a settlement at all; and that a fixed money rent, even for a comparatively short period, would be preferable.

It may be observed, with regard to these remarks by Mr. Laing, that he apparently wrote under the mistaken impression that an annual commutation of the corn rent into money had been proposed. Sir W. Denison not only had no such intention, but the adoption of such a plan would have completely frustrated the objects which he had in view.

4. In 1868, the Madras Government, in forwarding to the Secretary of State their proceedings regarding the revision of the assessment of the Salem District, re-opened this question, and proposed that "the grain assessments under the revision of the land tax now in progress may be declared to be permanent, and the money rates changed, if thought advisable by the Government of the day, every thirty years."

The Secretary of State replied to this proposal on the 8th April 1869, as follows:—

I find that since 1856 the question of declaring the grain assessments permanent has frequently been referred for the decision of the authorities in this country, and it has been decided, both by the Court of Directors and by the Secretaries of State, that the settlement should be a money assessment founded upon due consideration of all the circumstances of the districts, and revised after a term of years, and that your Government, so far back as 1858, directed the issue of a notification to this effect. Her Majesty's Government must adhere to that decision, nor do they see, as your Excellency in Council seems to do, in the despatches addressed to the Government of India in and from 1862 to the present time, on the general question of permanent settlement throughout India, anything inconsistent with this view. It seems to me impossible to read paragraphs 66, 67, 69 and 70 of the despatch of the 9th of July 1862, some of which are quoted by your Government, without being impressed with the conviction that it was thought highly improbable that either your Presidency or that of Bombay, but particularly the former, should be brought, or at all events not for many years to come, within the terms under which alone it was permissible to confer a permanent settlement upon the landowners. Your Excellency in Council distinctly states, in the despatch now before me, that 'the time is probably still very distant when any measure limiting the maximum amount of the government revenue,' under the conditions laid down, 'could be adopted without serious injury to the interests of the community and of the State as representing the community, or with any real benefit to small sections of the community or to individuals,' and it certainly is not the desire of Her Majesty's Government to force on any immature concession of this nature. They concur with you in the expediency, and, indeed, the necessity, of keeping in the hands of the Government such a legitimate source from which to supply the increasing wants of the State for the benefit of the people, as the extension of cultivation among waste lands. They are also happy to agree with your Government in opinion that, under the principles of the revised settlement now in progress for adjusting the assessment and fixing it for a term of years, the share taken by the Government is kept within limits which are perfectly equitable to the cultivator. But they are unable to see that it is therefore necessary to make a declaration to the landholders that the grain assessments are to be permanent. On the contrary, they feel themselves precluded, for the same reasons which your Excellency in Council has urged in your 18th paragraph for retaining the waste lands, from sanctioning the surrender of such a legitimate source of revenue as the Government share of the increased value which has been conferred on the land by improved administration, the construction of public works, especially works of irrigation and railways, together with the improved price of agricultural produce.

The Secretary of State added that he had no objection to apply to the Madras Presidency the conditions for a permanent settlement, laid down for the North-Western Provinces in Sir Stafford Northcote's despatch of the 23rd March 1867, "should the conditions be found fulfilled at any of the stated periods for revising the settlement."

The Madras Government replied to the Secretary of State on the 30th September 1869, and requested him, in the following terms, to re-consider his

decision on the question of declaring permanent the grain values arrived at during the revision of assessment :—

The proposal advocated by this Government, while securing many of the acknowledged advantages of a permanent money assessment, will be free from the principal objections to that measure. The political advantage of giving the occupiers of government land a direct interest in the stability of our rule, by declaring that the actual quantity of the crop now taken by Government will never be increased, is considerable. Still greater would be the social advantage of providing a really popular and safe investment for the daily increasing wealth of the country; and though, under the existing system, the desire to become the possessor of land, which is very general among all classes, has had, and will have, the effect of inducing the investment of a certain amount of capital in its purchase, still it is difficult to believe that any large amount will ever be devoted to the *improvement* of land, so long as it is apprehended that after every period of thirty years the increased value which the land has attained by private outlay of this description, will be investigated, and the State demand upon it proportionably augmented. The heavy charge involved in a revision of the assessment every thirty years would also be obviated, as the expensive part of the process lies in the classification and investigation of the different soils, while the mere adjustment of the commutation-rate, which would be all that would be required were our proposals adopted, could be effected without any special establishment or prolonged local inquiries.

Again the main argument against a permanent settlemont of the land revenue, *viz.*, that the State would be thus cut off from all participation in an expanding source of revenue, although the expenses of administration are unavoidably progressive, falls to the ground, if the permanency of the settlement be limited to the grain-values. The State would, under the system recommended, still profit by all extensions of cultivation, and would share with the occupiers of land the increased value given to the land by that natural rise in prices which is usually attendant upon augmented local consumption, larger exports, and greater abundance of the circulating medium.

With advertence to the concluding sentence in paragraph 5 of your despatch, we submit that, however cogent the objections offered may be to a permanent money assessment, they can hardly be said to apply with equal force to our proposal, inasmuch as the Government share of the increased value which will be conferred upon land by improved administration, the construction of public works, etc., must almost invariably take the form of a higher price for the produce of the land. We consequently venture to question the policy of foregoing the general advantages attendant upon the measure proposed by us, for the doubtful and partial gain which might be obtained by a re-valuation every thirty years of the lands to which water has been newly applied as alluded to in paragraph 6 of your despatch.

This remonstrance was answered by the Secretary of State in his despatch to the Madras Government, dated the 17th March 1870. He said that he had again considered the question, but saw no sufficient reason for modifying his former decision.

"If," he said, "as you seem to believe, the ryots are unwilling to devote their labour and capital to the improvement of their lands, so long as it is apprehended that, after every period of thirty years, the increased value which the land has attained by private outlay of this description will be investigated, and the State demand upon it proportionably augmented, I have only to observe that it was never intended that the increased value which might be given to land by the application of private labour and capital should be taken into account in forming any new assessment, and it seems to me that it would be easy to dispel any such impression, if it exists, from their minds by adding to the proclamation notifying the confirmation of the settlement for a term of thirty years, and its liability to revision at the expiration of that period, some words equivalent to those contained in the circular orders quoted in the margin.

"It is to be explained to the ryots that when the general rates of a district may be altered, the demand will be regulated with reference to the intrinsic quality and position of the land, as compared with other land of similar natural soil and situation, and not with reference to any improvement which may have been effected by the ryot at his own cost."—Standing Orders of the Board of Revenue, 1820 to 1865, page 88.

"Under this explanation, the last objection raised in your despatch would seem to disappear. There would be no necessity for any 'classification and investigation of the different soils' on the occasion of a new settlement. Any general causes of increase or decrease which might have come into operation since the previous settlement would have to be duly considered, and any necessary alterations might be made in the grain assessments by the addition or subtraction of a percentage on the recorded amounts. If no ground for change had arisen, the grain assessments, although no pledge would be given for their permenency, would remain unaltered."

5. The same question has been from time to time raised in this Presidency. It will be remembered that the system of making permanent settlements on this basis was advocated in the Report of the Commissioners appointed to inquire into the famine in Bengal and Orissa in 1866. In Mr. George Campbell's "Note on the Permanent Settlement of the Land Revenue," appended to that Report, and dated the 26th November 1867, he wrote as follows :—

It is to reconcile this slow growth of revenue with a rapidly increasing expenditure that the plan suggested by the Commission is recommended—that is the fixing of the land revenue at determinate amounts, expressed in corn-rents and commuted to money according to the average of a series of years.

The result of such a system would be that all the evils of re-settlements, and all fear of increase of the revenue demand on account of individual exertion and improvement would be avoided; the revenue would be in one sense absolutely fixed; but on the other hand it would be liable to periodical re-adjustment with reference to the changes in the relative value of money and the chief staples of production in each district, in exactly the same way as are the commuted tithes and other payments in England, and both tithes and rents in Scotland. The great change in prices, in wages, and in the value of money generally, which seems to be so imminent all over India, and which is the most immediate objection to permanent settlements effected at this particular period, would in this manner be guarded against. And while we should probably not secure quite so great an increase of revenue as if we were free from time to time to make re-settlements without check or limit, we should still have an increase proportioned to the general progress of the country and of the expenditure, and which would render it unnecessary too much to hasten the advance of new taxation.

The mode of determining and adjusting the average prices of each series of years is so well known by experience in England and Scotland, and is so analogous to the use of current prices of the pergunnah in the annual revenue adjustments of almost all Native States, that I need not enter into futher particulars.

I may, however, add that the effect of recent decisions of the highest courts having been to place by far the most numerous class of subordinate holders on a footing similar to that proposed for the superior landholders,—the ryots having a right of occupancy being liable to enhancement of rents in proportion as the market value of agricultural produce increases—the revenue paid to Government, and the source of that revenue would adjust themselves in a fitting manner on the same principles, and the machinery, used for striking average prices for one purpose being available for the others also, would save much litigation, contention, and loss to all parties.

6. Sir William Muir, in paragraph 40 of his Minute of the 22nd December 1869, has referred to this question; and although he has not given any final opinion, it may be inferred that he decidedly inclines to the conclusion that the basis of a permanent settlement ought to be a grain and not a money assessment.*

7. Since this Minute was written, I have seen, in the proceedings of the Punjab Government for June 1870, a memorandum by Sir Donald McLeod, written about the time when he ceased to be Lieutenant Governor, and in which he strongly advocates the adoption of a permanent settlement on the basis of a grain assessment. There is no one who is entitled to speak with higher authority on this subject, and I have appended a copy of his memorandum to this Minute.

8. I will add only a few words regarding the views which I am myself disposed to hold.

In the Minute which has been quoted above, Sir W. Denison observed that before any permanent settlement could be made, it would be necessary to determine the proportion which the Government assessment should bear to the gross or net produce of the land. This is, in fact, the same point which has been brought out so strongly by the experience that has now been gained in the North-Western Provinces.

If, as I have said elsewhere, a permanent settlement is to be allowed at all a third condition appears essential, in addition to those laid down by Her

* Mr. Drummond, when Lieutenant Governor of the North-Western Provinces, made the following remarks in a Minute written in 1864, but so far as I have been able to ascertain, he did not again refer to the subject, nor does it appear to have been considered by the Government of India:—"It was at one time my intention to suggest the propriety of fixing the assessment for the permanent settlement in grain instead of coin; that is, that the average rate of produce per acre of the principal descriptions of crop should constitute the standard of valuation, the cash equivalent for which should be regulated by the market value of the produce, liable to re-determination, say every twenty years. Such a provision would meet all objections founded upon variations in the value of the precious metals and of prices; but upon full consideration, I apprehend that it might lead to doubts as to the *bonâ fide* permanence of the assessment. It is, I think, an open question whether some such provision should not be admitted into the engagements of the ryots with their landholders."

Majesty's Government, namely, that the assessment shall not be less than 50 per cent. of the existing net assets of the land. I do not say of the existing rental, for this may be, and frequently is something totally different.

If these three conditions be fulfilled, I am disposed to think that a permanent settlement on the basis of a grain assessment might be allowed without any ruinous sacrifice of future interests. The result would be, to some extent at least, that which it has always been the desire of the Government to obtain,—a system under which improvements made at the expense of the occupants of the land should lead to no increase in the demands of the State, while, on the other hand, the State would not lose the whole of the benefit derived by the land from improved administration, from the construction of great public works, and from the general progress of the country. Improvement of the latter kind is measured, with at least some approach to accuracy, by the increase in the average price of produce for a number of years.*

The decision of the Secretary of State in regard to permanent settlements in Madras does not appear to be inconsistent with the opinion that, under other circumstances than those which prevail in that Presidency, a permanent settlement of the land revenue on the basis of a grain assessment might be desirable.

I understand the contention of the Secretary of State to have been substantially this,—that no permanent settlement of any kind, whether on a money or grain basis, was expedient in a country like Madras where certain preliminary and essential conditions had not been fulfilled.

Two such conditions are those which have been laid down by Her Majesty's Government in regard to the North-Western Provinces. It must be shown before any estate can receive a permanent settlement, *(first)* that the area of cultivation has almost reached the maximum that is possible; and *(secondly)* that there is no probability that the existing assets will, within the next twenty years, be largely increased by the introduction of canal irrigation.

It being assumed that under ordinary circumstances, these conditions are not fulfilled in Madras, it cannot, I think, be disputed that a permanent settlement of any kind would be inadmissible; for, whatever further conditions may be necessary, it appears clear that these two conditions cannot be dispensed with.

9. It may be noticed that the system which has been now referred to is similar in principle to that which has been adopted in England and Ireland under the acts for the commutation of tithes.

"The chief object of these statutes" (I quote from Kerr's Blackstone, Vol. II., p. 30) "is to substitute the payment of an annual rent of defined amount for the render of a tenth of the titheable produce of the land, or the payment of an arbitrary composition. To effect this, the gross amount of the annual sums to be payable by way of rent-charge in substitution for the tithes is first ascertained. One-third of the amount, when ascertained and settled, is to be represented by such a quantity of wheat, another third by such a quantity of barely, and the remaining third by such a quantity of oats, as the rent charge, if invested in the purchase of those three species of grain, would have purchased at their average prices per bushel during seven years ending Christmas 1835 The tithe rent-charge is, therefore, in the nature of a corn-

* In regard to this part of the subject, I may quote the following remarks from a paper written by an accomplished officer of the Government, Mr. LePoer Wynne, who has had much experience of settlement operations in the North-Western Provinces. Advocating a permanent settlement on the basis of a grain assessment, how, he asks, independently of improvements derived from the extension of canal irrigation or from the expenditure of private capital, would any general cause of increase or decrease in the value of the land manifest itself, otherwise than by an increase or decrease in the price of produce. "Why," he says, "hesitate to put in words what you have accepted in fact? As you have assured the people that you will not tax their improvements, why not complete your assurance by telling them that what you *will* tax will be the difference between average prices now and average prices hereafter? * * Let it be considered how much is gained that it is desirable to gain, how much is avoided that it is expedient to avoid by the adoption of this small change. The State gains a revenue, the increase of which will correspond with that very rise of prices by which much of the increasing expenditure is caused. It gains a security for the loyalty of the landowners based on their sense of interest, and without the sacrifice involved in the attempt to gain this object by permanent settlement in its worst form. And it avoids the heavy expense, and the temporary diversion of the services of its best officers, which temporary settlements cause. The landowners gain a security that their improvements will never be taxed, and that their contribution to State necessities will never depend on the discretion of any one man. They gain a power of disposing of their land at high prices, and they avoid the heavy contributions which they must pay on the occurrence of each re-settlement; and they escape the loss in low rents and poor cultivation, which they have, with the same object, willingly undergo for some time previously."

rent; but the payment is made in money, and varies annually, according to the average septennial value of the above three species of grain on the Thursday next preceding Christmas day in every year, as the same is published in the *London Gazette* in the month of January."

10. I do not now purpose to enter into this subject further. Although I have stated generally the views which I am myelf disposed to hold, I do not think that the questions at issue have been so fully discussed that it would now be desirable for the Government of India to express any final conclusion regarding them. I think that the proper course now to adopt is to invite the Lieutenant Governor of the North-Western Provinces to re-consider the whole question.

Minute by His Excellency the Viceroy on Permanent Settlement of the North-Western Provinces.

In respect to the great question referred to by Mr. Strachey in his memorandum which more than any other affects the future of our revenue and our relations with the people of this country, I am anxious to make a few observations, though, perhaps, it may be deemed presumptuous so to do; but having been all my life engaged in the consideration of matters affecting the valuation, taxation, and tenure of land, and the profits of agriculture, I do not find that the leading principles which ought to guide us in coming to a conclusion vary in India and in Europe as much as may at first be supposed.

I have always thought that the great desideratum to be aimed at in land tenure is the greatest amount of permanency in occupancy that can be obtained, which is consistent with securing a fair division of profit as between the parties who possess a direct interest in the land.

I am fully aware of the great evils that must attach to a constantly-recurring adjustment of the many interests in land.

As, on the approach of the expiry of a long lease in the United Kingdom, improvement and exertion cease, so, on the approach of the period of re-settlement, and during its tedious and protracted process, the same evils must occur in India.

In corroboration of this, I may add that an experienced Settlement Officer described to me the commencement of these operations. He said—"They have been expecting me here for three years; we shall be four or five years getting through the work, and for the three years past, and for the five next years, everything in the shape of agricultural progress in the district has been, and will be, at a stand-still."

Indeed, the temptation to conceal value, and to make out that the property and the people are poorer than they are, is greater in this country than it can be in Europe, and many devices can be carried out for defeating an accurate valuation here which cannot be undertaken at Home, the valuers being, in a great measure, without the leading test which regulates all such operations in civilized countries, namely, the test of "letting value" which keen competition regulates.

I am bound, however, to say that the disturbing effect of settlement operations to the extent described is not admitted by many of the officers engaged therein.

On this cardinal point I own I should like more full information, for, on its right understanding, a correct decision greatly depends.

I am not insensible to the great political value of the feeling of security which a permanent settlement assessed at a moderate rate creates, and I fully believe that the Bengalee will never have any desire to change his master if he is under the impression that our successors would make him pay more for his land.

On the other hand, if it is a recognized fact that the Government have such a proprietary right in the land as justifies it in demanding a certain share of its profits, it is unjust that the State should participate neither in their increase, nor in the depreciation of value which, in the lapse of time, may occur. This view is correct as regards the matter of right.

It is also equally true as regards expediency, for as land revenue must always be the mainstay of Indian finance, and as with growing prosperity demand for improved administration and all public expenses are likely to increase, perfect non-elasticity of land revenue must, if adopted, impose upon future Governments the necessity of laying heavy burdens on the people in the shape of taxation, which will always be more or less obnoxious in its character, and will be more difficult to raise than the well known and generally accepted contribution from the land.

The question, then, for us to consider is—can any system be devised whereby the evils of disturbance can be avoided, the Government being at the same time secured in the participation of that increase in the value of their proprietary right in the land which is almost certain to occur?

In order to endeavour to solve this problem, it is necessary to consider the modes in which the value of land can properly be ascertained.

There are four principal modes by which the value of land is usually ascertained:—

1*st*.—Quantity of produce.	3*rd*.—Quality of soil.
2*nd*.—Price of produce.	4*th*.—Letting value.

The objection to testing value by quantity only is, ***first***, that it is most difficult and nearly impossible to ascertain; and, ***secondly***, that it depends to a great extent upon the varying industry of the cultivator and the chances of the season.

The objection to testing value by average price only is that, if a certain division of profit between owner and occupier is aimed at, when dearness is occasioned by scarcity, the owner gets too much; and when cheapness is caused by plenty, he receives too little.

Quality of soil is doubtless an element in all accurate valuation of land; and, when examined by experts, may form an element of consideration for the valuer.

A scientific and chemical test of soils is worth very little, but its colour and texture, and, above all, the appearance of the produce, give indications which, to a practised eye, can hardly be deceptive.

The letting price of land is the best and surest test of value in countries where proprietary rights are well ascertained and constantly exercised, and competition, as at an auction, determines what the thing is worth.

In the United Kingdom, therefore, valuers are now instructed to consider in their operations mainly the letting value, and disregard more than formerly the other considerations of quantity and price of produce and quality of soil.

We may now consider how far these modes of ascertaining the value of land are applicable to India. Take the last first.

It is clearly shown in these papers that the amount paid by the occupier in the shape of rent is delusive as a test of value.

In India, where rent is fixed under so many different considerations; where rights of occupancy so generally exist; where forced labor and service is often recognized; where land is let at different rates for reasons of family, religion, and caste; where, as a rule, there is little or no competition for the occupation of hired land; where the rent receiver's interest is to induce the tenant to stay; where the whole custom and feeling of the country is against disturbance, and

where, even in some of the most highly-cultivated districts, such as the pergunnah of Baghput, herein mentioned, rents have scarcely increased, notwithstanding a very great advance of agricultural improvement, and the increase of value of produce. Where all these circumstances exist, it is impossible to affirm that valuation formed upon such a basis would be reliable. Indeed, a notable instance of the truth of this is described by Mr. Strachey, clearly showing that an assessment, such as was made in the settlement of the Roy Bareilly District, in Oude, upon the basis of actual rental, is, as a test of value, comparatively worthless.

It is clear, therefore, that, for the present, except in towns and their immediate neighbourhood, the letting value of land, or the rent paid, can form in India no safe test of its value.

The consideration of the quality of the soil may, perhaps, under certain conditions, be taken into account; and where the investigations necessary for settlement are extremely minute, I have no doubt that it might be, and is really, occasionally used; but it can never form a very important element in the operation of determining the value.

There remains then the two elements, the quantity of produce and its price.

The difficulty of ascertaining the quantity of produce raised per acre, year by year, has been found to be the greatest difficulty that the agricultural statistician has to contend with.

I have myself been engaged in attempts to answer satisfactorily, from my general knowledge of the state of the country at harvest, the annual inquiries as to quantity that are made of all landholders and proprietors for the purpose of framing the Irish agricultural returns.

I own that, after some years' experience, I came to the conclusion that information of this kind is utterly unreliable, and I believe the only approach that can be made to the correct ascertainment of the quantity of agricultural produce raised in a district in each year, is the quantity that is brought to market.

But there is another objection to leaning too much upon quantity as a test of value, more especially as between the Government proprietor and the revenue-payer. The average increase of quantity from one year to another is often the result of increased industry on the part of the tiller of the soil. Though I do not agree with those who think that the proprietor has no right, under any circumstances, to any share in the profits of the land, which is directly traceable to the industry of the tenant, still the Government, from motives of prudence and considerate policy, should be slow to levy a contribution which would be a direct burden on the fruits of industry or exertion.

This, therefore, is an additional reason against making "quantity of produce" in a particular year a main feature in periodical valuation of land.

We come, then, to the price or value of produce, which, though its testing value may be in some respects impugned, is, as regards this country, a basis upon which we could proceed.

The valuation of land made on a uniform principle and scale of price for agricultural produce is the only way in which we can ensure that the relative value of the land within any district, or the relative value of the lands of different districts, though ascertained at distant and different periods, should be the same.

The facts are perfectly reliable and easily ascertainable. There can be no mistake about them.

As our communications improve, the surplus produce of every farm will find its way into the traders' hands, there can be no concealment or evasion; and if proper statistical returns are collected, no special enquiry is necessary.

If we now settle the profit which Government ought to take from the land in proportion to present price, it would not, I think, be difficult to devise a simple system which, without burdening industry or individual exertion, would secure

to the Government in future years that large portion of the profits of land to which it is entitled.

If, therefore, in the present settlements, the value of agricultural produce is laid down on a certain scale, as it was in the Irish Valuation Act of 1852, it would be easy, by a self-acting process, to decide at certain periods what the future payment in respect of lands now settled ought to be.

The parties interested then would generally know, almost to a rupee, what the increase or decrease of their payment at the beginning of each stated period would be, while the natural increase in quantity, which would not be considered as an important element of calculation as against the revenue-payer, would have the continual effect, as years roll on, of placing him in a more favorable position than he is now.

I do not say that by this means Government would obtain all that it is really entitled to, but it would get in an easy way that increase in revenue to which no objection can justly be taken, and it would probably in future years afford to the State a sufficient sum to meet all its growing responsibilities.

In respect, however, to these two items of quantity and price, we must recollect that the valuation of land in India is made for purposes somewhat different than in the United Kingdom—valuation there is not made to determine the amount of rent which should be paid to any one for the land, but to lay a basis for taxation. Comparative accuracy of value, as between districts, is what is first aimed at in order that the tax-payers in different places should pay equally.

Therefore it is that in Ireland the Government valuation of the land by no means represents the amount of rent usually paid; it is only relatively correct.

In India, at original settlement, it will always be necessary to consider more fully, than in Europe, the quality of the soil and quantity of produce which, under fair cultivation, is ordinarily produced; but once this is established, the fluctuation of market price may form the main test for determining value from time to time.

All the foregoing remarks apply only to cultivated land.

Special arrangements, similar to those undertaken at original settlement, would have to be made about waste or uncultivated land, but it would not be difficult to frame such rules as would secure the fair and proper payment of revenue from those vast wastes which will gradually be placed beneath the plough in India.

With regard to the newly-irrigated districts, their position as regards settlement can hardly be thoroughly discussed until the principles of the new canal legislation are settled.

It is possible that, as the water is recognised to be the property of the State, a seignorage might in future days be levied; and indeed the principle has lately been acted on in respect to that part of the Sirhind Canal which will run through the Phoolkian States.

These points, however, are only partially involved in the general question which we are now discussing.

I therefore suggest for present discussion the view that the main principle upon which the future demand for land revenue might be decided is the average market price of agricultural produce, the Government percentage of future profit being regulated at the same proportion to price as it bore at the period of settlement. But, in addition to this, it might be fair to take into account, to a certain limited extent, the increased quantity of produce as evidenced by the amount which passed through the markets of each district. This, however, should bear a much smaller proportion to the fixed percentage of profits than the price.

I have not taken into consideration the "value of labor" which, doubtless, in India, will have a tendency to rise, and might, therefore, be supposed to form a claim in favor of the revenue-payer; but I am certain that the increase in

quantity, which will gradually take place, and which, as I have shown, will not be taken fully in account on the part of Government, will amply compensate him for the increased cost of labor.

I believe that by such means as I have described, it would be possible to obtain from Indian land the just rights of the Government to secure the people against obnoxious and unsuitable taxation, and, at the same time, to avoid those evils which uncertainty of liability and the process of re-settlement must ever produce.

But if the adoption of such a system as I have described is impossible, if the objections which can be urged against it are found to be too weighty, then no other course is open to us but to continue that system of periodical settlement which obtains in the greater part of India, and which, though it is attended with many evils, is not inconsistent with justice, and is in accordance with Native custom and tradition.

The 7th February 1871. MAYO.

No. 5, dated Simla, the 21st July 1871.

From—The Government of India,

To—Her Majesty's Secy. of State for India.

In continuation of our despatch in the Home Department, No. 7 (Revenue), dated the 26th May, on the question of the introduction into the North-Western Provinces of the principle of the permanent settlement of the land revenue, we have the honor to forward for your Grace's information copy of a letter* and of its annexures from the Government of the Punjab on the same question as affecting that province. One of these papers, Sir D. F. McLeod's Minute, has already been forwarded with our letter cited above as an appendix to the Minute of the Honorable J. Strachey.

* No. 250—550, dated the 13th August 1870.

• No. 24, dated India Office, London, the 20th July 1871.

From—Her Majesty's Secy. of State for India,

To—The Government of India.

I have considered in Council the despatch of your Excellency in Council, numbered 7, and dated the 26th of May, with which you transmit a collection of very important papers on the settlement of the land revenue in the North-Western Provinces. You refer me especially to your despatch to the Lieutenant Governor of the North-Western Provinces of the 26th May, for the reasons which led you to concur with Sir William Muir in the opinion that it has been clearly proved that the conditions hitherto laid down for the admission of districts in India to a permanent settlement are insufficient, and if acted on would lead "to most serious and certain injury to the future interests of the public." You inform me that you have thought it necessary to request the Lieutenant Governor to reconsider the whole question, and you express the hope that I shall agree with you that the orders contained in Sir Stafford Northcote's despatch of the 23rd of March (No. 15) 1867 should be held in a abeyance.

2. After a careful perusal of the despatch to which you have referred me, Her Majesty's Government has no hesitation in assenting to the proposal of your Excellency in Council, and authorises your Government at once to suspend all proceedings towards the permanent settlement of any district until the results of the reconsideration, in all its bearings, of this momentous question, together with the opinions of your Government thereon, shall have been laid before me.

No. 26, dated India Office, London, the 27th July 1871.

From—Her Majesty's Secy. of State for India,

To—The Government of India.

Referring to my despatch of the 20th instant, No. 24, expressing my readiness to agree to the proposal of your Excellency in Council for suspending the orders severally issued by Secretaries Sir Charles Wood, Earl de Grey and Ripon, and Sir Stafford Northcote, which allowed the introduction of a permanent settlement on certain conditions in such districts as might be fit for it, I have to inform you that the Select Committee of the House of Commons on Indian Finance, in the Report which they have laid before the House of Commons, have stated,—

"Your Committee have, however, been much impressed with the evidence which has been laid before them respecting the directions which were given by the Secretary of State for India in Council, in the year 1862, to extend the system of permanent settlement of the land revenue prevailing in some of the Bengal Provinces to other parts of India.

"They have not yet been able to receive the evidence of those by whom the directions were either recommended or issued. Whilst, therefore, they abstain from expressing any opinion on the question, they think it right that the attention of the Secretary of State for India in Council should be called to this evidence, in order that he may reconsider the subject, and in the meantime, determine whether steps should not be taken to suspend any further proceedings to carry out the despatch of his predecessor."

2. I need not impress upon your Excellency in Council the importance of Her Majesty's Government being placed in a position to form a judgment upon this important subject, so soon as you shall have fully weighed the additional evidence which is to be furnished to you by the Lieutenant Governor of the North-Western Provinces.

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SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, OCTOBER 7, 1871.

OFFICIAL PAPERS.

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GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

Transfer of the control of certain Guaranteed and State Railways to the Government of India.

Resolution by the Government of India in the Public Works Department,—Nos. 1883—1901 R, dated Simla, the 29th September 1871.

READ again—

Despatch from the Government of India, to the Secretary of State for India,—No. 45 R, dated Simla, the 13th May 1871.

In commencing the construction of railways by the direct agency of the State, we considered it desirable that, at the outset, no sudden change should be made in the system by which public works had, up to that time, been carried out, and that establishments should at first be formed and operations conducted by a gradual expansion of existing means, leaving the consolidation of the arrangements into a settled system for further consideration. It appears to us that the time has now arrived for placing the scheme of State railway construction and administration on a definite basis, and for organizing a system which shall provide for the present requirements of lines while under construction, and for their management when they shall have been opened for traffic. In consequence, however, of our desire to

utilize and expand existing establishments in preference to creating new ones, we combined the discharge of duties connected with the State and Guaranteed Railways under the old Railway Branch of this Department, and we have therefore found it necessary, in considering this question, to review the organization by which the operations of Guaranteed Railway Companies are at present controlled, and to ascertain whether any modification of this organization appears to be called for. To this portion of the question we shall first address ourselves.

2. It will be within your Grace's knowledge that, soon after the commencement of the guaranteed system, when lines of railway were undertaken simultaneously in different parts of India, the executive control devolving on the Government under the conditions of the railway contracts, was delegated to the several Local Governments in whose territories the lines were projected, a general supervision of the whole being exercised by the Government of India. It was thought that, by this arrangement, both the advantages of local knowledge and a harmony of action with the other branches of the Administration (wherein the Government of India usually retained no direct executive control), would be more effectually secured than in any other way, while the supervision of the Government of India would be sufficient to cause the same interpretation being placed in different Provinces on all the provisions of the identical contracts entered into with different Companies. Thus it was arranged that, in Northern India, the Government of Bengal should control the Lower Division, and the Government of the North-Western Provinces the Upper Division, of the East Indian Railway. This system continued in force for some years, and, so long as the lines thus controlled were moderate in extent and lay wholly within the boundaries of one Province, no difficulty was experienced; but, when junctions between isolated portions of the same Railway or between two different lines were made, a provincial cantrol proved to be impracticable. It was found to be necessary that the control of the operations of each Guaranteed Company in whatever direction these might extend, should rest in the hands of a single authority. The division of a railway, such as the East Indian, into two or more portions under separate management, was both unsatisfactory and extravagant, and it was seen to be essential to the commercial prosperity of such a railway that it should be worked as a single undertaking. But, when this was accomplished, it further became evident that the controlling functions of Government, in the exercise of which much discretion and tact must be employed, could not possibly be divided between two or more authorities, and that a change had to be made in the system of administration to suit the altered circumstances of the case.

3. The only way of arriving at the desired unity of control was by the re-assumption by the Government of India of the powers delegated to Local Governments, or by the transfer of the control over the whole of the undertakings of each Company to some one selected Local Government. Upon a deliberate consideration of the matter the Government of India decided on adopting the latter course, which has been followed in the case of all Guaranteed Railways subsequently commenced. The necessity of uniting the control over the whole of the affairs of any one Company, and placing it in the hands of one authority, was expressly acknowledged by Her Majesty's Government on the occasion of the establishment of the Oudh and Rohilkhund Railway, and, as tested by experience, there can be no doubt of the propriety of such a measure.

4. The result of this change has been that the Government of Bengal controls railways in—

Bengal,
North-Western Provinces,
Punjab,
Central Provinces,
and the Native States under the Central India Agency.

The Government of the North-Western Provinces (in which there is a greater mileage of Guaranteed Railway open and under construction than in Madras, Bombay, Bengal, or any other Province of India) controls none of these railways.

The Government of the Punjab controls railways in—

Punjab,
North-Western Provinces.

The Administration of Oudh controls railways in—

Oudh,
North-Western Provinces.

Thus, out of 2,742 miles of Guaranteed Railway open and in progress in Bengal, the North-Western Provinces, Oudh, and the Punjab, 1,153 are controlled by other Governments than those of the territories in which they lie.

5. It is evident that the result of the present arrangements has been that the advantage of local knowledge in the control has had to be placed aside. The executive supervision of a single Government has been found far preferable to a divided control, but it is a compromise which entails many disadvantages. The controlling Government has, beyond a doubt, a more intimate acquaintance with the requirements of its own Province than of the wants of those which adjoin it, and, so far as local knowledge is of advantage in railway management, the interests of the Districts not under the government of the controlling authority are, in spite of the best intentions, liable to suffer. We have endeavoured by various means to cause the desires of out-lying Governments to be fully represented and acted upon by the controlling authority, but with doubtful success, and the consequence has too often either been an unfortunate conflict of opinion, or, more frequently, a failure in the proper representation of local interests, in both cases leading to no useful result.

6. These difficulties were, in a great degree, foreseen when the present system of control was established in regard to the East Indian Railway in 1865. But we were in hopes that it would have been in practice possible to avoid or to reduce them to slight inconveniences. We were further of opinion that the control by a Local Government, even under the circumstances explained, should be attempted in preference to introducing into the Government of India an exceptional agency for direct executive control.

7. There are several circumstances which now make this latter reason no longer of the same force. One of them is the multiplication of the complication of territorial control as above mentioned, the case of the East Indian Railway in Bengal and the North-Western Provinces being now only

one of many amongst which we may now place the Punjab Railway Company's undertakings in Sindh, lately amalgamated with the lines under the Punjab Government. Another circumstance is that the financial results of the working of the Guaranteed Railways have no immediate influence on the revenue of any one Province, but directly affect the Imperial Treasury. As year follows year, the receipts from the working of the railways become of greater importance to the country at large; and, so long as the Supreme Government have to provide means for the expenditure of the country, the financial control of the railways must remain in its hands. But, in railway matters, finance and administration are so nearly allied as to be incapable of separation, the one being the direct consequence of the other, and therefore it has been found practically impossible to leave the administrative control of the guaranteed lines to be regulated exclusively by the Local Governments. This state of things is by no means conducive to good administration, as it often leads to differences of opinion between the Supreme and Local Governments from which much positive disadvantage and loss has at times arisen, and that unity of control, which was aimed at when the present system was established, has not been secured. A third reason is that the same sort of difficulties will arise in connection with the State Railways, as will presently be explained.

8. We are therefore of opinion that a change of organization by the transfer of the entire control of the Guaranteed Railways in Upper India now, or shortly to be, in connection with each other from the Local Governments to the Government of India, is the best measure to adopt. In arriving at this conclusion, we have been aided by the advice of the late Sir H. Durand and of Sir W. Grey, both of whom have expressed themselves in favor of the view which we advocate.

9. We need not at the present time do more than sketch briefly the outlines of the system which we propose. The control of Guaranteed Railways is now exercised by Consulting Engineers to the different Local Governments, aided by Deputies and by Examiners of Accounts. The official record of the transactions of each Railway Company, which, under the contract, require approval on the part of the Government, is contained in the Minutes of Meetings which are held weekly between the Railway Agent and the Consulting Engineer. At these meetings the Consulting Engineer transacts business, giving sanction in behalf of the Government, or not, according to certain prescribed rules, and both he and the Agent bring forward any propositions that either may desire to make. With this routine we have every reason to be satisfied, and we do not propose to change it. Our desire is that the Consulting Engineers, with their establishments, should be simply transferred from the Local Government and placed under the Government of India, receiving certain definite and, perhaps, extended powers to enable them to authorize such things as it may be desirable for them to deal with finally, and that their formal proceedings should be submitted for sanction to the Government of India instead of to the Local Government. The wishes of the several Governments in regard to matters connected with the railway administration, might be expressed in two ways, either by directly addressing the Government of India, as is the custom in all other matters connected with the administration of their respective Provinces, or, in less important cases, by arranging for a periodical meeting between the Consulting Engineer and the Secretary to the Local Government, or other officer, in which such matters might be discussed, the

conclusions at which the Meeting may arrive being formally recorded in the same way as the Minutes of the Meetings with the Railway Agents.

10. On this footing we recommend the transfer of the control over the following Guaranteed Railways to the Government of India:

The East Indian.
The Eastern Bengal.
The Sindh, Punjab, and Delhi.
The Oudh and Rohilkhund.

11. We now pass to the consideration of the system by which the State Railways now in progress should be administered. Having, as we premised, hitherto expanded the existing system of the Public Works Department without much modification to provide for the commencement of operations, we have had some opportunity of seeing how far this organization will suffice for future wants. The different projected railways have been divided into suitable lengths and placed in charge of Superintending Engineers, who are under the immediate direction of the Chief Engineers in the Public Works Department to the several Administrations, by whom the projects for all State Railways are submitted to us. In cases where the professional advisers of any Administration have not had any considerable experience in the construction of railways, the control exercised over the Superintending Engineers is really nominal, and these officers receive their orders practically direct from the Railway Branch of our Public Works Office.

12. The objections to this arrangement, which were, indeed, foreseen from the outset, are serious. To attain great excellence in any branch of engineering, it is generally necessary that the attention should be confined mainly to that branch to the exclusion of others, and it may thus not unfrequently happen that the officer selected on account of his administrative capacity and general professional ability to be the Chief Engineer of a Province, may yet be not so well acquainted with the details of railway construction as a Superintending Engineer under his orders, who has turned his attention exclusively to that branch of engineering. As, moreover, for reasons which we will presently recapitulate, it is essential that the general principles of design, the scale of establishments, and the supply of funds for these railways, should be regulated by the Government of India, the intermediate authority of the Local Administrations would, in this case, be almost powerless for good, and, therefore, a real evil. This is practically the form which the direction of State Railways has, in some cases, already assumed, and it has to be considered in what direction it should now be modified.

13. One plan which suggests itself is the formation of a special Railway Branch of the Department in all Provinces in which railways are undertaken. This would lead to a serious increase in the establishments and in the cost of the works, which could only be justified in view of certain tangible advantages. The effect of this system would be two-fold,—the general control and direction of the works by the Local Administration to the extent of the power which could usefully be confided to it, would be assured, and the active supervision of the construction by a competent authority intermediate between the Superintending Engineer in charge and our own professional advisers, would be provided for. In order to ascertain

the advantages or disadvantages of such a measure, it is necessary to consider whether powers of executive control and sanction, with their attendant responsibility, could be properly delegated to the authority that would thus be interposed; for, if this should not be the case, its intervention would evidently be worse than useless.

14. The construction of State Railways by funds borrowed on the credit of the Indian revenues, has been deliberately undertaken with the entire approval of Her Majesty's Government, and of the public, on the faith of the utmost economy being thus made possible. On a full review of the circumstances of the revenue, it appeared to us to be practicable to set aside a certain amount year by year to provide for the interest on the borrowed funds, and we considered that, if the railways constructed by these means were made as cheaply as we saw reason to anticipate, the extension of railway communication could proceed at such a rate as to meet the reasonable wants of the country without imposing any fresh burden on the people. Cheapness of construction is, then, an essential element in the success of the scheme. But this cheapness of construction directly depends on the details in which one railway varies from another, and, to ensure it, certain conditions of principle which allow of no deviation must be prescribed by supreme authority. Over all expenditure, then, which is incurred on the spot, it appears to be impossible usefully to delegate any final powers of sanction to the Local Administration, except in such minor matters as are usually and, in our opinion, properly entrusted to the executive officers of the Public Works Department. Still less can any such powers be exercised in the design of locomotive or rolling-stock, or of such machinery and iron-work as must be procured from England, or of the permanent-way, all of which, amounting to fully one-half of the cost of a line, must be dealt with on a larger review of the wants of the whole country than would be locally possible.

15. It would thus appear to be impossible to delegate to Local Administrations any practical power of sanction or direction of these railways. Neither the direction of the line, nor the character of its formation, nor the design or extent of its structures, nor the accommodation it will provide, can be left to be decided apart from prescribed rules, for on all these things the cost of a railway depends. Besides this, it is plain that, to introduce this system in the case of lines running through more than one Province, would be to repeat the defects of the control of the Guaranteed Railways above referred to, and it would therefore be necessary to divide the Districts into lengths which would suit the boundaries of each Province. This would in many, if not in all, cases entail additional expense, and be very difficult to effect. For these reasons we do not consider that any administrative advantage would be gained by the intervention of the Local Civil Governments in the construction of the State Railways now projected.

16. We are, therefore, of opinion that the engineers in charge of the construction of State Railways should be directly under the orders of the Government of India, and should carry out the construction of the works entrusted to them without the intermediate agency of Local Administrations. The general control of the construction would be given to the Consulting Engineer to our Government, regarding whom we have recently addressed your Grace (despatch No. 7, Railway, dated 31st January 1871).

In case of the more important lines, the works might be under an officer holding the position of a Chief Engineer; while, in the case of minor railways, considering the skill and ability of the officers whose services are available for employment as Superintending Engineers, it does not appear to us that the interposition of any authority in matters of pure engineering between them and our own immediate professional advisers, would be beneficial, or would have any other result than delay in correspondence and increased expenditure.

17. There are, however, other duties to be performed in connection with these railways apart from those of a purely professional character. It is necessary that an agency should be created for the conduct of the general business connected with the establishments, accounts, and management of the stores, &c., of the lines while under construction, in such a way as to be transformed into a convenient agency for general management, so soon as the railways shall have been opened for public traffic. This might, of course, be done by appointing special officers for the purpose; but, if any existing organization could be thus utilized, it would result in a considerable economy. It appears to us that this might be arranged in some Provinces by confiding these duties to the officers who are charged with the Government control of the Guaranteed Railways with considerable saving of cost and with other allied advantages. It appears perfectly feasible to unite under one officer the chief Government control of guaranteed lines and the chief executive management of the working of State lines, and by affording him the necessary subordinate assistance in the latter case with which he has already been supplied in the former capacity, to ensure the conduct of both descriptions of business in an efficient and yet economical way. In cases where such an officer does not exist, the principal officer of the accounts branch connected with the line might be charged with the general management.

18. We, therefore, propose that an officer, to be called Director, should be appointed as the General Agent for each line, or aggregation of lines, of State Railway; to receive orders from, and generally to represent, the Government of India in respect to that railway, and to be responsible for every thing connected with its prosecution, except its engineering. On professional matters, the Chief or Superintending Engineer of the line would be independent of the Director, and would receive orders from the Government of India direct; but, in all other matters, he would be subordinate to this officer. The Director would have general charge of the accounts, in the care of which he would be assisted, if necessary, by other officers, according to the magnitude of the charge. The arrangements by which the Local Administration should be represented, and should record their desires, would be similar to those above proposed for Guaranteed Railways, which would thus be linked in administration to the State Railway system without the jarring of conflicting views, or the re-duplication of establishments.

19. Under this system the Consulting Engineer in Bengal would also be the Director of any State Railway that may be undertaken in that Province, and the Consulting Engineer in the Punjab would be the Director of the Indus Valley and Punjab Northern lines, having under him the Chief and Superintending Engineers of these railways [who, as before said, would be independent in engineering matters], and such assistants as might be needed for the regulation of the accounts of each line. Similarly, a

Director would be appointed for the Rajpootana Railway; and, as in this case there would probably be no Guaranteed Railway work which might usefully be performed by him, his duties would be confined to this State Railway. Like arrangements would also have to be made for the conduct of railway business in Central India, Mysore, and Hyderabad.

20. The substance of these proposals is to assimilate the control of State Railways constructed from imperial funds to that which experience has shown to be necessary in respect to the railways constructed from guaranteed capital, and in both cases to make better arrangements for the representation of local desires than has yet been accomplished. We believe that the measures now proposed are calculated to achieve this end, and we therefore recommend them to your Grace's consideration.

21. It will be observed that we have made no references to the railways under the Governments of Madras and Bombay. We have at present no change to propose in regard to them, except in relation to the Sindh, Punjab, and Delhi Railways, concerning which we have addressed you separately.

Despatch from the Government of India, to the Secretary of State for India,—No. 46, dated Simla, the 13th May 1871.

WE have the honor to acknowledge the receipt of your despatch No. 44, dated 14th July 1870, in which your Grace, in forwarding one part of the contract with the Sindh, Punjab, and Delhi Railway Company relating to the amalgamation of the several undertakings of the Company, requests an expression of our views on the arrangements to be made for the future management of the affairs of the Company in India, and on the manner in which the control of Government shall be exercised. We also beg to acknowledge the receipt of your despatch No. 77, dated 30th November 1870, forwarding copy of letter No. 42, from the Directors of the Company, to their Agent in India, relative to the re-organization of the staff and the location of the chief agency in India.

2. We have elicited the views of the Governments of Bombay and the Punjab on these important subjects, as set forth in the documents which are attached to this despatch,* and we have also received a copy of the letter from the Board of Directors (No. 13, dated 15th July 1870), to their Agent, on the organization of their local arrangements, and of the Agent's reply† thereto.

* Letter from Bombay, No. 453, dated 28th March 1870.
Letter from Bombay, No. 1440, dated 21st October 1870.
Letter from Bombay, No. 1554, dated 21st November 1870.
Letter from Punjab, No. 3259 G, dated 26th August 1870.
Letter from Punjab, No. 3262 G, dated 26th August 1870.

† No. 41, dated 16th August 1870.

3. It is, in our opinion, unquestionable that, in order to attain both economy and efficiency in the transaction of the business of the Company, the management of their amalgamated undertakings shall be concentrated under one chief authority. The present isolation of certain portions of the works, and the technically different kinds of executive supervision required for a road and river service, may possibly make it requisite to place more power in the hands of some of the subordinate officers than would otherwise be the case; but, under any circumstances, the whole of the general and financial management of the Company's local affairs should, in our opinion, be vested in one chief Agent. If this were not done, no administrative advantage whatever would be gained by the amalgamation of the

several undertakings, and the propriety of such a concentration appears to be sufficiently obvious without further argument. On this point the Governments of Bombay and the Punjab are in complete accord with us, and the Board of Directors and the Agent for the Punjab and Delhi Railways hold the same view.

4. The next point for consideration is the location of the chief agency, supposing it to be thus concentrated. It is evident that the choice of locality must be limited to the places through which the several lines pass, as it is of primary importance that the Agent should reside on the works which it is his duty to prosecute and administer. This limitation practically confines the choice to Kurrachee and Lahore as the two most important places on the Company's undertakings. The Government of Bombay have recommended that Kurrachee should be selected as it must, in their opinion, be considered the main terminus or chief point of the united lines. The Government of the Punjab, on the other hand, have recommended the location of the chief agency at Lahore, and this is the desire of the Board of Directors. We also observe that in the contract into which your Grace in Council has lately entered with the Company, notices in the case of purchase, possession, surrender, &c., are expressly stipulated as having to be served at Lahore.

5. After full consideration of the views taken by the different authorities, we are decidedly of opinion that Lahore should, at all events for the present, be chosen as the local head quarters of the united lines. To whatever extent the port of Kurrachee may be developed, it cannot, in our opinion, be advisable to place the seat of administration of such extended works at one extremity of them without special reasons, which do not, in the present case, exist. The Sindh Railway is isolated from the Punjab and Delhi Railways, which are five times its length, by the interposition of the Indus Flotilla, which can be as conveniently directed from Lahore as from Kurrachee. Lahore appears to us to be the most advantageous site for the residence of the chief Agent, both from its central position and from its importance, which is likely to increase with the prosperity of the Punjab, and with the construction of new railways in the north of India.

6. We now turn to the second point on which your Grace has requested us to state our opinion, namely, the manner in which the Government control is to be exercised. The experience of the past clears the way to a certain extent for the consideration of this question. It will be within your Grace's knowledge that a few years ago the control of the State over some lines which extended through more than one Province was divided between the Local Governments. In this way a portion of the East Indian Railway was controlled from Calcutta, and a portion from the head quarters of the North-West Government. As, however, the lines were completed and opened for traffic, the evils of this divided control became so marked as to make its consolidation under one Government imperative, and this was accordingly done. Since that time it has become more and more evident that this course must be followed in all similar cases, in order to obtain economy in working. In your predecessor's despatch No. 92, dated 30th November 1867, on the control of the Oudh and Rohilkhund Railway, both in the North-Western Provinces and Oudh, by the Chief Commissioner of the latter Province, Her Majesty's Government expressed a similar opinion, and considered it undesirable that control should be exercised by more than one Government over one Railway. In this view we entirely concur.

7. The Governments of four Provinces are directly concerned with the territories through which the united lines of the Sindh, Punjab, and Delhi Railway Company pass, *viz.*, Bombay, the North-Western Provinces, the Punjab, and Sindh. The Bombay Government have recorded their opinion that the control of the undertakings should be vested in them, as they consider Kurrachee to be an auxiliary port and off-shoot of Bombay. This view is not the one which we are disposed to take, nor does the argument appear to us to be of weight. We have already expressed our conviction that the head quarters of the Agent should be at Lahore, and it follows, as a matter of course, that the Government must be represented at the seat of Agency by the officer who is charged with the executive control and supervision on its behalf under the provisions of the contract, for under no other arrangement could this control be properly enforced, or business rapidly despatched. This being the case, and looking to the status of the Punjab Government, we can perceive no advantages that would result from placing this local office under the control of another Local Government, the seat of which is at such a distance as that of Bombay.

8. If, then, the representative of Government at the head quarters of the Agency were to be placed under the immediate direction of any Local Government, it appears to us that the Government of the Punjab should be charged with this duty. But for reasons which we have explained in a separate despatch, we have proposed, with your Grace's approval, to place the local officers of Government, to whom is delegated the control of the railways in Upper India, in direct communication with the Government of India without the intervention of any intermediate authority, under which arrangement the control of the undertakings of the Sindh, Punjab, and Delhi Railway Company would be exercised in precisely the same way as that of the Guaranteed Railways in Bengal, the North-Western Provinces, and Oudh. We shall hope to receive at an early date the orders of your Grace on the particular case dealt with in this despatch, as well as on the general case referred to.

9. Although the immediate financial results of the amalgamation of the Sindh, Punjab, and Delhi Railways, and the Flotilla, may not show any great reduction in the cost of working the different lines, we are of opinion that the concentration of authority, and the unification of accounts and audit, will enable considerable reductions in the supervising establishments to be effected in the course of the next year or two. We enclose a copy of a resolution ordering an enquiry into this subject, and we purpose to address your Grace again as soon as the re-organization of the staff has been carried out, and to report what economy has been found practicable in the direction and working arrangements of the united lines.

Read also—

Despatch from the Secretary of State for India, to the Government of India,—No. 57 R, dated India Office, London, the 15th August 1871.

Your Excellency's despatches No. 45 of the 13th May last, relative to the re-organization of your Railway Department generally, and No. 46 of the same date, relative to the control to be exercised over the amalgamated undertaking of the Sindh, Punjab, and Delhi Railway Company, were duly received by me, and I have since informed you by telegram dated 13th July, that arrangements for the re-organization of the Railway Department are left in your hands.

2. I will only add that I have some doubt as to the manner in which that part of your plan will work, under which, in the case of State Railways, the Chief or Superintending Engineer will receive orders direct from Government on engineering matters, but will be subordinate, in all miscellaneous affairs, to the Government Consulting Engineer, or, if such officer do not exist, to the principal officer of the account branch connected with the line. There seems room for apprehending that the conflicting pretensions of such officers may be unfavorable to harmonious action.

3. I understand from the concluding paragraph of your despatch No. 45, that the proposed arrangements, with regard to State Railways, are not intended to apply to any that may be constructed within either the Madras or Bombay Presidency.

Resolution.—The reasons by which the Government of India have been led to the conclusion that the control of the Guaranteed Railways in Upper India and of the State Railways generally should be centralized, are recorded at length in the first of the despatches now read again, and Her Majesty's Government having assented to the measure, as also to the transfer of the control of the Sindh Railway and Indus Flotilla from the Government of Bombay, the grounds of which are explained in the second of those despatches, it only remains to issue the needful orders for giving effect to the changes which are rendered necessary by these decisions.

2. *Firstly*, as regards the Guaranteed Railways. At present the control of these Railways in Upper India is under the Governments of Bengal and of the Punjab, and the Oudh Administration. In each of these Provinces there is a Consulting Engineer's Department charged with the immediate duty of carrying out the local control, which, in each case, extends into other jurisdictions. This department will now be dissevered from the Local Governments, and the officers composing it will be gazetted as Consulting Engineers and Deputy Consulting Engineers and Examiners of Accounts to Government for Guaranteed Railways, and henceforth be immediately under the orders of the Government of India in the Public Works Department. Their head quarters will remain, as at present, with the head quarters of the guaranteed undertakings under their control, *viz.*, at Calcutta, Lahore, and Lucknow, and their present office establishments and records, including those of the Joint Secretaries' Offices, should be retained by them. It is essential that their offices should continue to be in the close vicinity of those of the railways controlled, and the Government of Bengal should, therefore, be requested to permit existing arrangements at Calcutta to continue. It is expected that some reduction of office establishments may be effected. This subject will be considered after some experience of the new system of working.

3. The Government of Bombay should be moved to transfer the services of the Deputy Consulting Engineer and the Assistant Examiner of Accounts in Sindh to the Government of India with the office establishment, and to issue instructions to the Railway Agent in Sindh that the Government control over the Sindh Railway and Indus Flotilla will, in future, be exercised by the Consulting Engineer at Lahore on behalf of the Government of India. The records of the Consulting Engineer's office in Bombay relating to those undertakings, should be forwarded to the Consulting Engineer at Lahore, and

the Government of Bombay should be requested to report what reduction of establishments may be possible in the Consulting Engineer's office in consequence of this change.

4. The powers of sanction in railway matters exercised by Local Governments, as modified by Public Works Department Resolution Nos. 49-54 A—R, dated 6th February 1871, will now be delegated to the Consulting Engineers in Upper India; but this delegation will be regarded as tentative, for experience may show the necessity of modifying or curtailing those powers.

For the present, therefore, the Consulting Engineers will continue to discharge their duties very much as heretofore, but with this modification, that in matters hitherto within the competence of Local Governments, the action of the Consulting Engineers will be subject to the review of the Supreme Government instead of the confirmation of the Local Government, and that in matters beyond those powers, they will refer direct to the Government of India. In all cases in which the Consulting Engineer would have taken the orders of the Local Administration before acting, but in which, under the present orders, he will now act on his own authority, he should report at once his proceedings to the Government of India.

5. It will be understood, however, that, in future, all sanctions to projects, or to revisions of projects on new lines or on lines not open to traffic, also to establishments for them, must emanate from the Government of India. For other work-sanctions the Resolution already quoted provides. Establishments of open lines will be sanctioned, in the first instance, by the Government of India, and, thereafter, the present practice will be continued, *i. e.*, half-yearly lists will be submitted and dealt with at an official meeting; but the discretion hitherto permitted in the case of offices, the salary of which is less than Rs. 400 per mensem, must be exercised strictly within the provision made under each head of the revenue budget estimate, orders as to which have recently issued.

6. Business will be transacted, as heretofore, at official meetings between the Consulting Engineers and the Railway Agents, and sanctions given at other times should be formally recorded at the first meeting thereafter. The minutes of the official meetings should be full without being prolix, and should be submitted in print to the Public Works Department of the Government of India punctually and promptly, supported by copies of all needful documents as appendices. The minutes of each meeting should be despatched on the day that they are confirmed, and, in order that there may be no undue delay in their submission, such confirmation should be given at a meeting, or otherwise, within one week of the meeting of which they form the record.

7. A monthly abstract of the proceedings of the Consulting Engineers will be submitted for review in the Public Works Secretariat. This abstract should be a complete schedule of the business transacted during the period; but, in the case of matters dealt with at official meetings, a simple reference to the minutes will suffice if the record contained in them be full and complete. The abstract of proceedings should be in the form of the contents of Part B. of the monthly Volumes of the Proceedings of Local Governments now submitted in the Railway Branch of the Department; but every care should be taken that they are clear and intelligible. They should be despatched punctually, and in print, within one week of the close of the period. There should be no difficulty in this, if the preparation and printing of the abstract be carried on throughout the month.

8. The proceedings of the Consulting Engineers will be recorded in manuscript, printing being only resorted to for minutes of meetings (if not printed by the Railway Companies), abstracts of proceedings, inspection reports, revenue account notes and reviews, and other lengthy notes or documents of importance.

9. Dissociated as the Local Government now will be from the control of these railways, the Governor General in Council is disposed to think that, by exhibiting a keen interest in their working, they may, as the independent representatives and exponents of public opinion and local knowledge, exercise a powerful influence on the management which will be most advantageous alike to the Supreme Government, and to the public. Representations made with this view will always meet with the most careful consideration. The Governor General in Council relies with confidence on the support and aid of the several Local Governments in the endeavour to improve the efficiency of the railways within their respective jurisdictions, or to correct abuses, so that these grand lines of communication may fulfil the objects for which they were constructed, in such a manner as to meet the wants of the Districts traversed, and to conduce, in every reasonable way, to the convenience and comfort of the masses when travelling, and to the advancement of the commerce of the empire.

10. Dissevered as the Consulting Engineers now will be from the Local Governments, it will be none the less incumbent on them to attend carefully to local and non-departmental interests and requirements in reference to the undertakings over which they will exercise the degree of control necessary on behalf of the Government of India. In this view they will not fail to bring before either the Local or the Supreme Government, or to the notice of the railway management concerned, any matter that may seem to deserve attention, or to be likely to contribute to the interests of the railways, and the public, and they will be careful that the wishes of the Local Governments are met to the fullest extent compatible with the general interests confided to their charge, and their duty to the Supreme Government. The periodic inspections of open lines will continue to be made, and copies of the reports should be forwarded to the Local Governments for information and for any remarks they may desire to offer, and the Consulting Engineers will give due consideration to such points as may be indicated by Local Governments as requiring attention.

11. The views and wishes of the Local Governments should, as a rule, be made known to the Consulting Engineers through the Secretary in the local Public Works Department, either by written or personal communication, so that, in cases in which it may be necessary to take the orders of the Government of India, the Consulting Engineer's reference may be complete and in such form as to admit of the issue of needful orders with the least delay. This course will not preclude Local Governments and Administrations from addressing the Government of India direct in any case the importance of which may seem to make it desirable.

12. *Secondly*, as regards the State Railways. It has first to be provided that the Calcutta and South-Eastern line will continue to be managed, as at present, under the orders of the Consulting Engineer for Guaranteed Railways in Calcutta, the accounts continuing to be dealt with by the Examiner of Guaranteed Railway Accounts.

13. Matters that may arise in connection with the proposed railway extensions north of the lower Ganges will also continue, for the present, under the same control.

14. The Consulting Engineer for Guaranteed Railways at Lahore will continue to retain the general supervision of the Punjab Northern Railway, and the accounts of the work will be dealt with, for the present, as heretofore by the Controller of the Punjab Government.

15. The Indus Valley line will also, for the present, remain under the same control, but will shortly be placed under an officer with the powers of a Chief Engineer acting directly under the Government of India, and a separate Deputy Controller acting directly under the Accountant General will be appointed for the accounts and audit of the line.

16. The Rajpootana Railway and the Moradabad and Roorkee Railway Surveys are, at present, under the Government of the North-Western Provinces, the Public Works Secretariat of which was specially strengthened when the surveys for railway extensions were first commenced by the addition of an officer of railway experience, whose services, with those of a small office establishment, will now be no longer required. This officer is required for other duties, and his establishment will be transferred to the Office of the Public Works Secretariat of the Government of India. The whole of the business of the Rajpootana line will now be conducted directly under the orders of the Government of India by the Superintending Engineers of the sections in which the construction operations of the lines are now organized; but, until other arrangements are made for the accounts, they will continue under the charge of the Controller of the North-Western Provinces.

17. It is uncertain whether the Moradabad and Roorkee Railway will be carried out; but, for such work as may remain in connection with this line after the submission of the projects by the Government of the North-Western Provinces to the Government of India, orders will issue hereafter.

18. In Central India the project for the Indore and Khundwah Railway has been nearly matured, and the preliminary surveys for an extension towards Northern India have been commenced. The most convenient position for the head quarters of these lines is Mhow or Indore, and the work will be carried on by the Superintending Engineers under the direct orders of the Government of India. The accounts will be dealt with by the Controller, Central India, for the present.

19. In the Central Provinces the surveys in progress may remain, for the present, under the Chief Commissioner, whose Chief Engineer has taken such a leading part in the preliminary investigation of the schemes. As soon as the projects are sanctioned, the arrangements for bringing the work of construction directly under the Government of India will be considered.

20. The same arrangement will hold good for the present in British Burmah in regard to the projected Rangoon and Prome Railway.

21. The Nizam's Railway is, as its title indicates, the property of the Hyderabad State, and it is essential that the British Resident at Hyderabad should have a potential voice in the management of it, as well as of the small branches in the Berars, which have been constructed with the surplus revenues of those Provinces. No alteration will be made in the existing arrangements for carrying on this work.

22. Lastly, there is the Mysore line. For this, if sanctioned by the Secretary of State, orders will issue hereafter. Meanwhile the existing arrangements will not be disturbed.

23. The powers of Chief Engineers under the Public Works Code are delegated to the engineers in charge of State Railways, with this exception that, in the case of contracts for the works generally of sections of railway, the tenders should be referred for the orders of the Government of India.

24. Weekly schedules of business will be submitted to the Government of India by the officer in charge of each railway now brought under the direct control of the Government of India.

25. The Stores Department will be subordinate to the engineer in charge of each railway, when there is no other authority intervening between the Government of India and the latter.

26. It will be the duty of the officers in charge of the State Railways, now brought immediately under the orders of the Government of India, to keep the local authorities fully acquainted with what is going on, or is contemplated, affecting the interests of the Provinces or of the Native States traversed, and to elicit their views on all questions that it would be obviously proper and desirable that they should have the opportunity of expressing them, regarding such an important matter as a first class communication traversing the territories or districts under their jurisdiction. Amongst such points may be specially mentioned as requiring an expression of the views of the local authorities, the position of stations, the precise location of the line in the vicinity of towns, the provision of crossings on the level or otherwise, and other like conveniences. The Local Governments and Administrations must, of course, be referred to regarding the taking up of land, and the provision of approaches to stations.

27. As already expressed, in the 9th paragraph of this Resolution, in respect of Guaranteed Railways, so in the case of State Railways, the Governor General in Council relies confidently on the hearty coöperation of the Local Governments and Administrations interested territorially in the several lines projected.

28. Lists of the engineer and other establishments employed on State Railways, or in control of Guaranteed Railways, should at once be forwarded to the Public Works Department of the Government of India, in order that they may be formally transferred; and the Governor General in Council requests that the Local Governments and Administrations marginally named will issue orders to the officers concerned, that from the 10th October 1871 they, with the undertakings in their charge, will pass under the direct control of the Government of India—all needful office records being transferred with them.

Bombay.
Bengal.
North-Western Provinces.
Punjab.
Oudh.
Agent to the Governor General for Central India.

ORDER.—Ordered, that a copy of this Resolution and of the two despatches to and from the Secretary of State referring to the general question, be forwarded to all Local Governments and Administrations for information and guidance.

Also, that a copy of the despatch No. 46, to the Secretary of State, be forwarded to the Governments of Bombay and the Punjab.

Also, that a copy of the Resolution and of all three despatches be forwarded to the Financial Department of the Government of India for consideration of any measures that may be called for in that Department.

Also, that a copy of the Resolution be sent to the other Departments of the Government of India for information, and to the Accountant General, Public Works Department, for information and guidance.

Lastly, that copies of the three despatches be sent to the Home Department for publication with the Resolution in the Supplement to the *Gazette of India*.

The following abstract of the Quarterly Progress Reports of the principal works of irrigation under construction from loan funds in the different Provinces is published by Order of His Excellency the Governor General in Council for general information: a statement of the revenue derived from the same class of works will be similarly published annually:

MADRAS.

Estimates of works in progress.	Expenditure during quarter ending 31st March 1871.	Expenditure during official year 1870-71.	Total expenditure incurred.
Rs.	Rs.	Rs.	Rs.
20,48,134	37,409	81,707	4,36,078

Godavery Delta.—This project, which was commenced in the year 1847, has been carried on from year to year as funds from the ordinary revenues of the country became available. It being desirable to complete a scheme which has proved of such benefit to the Godavery District, and yielded large profits to the State, estimates, amounting to over 26 lakhs of rupees, have of late been sanctioned from loan funds for works necessary to complete and perfect the system of irrigation and navigation in the eastern and western sections of this delta. In the central portion like works are eventually to be undertaken at a probable expense of six lakhs. During the last quarter of the year the improvements in progress to the Akeed and Samulcottah Canals, in the eastern section, were completed at an expense of nearly 2½ lakhs of rupees. On the latter canal 30 miles of earthwork have been executed, and 41 bridges and culverts built. Satisfactory progress was also made on improvements to the Coconada Canal. In the western section the following progress has been made:

Ellore main canal and low level channel ...	One-third completed.
Mid level channel	One-half ditto.
Canal from Ellore high level channel to the River Weyairoo ...	One-quarter ditto.
And the Nursapoor Canal ...	One-sixth ditto.

Some progress was also made on the Attili Canal. Of the drains under construction, chiefly in the western section, the Pandikodu was nearly finished at a cost of over half a lakh of rupees, and satisfactory progress made on other minor ones. There are about 1,000,000 acres of arable land in this delta, and the irrigation works have proved very profitable.

Estimates of works in progress.	Expenditure during quarter ending 31st March 1871.	Expenditure during official year 1870-71.	Total expenditure incurred.
Rs.	Rs.	Rs.	Rs.
14,72,743	38,916	94,371	8,84,553
4,20,060	17,819	66,980	2,55,802
10,50,000	...	...	9,10,000
1,98,235	10,623	36,834	36,834

Kistna Delta.—The works in this delta have been estimated to cost about 60 lakhs of rupees, of which more than half has been expended since the year 1851-52 in which they were commenced up to the close of the year 1869-70. Of the expenditure yet to be incurred estimates for about 5½ lakhs have as yet been sanctioned, leaving others to be yet submitted to the extent of about 19 lakhs of rupees. The works undertaken during the year consisted chiefly of improvements and extensions to the Ryves and Masulipatam Canals on the left bank, and the Commamore Channel on the right bank of the Kistna, as well as the excavation of several subsidiary irrigation channels comprised in the scheme. The acreage irrigated in 1869-70 was—

	Acres.
In the Eastern Delta ...	63,928
„ Western „ ...	64,395
Total	128,323

while the *additional* acreage that will ultimately be irrigated by the works now in progress is as follows:

	Acres.
In the Eastern Delta ...	206,072
„ Western „ ...	165,605

In the *Nellore* District the Survapully Channel, which is the main duct, led off from the anicut built across the Pennair at Nellore, is being improved at an estimated expense of about 4½ lakhs of rupees, of which 2½ lakhs of rupees has already been incurred, and will bring under wet cultivation 25,500 acres of land. The outlay noted provides for the completion of the irrigation canals in the Pennair Delta to the mouth of the river, with embankments to protect the irrigated lands from inundations.

On the water-works, *Madras*, over 9½ lakhs have, up to date, been expended. This project is of a mixed character, providing for the irrigation of between 8,000 and 9,000 acres of waste land, as well as the water-supply of the city of Madras. It has not as yet been finally classed as a loan work.

For an *anicut* across the River *Vellaur*, in South Arcot, at Pelandorai, about two lakhs of rupees have been sanctioned, one-fifth of which was expended in its construction during the year. Irrigation will be supplied from this work to 16,650 acres.

Estimates of works in progress.	Expenditure during quarter ending 31st March 1871.	Expenditure during official year 1870-71.	Total expenditure incurred.
Rs.	Rs.	Rs.	Rs.
3,71,130	18,315	36,897	1,76,123

In the *Tanjore* delta the proper regulation of the several rivers has long been represented as a matter of necessity to ensure a more equable distribution of the water. The regulating works sanctioned in March last for the improvement of the River Cauvery have all been completed, while satisfactory progress has been made on similar works authorized for the principal branches of the River Vennaur. The supply of the River Coleroon is also to be regulated. The total cost of the entire scheme of regulation is estimated at about ten lakhs of rupees.

8,31,600	3,131	94,314	5,54,898

In the *Tinnevelly* District the construction of the Streeviguntum anicut or weir on the Tambrapoorney River, which falls into the sea a few miles south of Tuticorin on the east coast of the peninsula, is progressing satisfactorily. This weir will command an area of about 120 square miles, and the channels to be taken off from it will not only serve for direct irrigation of the lands on both banks of the river, but will feed some large tanks which occupy the higher level of the land to be irrigated. The works will also supply water to the town of Tuticorin, which is one of the chief ports of Southern India, and is at present ill furnished with fresh water for domestic purposes.

In addition to these works several extensive projects are under investigation, from the Rooshkolia and Chicacole Rivers in Ganjam, the River Pennair in Nellore, the Perryaur in Madura, and others which it is unnecessary to detail at present.

Bombay.

6,87,978	...	...	5,75,443

Krishna Canal.—This canal, which has under command 44,000 acres of irrigable land in the Sattara District, has been completed. The chowkies or inspection-houses are now in progress.

2,19,409	...	...	2,33,803

In the Ameednuggur District the *Lakh* Canal, 21 miles long, and which will irrigate 17,000 acres, is under construction, and will very shortly be completed.

98,416	...	...	80,831

The *Palkhair* Canal, 11½ miles long, also progresses satisfactorily, and has as much as 20,000 acres of land under command.

6,13,331	...	...	6,89,263

In *Khandeish*, the Jamda Canals, which are capable of irrigating 50,000 acres, have been nearly completed, as also the Mooktee Nullah Reservoir. The latter is situated on a tributary of the River Panjra, and has about 10,000 acres of culturable land under command.

1,97,714	...	...	2,01,716

In Sholapoor the Ekrookh Tank, which has been under construction since 1866, and with its channels, will irrigate about 22,000 acres of land, will shortly be completed. The perennial canal, from the Adeela River is to be commenced immediately.

9,45,613	...	...	8,59,430

In Poona an extensive scheme of irrigation is in progress, termed the Moota project. It consists of a dam across the Moota River with a canal on the right bank 100 miles long, and also a small canal to Kirkee on the left bank, and will irrigate eventually 70,000 acres.

37,47,273	...	...	17,97,909

In Guzerat the Hathmuttee Canal is being constructed for the irrigation of about 35,000 acres: the first five miles have been nearly completed.

3,40,096	...	...	40,345

In addition, complete plans and estimates for the Bhokur tank and canals from the River Taptee have been submitted to Government, and plans and estimates for a project from the Saburmuttee are at present under review by the local authorities.

A canal, 129 miles in length from the Neera, has also been projected. The area under command will be about 437 square miles, the irrigable area being about three-fifths of this. The object of the proposed work is to relieve the locality from continuous drought.

Sindh.

During the past year, the Thurr Canal, 24 miles long in the direction of Oomercote, and the Mitrow Canal, 87 miles in the Eastern Narra District were completed at an expenditure of about eight lakhs of rupees. The former irrigates 42,000 acres, and the latter 160,000 acres.

7,29,820	...	...	7,08,256

A canal, 63 miles in length, has for some time past been in progress from Sukkur to Shadadpoor, and is now approaching completion. All the masonry works and several rajbuhas have been completed. Irrigable area under command 85,500 beegahs. Satisfactory progress has also been made on the scheme for improving the Begaree Canal, and extending it for the irrigation of Seer lands—irrigable area 57,000 acres. The Pinyaree and Goongrah improvement project has been completed and is under review at present. An extensive canal

4,04,824	...	...	1,76,183

from Roree to the vicinity of Hydrabad has also been projected, and the scheme is at present under the consideration of the Government of India.

BENGAL.

Orissa project.—Full particulars of this project will shortly be published in the *Gazette.*

Its estimated cost amounts to 277½ lakhs of rupees, of which 117 lakhs have already been expended, and the eventual net revenue has been estimated at 44½ lakhs or 16 per cent. on outlay.

The following facts were reported in October 1869:

"The Kendrapara Canal, 40 miles long, connecting Cuttack with the Port of False Point and having under command 270,000 acres of culturable land, has been completed.

"Also 23 miles of the first section of the high-level canal between Cuttack and Calcutta to the point where it touches the Trunk Road; the remaining 10 miles of the first section are in full progress, and the second and third sections, measuring 31 miles, are about to be commenced. Seven miles of the Taldundah Canal are on the eve of completion, and 20 more are in progress, also eight miles of its main branch to Machgong." Of the Midnapoor series, 24 miles of navigation between the Hooghly and the Cossye at Panchkoorah have been opened, and the earthwork of ten miles from Midnapoor towards Panchkoorah has been excavated to a surface width of 60 feet and is conveying water for irrigation purposes. The remaining 15 miles are in full progress. Two reaches of the Tidal Canal between the Roopnarain and the Russoolpoor, measuring 26 miles, have also been completed, and of four locks, one has been finished and a second is in progress. There are thus 123½ miles of canal open, 7 more nearly finished, and 74 miles in progress. Moreover, all the great head-works, consisting of anicuts and sluices, *viz.*, the Naraje at the bifurcation of the Mahanuddy and Katjooree, the Mahanuddy and Beropa at Cuttack and the Cossye at Midnapoor, are now completed as far as present requirements are concerned.

"Of distributary channels, 136 miles had been opened in Cuttack and 57 miles in Midnapoor; in the former District water could be conveyed to 120,000 acres, and in Midnapoor to 74,000 acres, or to 194,000 acres in all."

Estimates of works in progress.	Expenditure during quarter ending 31st March 1871.	Expenditure durind official year 1870-71.	Total expenditure incurred.
Rs.	Rs.	Rs.	Rs.
4,35,387	23,294	...	2,74,313
1,60,083	6,539	...	12,160
1,22,280	15,204	...	78,920
1,59,516	364	...	364
11,74,852	80,705	...	9,28,075
2,36,205	9,288	...	1,03,187
3,00,000	28,070	...	2,27,921
20,52,293	81,726	...	19,34,485
3,13,000	5,850	...	1,45,213
7,98,386	41,991	...	6,26,868
75,772	751	...	73,544

The progress made during the past year was as follows:

Taldunda Canal.—Earthwork completed and canal ready for admission of water. Navigable as far as Sonepoor Lock, a distance of 15 miles from Cuttack and ready for irrigation as far as the 27th mile. It commands, with its branches and distributaries, an area of 400 square miles or 232,000 culturable acres. Fair progress made on its distributaries.

Machgong Canal.—Earthwork completed. Locks and falls in progres. This canal is a branch of the Taldunda and will irrigate an area of 82,000 acres. Distributaries just commenced.

High Level Canal.—Range 1. Very satisfactory progress made in excavation of canal up to 25th mile, and provision of locks, aqueducts, and bridges. The irrigable area commanded amounts to 89,000 acres included in an area of about 150 square miles.

Distributaries.—No. 6 distributary cut for 6 miles, No. 11 completed to end, and Nos. 7, 9, and 10 put in thorough order; five new head sluices built.

Distributaries from Kendrapara Canal.—Thirteen distributaries completed.

High Level Canal from Midnapoor to River Hooghly.—Main canal in first, second and third reaches completed to full depth and width. Five locks and three falls constructed. As a line of navigation from its proximity to Calcutta, &c., this is the last and most important of the seven sections of the high level canal, and it will irrigate an area of about 180,000 acres.

Distributaries.—Eighty miles completed, 11 miles now under excavation, and 20 more ready to be put into hands of contractors.

Tidal Canal.—Nearly completed. Two locks finished and two in progress. This canal is intended mainly for navigation.

A range of workshops was also built.

Sone project.—This project has been estimated to cost 377½ lakhs, but if extended beyond the Rivers Kurumnassa on the west and Sukree on the east of the Sone, the cost is likely to exceed 400 lakhs. The area embraced is 2,611,000 acres altogether. The estimates yet sanctioned for the works amount to about 90 lakhs of rupees. Full particulars of the scheme were published last year in the *Gazette.*

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The following is a brief account of the works in progress at present :

	Estimate of works in progress.	Expenditure during quarter ending 31st March 1871.	Expenditure during official year 1870-71.	Total expenditure incurred.
	Rs.	Rs.	Rs.	Rs.
Weir across Soane and head works at Dehree and Baroon.—Work was commenced on the anicut in October last, but an unexpected flood occurred and threw it back. Since then satisfactory progress has been made in its construction and also in that of the head sluice and lock at Dehree.	16,53,528	82,319	...	2,66,015
Tramway and Quarries.—Single line of road is open all the way from the quarries to Baroon on the east side of the river, and locomotive engines and trains of stone are running regularly. Several bungalows have been built for the establishment employed on the works.	99,320	8,334	...	56,659
Western Main Canal.—About nine-thirteenths of the earthwork in the first four miles of the heavy cutting at the head are out to the 50 feet base and three-eighths of the rest to the 22nd mile. Satisfactory progress made on three bridges.	7,86,529	88,883	...	3,16,285
Eastern Main Canal.—First mile seven-ninths of work done, 2nd to 7th mile almost completed to 60 feet base, diverted drainage channel widened, and culvert finished.	2,44,265	37,620	...	1,82,224
Workshops.—Several buildings completed.	1,26,800	30,367	...	62,730
Survey operations.—The Buxar Canal has been set out, as also nearly all the Arrah Canal distributaries. Cross levelling of the country to Chunar well advanced.				
NORTH-WESTERN PROVINCES.				
Remodelling Ganges Canal.—Estimates amounting to over 36 lakhs have hitherto been sanctioned for this purpose, of which a great portion has already been expended. The remodelling operations consist partly in alterations and improvements to the bed of the canal, so as to allow of its conveying with safety the full volume of water, for which it was designed, and for increasing the efficiency of the main canal as a line of navigation. During the past official year several falls and rajbuhas, &c., were remodelled, and a number of bridges and chowkees constructed.				
In the Northern Division two falls were improved, and the Tansipoor rajbuha remodelled. The works undertaken to increase the facilities of the Jowalapoor navigation channel were also completed, and some additional inspection-houses erected.	28,697	6,769	24,160	24,281
In the Meerut Division the Jani-Khoord escape was nearly completed, and the	1,82,530	3,265	18,643	1,45,239

Estimates of works in progress.	Expenditure during quarter ending 31st March 1871.	Expenditure during official year 1870-71.	Total expenditure incurred.
Rs.	Rs.	Rs.	Rs.
1,26,631	7,133	32,158	1,09,989
6,404	542	2,234	6,405
1,67,965	15,502	33,425	1,49,979
2,37,696	3,030	11,042	2,17,217
69,361	6,225	12,768	57,817
18,43,658	2,01,906	5,62,394	15,74,288
1,56,123	4,166	23,611	1,05,894

Jansuth rajbuha was disconnected from the Futtehgurh Branch Canal.

In the Boolundshuhur Division some rajbuhas were completed, and several inspection-houses and bridges, &c., constructed.

In the Allygurh Division a canal office was completed.

In the Cawnpore Divison alterations to 22 bridges were in progress, and are fast approaching completion.

In the Etawah Division five rajbuhas were constructed, two others commenced, and some bridges widened and improved.

Eastern Jumna Canal.—The Yarpore rajbuha was extended and an inspection-house built.

Agra Canal.—This canal, which is to be 110 miles in length, will utilise the water of the Jumna and irrigate and supply water communication between the Districts of Agra, Bhurtpore, Muttra, and Delhi. It has been estimated to cost approximately 57½ lakhs of rupees, of which detailed estimates for over 20 lakhs have already been sanctioned. Its capacity will be sufficient for the conveyance of 1,100 cubic feet per second, sufficient for the irrigation of an area of from 270,000 to 300,000 acres. Considerable progress has been made in the excavation of the whole length of the canal. The excavation up to the 50th mile has been nearly finished and further on the works are far advanced; several inspection-houses and subsidiary works connected with the canal have already been built.

Rohilkhund Canals.—This scheme, which is likely to cost about 50 lakhs of rupees and is of a somewhat complicated character, consisting of no less than nine different sets of canals, is to be dealt with in separate portions. Lately estimates amounting to 4½ lakhs have been sanctioned for canals from the Rivers Paha, Kylas, and Kitcha. The project is not, however, to be carried out from loan funds, until satisfactory proof has been afforded to the Government of India of its proving remunerative. This point is now under consideration.

Two other extensive canals have been projected in the North-Western Provinces, *viz.*, the East Ganges Canal, estimated to cost about 100 lakhs of rupees, the project for which is at present under revision; and the lower Ganges Canal, the estimates for which amount to over 180

lakhs, and are now under the consideration of the Government of India. Surveys, are also in progress for the extension of irrigation in Bundelkhund, &c.

	Estimates of works in progress.	Expenditure during quarter ending 31st March 1871.	Expenditure during official year 1870-71.	Total expenditure incurred.
	Rs.	Rs.	Rs.	Rs.
PUNJAB.				
The Baree Doab Canal.—This canal has been estimated to cost 177 lakhs of rupees; the total expenditure incurred on it up to 1st May 1868, amounted to 116$\frac{1}{7}$ lakhs. In May 1870 estimates amounting to 27 lakhs were sanctioned for the Kussoor and Sobraon Branches, on which great progress has since been made. Above 200 miles of canal are already open. The Kussoor Branch is to be 90 miles and the Sobraon Branch 64 miles long. The total length of the main canal and branches, when completed, will be over 350 miles.	29,28,733	2,88,253	4,56,800	6,36,404
Western Jumna Canal.—This project which has been estimated to cost 150 lakhs, has just been under consideration by the Government of India. The works consist of the rectification of the existing line of canal, the addition of new branches* with some navigable channels and the provision of proper drainage. The entire scheme has been referred to Her Majesty's Secretary of State for India for approval and sanction.	5,89,196	12,788	48,022	1,89,766

	Probable cost.
* The Hansi	Rs. 28,84,488
And the Sirsa ...	„ 43,71,667
Sirhind Canal.—This canal is taken out from the Sutlej, and is estimated to cost upwards of two millions sterling. In June 1870 estimates amounting to 87$\frac{1}{2}$ lakhs of rupees were sanctioned by the Secretary of State for the first 37 miles of the canal, the progress in the excavation of which has been satisfactory, as also on the preliminary works and on the buildings necessary for the shelter of all engaged on the works. On this canal prison labour has been employed with advantage. Nearly 1,000 prisoners have till now been engaged and their number will shortly be increased to 3,000. Satisfactory progress was also made in lining out further sections of the canal.	...	1,27,465	2,96,318	3,22,219

OUDH.

An expenditure of Rs. 2,56,188 has been incurred in this Province chiefly on preliminary operations connected with the projection of a canal from the River Sardah. The detials of the project are now under the consideration of the Government of India.

CENTRAL PROVINCES.

In the Central Provinces a scheme of irrigation from the Kanhan River has been projected, estimated to cost 72 lakhs of rupees, and is also now under consideration. This project will provide for the irrigation of a highly fertile extensive and well-populated tract of country, and for a supply of water to the city of Nagpoor, and to the important cantonment (and grain mart) of Kamptee.

BRITISH BURMAH.

In British Burmah an extensive system of embankments for the protection of the country from inundations is in gradual process of construction. The expenses will be recovered from the lands which will be brought under cultivation in consequence of the works.

AJMERE AND MYSORE.

In Ajmere and Mysore the restoration of numerous existing tanks, which have been allowed to fall into decay, is to be gradually carried out.

F. H. R., 4-9-71.

Flood in the Ravee in July last, and its effects on Canal Works.

From LIEUTENANT-COLONEL J. CROFTON, R. E., Joint Secretary to the Government of the Punjab, Public Works Department, Irrigation Branch, to the Secretary to the Government of India, Public Works Department,—No. 22 C—I, dated Murree, the 11th September 1871.

I AM desired to forward, for the information of the Government of India, the annexed copies of reports on an extraordinary flood which occurred in the Ravee on the 23rd July last, and its effects, so far as can at present be ascertained, on the canal works.

2. A similar flood occurred on the 23rd July 1869, which was reported in this Office No. 3309, dated 1st September of that year, but, though not so high as that now reported, was more injurious in its effect from the great length of time the water remained at a high level. That flood lasted for upwards of 48 hours, while six hours appears to have been the maximum duration of the latter.

3. The river gauge at Shahpoor (at the hills 5 miles above the canal head works) stood 2 feet higher than in the flood of 1869 and one foot above the highest reading ever recorded, that of August 1867.

4. The new masonry dam across the river had been completed, as well as the inlet on its left flank to supply the canal channel, before the commencement of the present rains; but as the masonry of the latter especially was still green, it was deemed safer not to use it for a time, and the supply was maintained, as hitherto, through an opening in the old permanent boulder embankment above the new head works. This embankment was constructed at the commencement of the canal works 20 years ago, and until this year had never been topped by a flood. This time, however, the water poured over it and carried away a large portion of the upper part. Timber in much larger quantities than in 1869 passed down both over the new weir and on to the old head works.

5. The damage done is trifling compared to that of 1869. The old head works stood well, the only injury to them being the cutting away of a portion of one of the dam piers down stream, and the breakage of one of the gates of the regulating bridge. Through the bay thus opened, many logs found their way, and, in their passage down the canal, damaged four of the rapids.

The injuries to the new weir, so far as they were visible above water, are described in the Superintending Engineer's reports. About half the piers in the flank openings were carried away; those of the canal inlet were very slightly injured.

6. Since these reports were submitted, I have heard from the Superintending Engineer that, so far as could be ascertained since the flood subsided, the new weir itself seems to have sustained no injury whatever, with the exception of the loss of the piers above-mentioned.

The portion of the river bed, which was deepest before this flood, appears to have partially filled up.

He further mentions that the river gauge at Sidhourie just above the canal supply head stood 3 feet higher than in the flood of 1869; and that the boulder embankment, which was breached, was made 1½ feet higher than the highest flood ever known up to that time.

7. The results in the case of the new weir are most satisfactory, as it was an experimental design, and the masonry was only completed just before the commencement of the present rainy season.

To clear away the immense accumulation of timber at the head and upon the damaged rapids, it was necessary to shut off the canal supply for some days. The water was turned in again on the 8th, and full supply on the 9th August 1871.

8. Major Earle's report concludes with a mention of a gallant rescue of several Natives, women as well as men, from a watery grave by Mr. Supervisor Francis and some of his men. It was done at the risk of their own lives, and well deserves commendation, not only from the Government, but from the community in general.

From MAJOR E. S. EARLE, Superintending Engineer, Upper Baree Doab Canal Circle, to the Chief Engineer and Joint Secretary to the Government of the Punjab, Public Works Department, Irrigation Branch,—No. 2429½, dated Madhopoor, the 30th July 1871.

I HAVE the honor to report that a flood of unusual magnitude occurred in the Ravee on the 23rd instant, by which much damage has been done to the canal works, and the canal itself for the present closed up by the immense accumulation of timber at its head.

On the morning of the above day the height of water at Shahpoor was 10·6, and having increased to 12·5 by 11 A. M., the gates of the regulator were closed, and those of the dam raised to pass off the flood, when at noon the river suddenly rose to an extraordinary height bringing down large quantities of timber with it, and overtopping the Sidhourie bund, brought the whole straight down on to the dam down the head channel, where the logs, some of which were of immense size, soon stopped up the openings of the dam, and began to accumulate to an alarming extent in front of it and the regulator. The water in a very short time rose to the level of the roadway of the dam, and great fears were entertained that this work must give way against so very great a pressure, so much so that preparations were made to cut a channel on the extreme right of the dam in order to let the water round and relieve it. This, though commenced, had not to be carried out as the river began to subside as rapidly as it had risen, and by 2 P. M. all anxiety for the safety of the dam had ceased.

By Captain Palmer's report on the flood of July 1869, I see that the river at Shahpoor rose to a height of 16·6 feet, and that the water at the dam was headed up to within 2 feet of its roadway. On this occasion the maximum height at Shahpoor was 18·5 feet, and 2 feet higher at the dam. The present flood therefore is not only a much greater one than that of 1869, which did so much damage, but the quantity of timber brought down by it is, I am informed by those who also witnessed the previous flood, much greater. It extended from the extreme right of the head channel in front of the dam to 100 feet in width above it, and from that point continued in a curved line to about 70 feet beyond the corner of the spur of silt opposite the regulator, and was packed as close as it possibly could be in the space between this line and the face of the dam and regulator, covering an area, as roughly calculated by me, of 107,000 superficial feet. The average depth of the timber being at least 6 feet, some idea may be formed of the great mass which was collected in front of the head works.

Having heard of what had occurred late on the evening of the 26th instant, I laid my dâk very early on the following morning, and leaving Dalhousie that day reached this early on the morning of the 27th. On my arrival I found the greater portion of the timber in front of the dam had been already got rid of; but the more difficult task of removing that in front of the regulator remaining, for the river had gone down, and that left was high and dry on a heap of silt and rubbish. The work of removing this is being steadily carried on; but little

can be done except when freshes occur, and assist in carrying off the logs as they are rolled down to the waters edge, for most of these are too heavy to be actually taken out, as may be seen by the dimensions given in the margin of some of the largest of these logs. Up to this time the whole of the timber in front of the dam has been cleared away, and a good portion in front of the wall connecting the dam and regulator, perhaps two-thirds of the whole that had collected, but that which remains will certainly take twice as long to remove, unless a flood should occur, and either carry it off or remove it from its present position to that of front of the dam.

Length.	Girth.	Length.	Girth.
22′	19	16′	10
16′	16	18′	20
18′	16	23′	12
16′	18	27′	12
30′	13	25′	12

The following damage has been done by this flood. The river having taken a set in towards the left bank at Shahpoor, has carried away the head of the Shahpoor water-course.

The Sidhourie bund has been carried away almost entirely, and about 700 feet in length of the upper portion of the head channel bund.

Of the 16 piers of the new weir, No. 1 (on the left), though still standing, has been knocked off its base, and must be taken down. Piers Nos. 2 to 9 and No. 11 have been entirely destroyed, and Nos. 10 and 12 partly so, their upper halves being knocked away. The remaining four on the right, Nos. 13 to 16, are but slightly damaged.

The piers of the inlet are also but little damaged, merely having had their upper corners broken off by the logs. This inlet was closed up by a strong boulder bund chiefly to prevent any logs coming fast turning down in towards the canal. Had there been a free rush of water through it, its piers, which like those of the weir are but 7½ feet in length, would certainly have been broken down, as they would have been taken on their sides, and therefore would have had a less chance of resisting the logs. A small portion of the inlet bund did give way, but not sufficient to admit of any harm being done by the logs.

At present it is difficult to tell how the weir itself has fared. The deep portion on the left has silted up about 3 feet, thus bringing it on a level with the rest of the weir, and the greater portion of the river is at present going over it towards the right bank along apparently its former deep channel, and where it has the appearance of having cut back to the weir, though the crest so far seems safe; but should the lower portion of the weir prove to have been cut up too, the crest must necessarily soon follow.

On this point a further report will be sent as soon as any reliable information can be obtained.

The only damage done to the dam is that one of its piers has been cut into on the down stream side, and will require underpining.

The regulator has not in any way suffered, except that one of its gates was broken in two, through which many logs got into the canal and also much silt.

In the canal itself, rapids Nos. 7, 8, 10, and 11 have been damaged, a portion of their beds having got torn out, caused by the logs which came down into the canal through the broken gate of the regulator. The two former have about 900 superficial feet of their rapids taken out in each to a depth of 3 feet, have about 1,300 superficial feet of rapid out and some of it to a depth of 8 feet, while No. 11 which is the most damaged, has about 2,300 superficial feet out, and portion of it to depth of 10 feet.

I regret to have to report that during this flood four Natives lost their lives, and that two of these were men employed in passing on the timber which had collected at the piers of the new weir before these gave way. On the piers beginning to go, some of the men employed managed to get back safely on to the bank before they fell, but others were carried away on the logs. All, except one man, who was carried straight away and was not again seen, got drifted on to an island of silt not far off, where some men and women already were, who had gone out to collect sticks and chips of wood, and had been cut off from returning by the rising of the river.

Mr. Francis, Supervisor, Special Works Division, on seeing the danger that these people were in, put off to their assistance on a "darey"—"drai," or raft of mussuks. On getting out to them he sent back on the "darey" the women first, four in number, and these were safely taken across; but on the darey-men making a second attempt to get out to the remainder (Mr. Francis and seven men), they did not succeed in landing, and were taken down the stream a great way, and before they could return the island of silt began to get washed away by the rising water, those on it then had to take to the logs and were all swept down the stream. Fortunately, Mr. Francis, who deserves very great praise for the brave manner in which he risked his own life to save those of others, was, with four others, saved, but the remaining three men were, I regret to say, drowned, making a total loss of four men.

Memorandum from MAJOR E. S. EARLE, Superintending Engineer, Upper Baree Doab Canal Circle, to the Chief Engineer and Joint Secretary to the Government of the Punjab, Public Works Department, Irrigation Branch,—No. 2459, dated the 5th August 1871.

HAVING inspected the new weir works on the right bank of the river on the 2nd instant, the quantity of water in the river not allowing of this being done earlier, reports that the following damage is found to have occurred by the late heavy flood:

No. 1 spur of dry boulder has been entirely swept away.

No. 2 spur has had about 80 feet of its length cut through in the middle, only about 20 feet of it remains on the side next to the bank.

No. 3 has been turned and cut down to its base. This is an old bund, and up to this has stood well.

The abutment with its continuing bunds, also of dry boulder, is not injured in any way.

The pitching of the sides of the gap left in the down stream bund is perfect, showing that ample water-way has been provided for the stream which passes through it.

A small stream of water now passes all along the length of the upper bund of the abutment, and as the right bank of the river is merely low rise ground formed of a deposit of mud 4 feet in depth on boulders, it will require careful watching, and means taken to prevent the river cutting further into it, and perhaps out-flanking the weir.

The old deep channel of the river appears to have silted up to some extent, and a wider main channel formed more to the left of it. Over the portion of the weir, water is passing as over a rapid of gentle slope, but it is going over with great velocity, and much agitation at about the tail of the weir. Beyond, it flows over without giving any signs of an obstacle beneath it.

Further on to the left, the stream is divided up by low sand banks, but the weir itself is everywhere submerged from abutment to abutment, and its condition cannot therefore be reported on from observation.

The deep portion of the weir, 300 feet at extreme left, is silted up quite to a level with the rest of it, while the silt in the river above this portion is higher still, so that little is passing down on this side of the weir, whereas over the portion nearer to the right abutment a very large quantity of water is passing over, and unless the river rises, bunds will have to be made to bring water across for the supply of the canal.

A great deal of timber still remains to be removed from the head of the regulator, but at latest that by Saturday or Sunday next sufficient will have been got out to admit of a supply being sent down.

Rapids Nos. 7 and 11 have been repaired, and Nos. 8 and 10 will be ready by Saturday evening at latest.

Mr. Cotton, Executive Engineer, and Supervisor Kates, of the 1st Division, have been ceaseless in their endeavours to hasten the re-opening of the canal, and have been well assisted by Mr. Neilly and Supervisor Francis, of the Special Works Division.

From the Government of India, Public Works Department, to the Joint Secretary to the Government of the Punjab in the Public Works Department, Irrigation Branch,—No. 544 I, dated Simla, the 25th September 1871.

YOUR letter No. 22 I of the 11th instant, and enclosures, reporting the occurrence of an extraordinary flood in the Ravee on the 23rd July last, and its effects on the canal works, have been laid before the Governor General in Council.

2. In reply, I am to express His Excellency's satisfaction that so little injury has occurred to the works, notwithstanding the unprecedented character of the flood to which they were exposed, and to convey His Excellency's appreciation of the gallant conduct of Supervisor Francis in rescuing the lives of several Natives on the occasion.

3. The papers will be published in the *India Gazette*.

GOVERNMENT OF INDIA.

HOME DEPARTMENT.

Discipline and management of Prisons in Her Majesty's Colonial possessions.

Copy of a circular despatch addressed by the EARL OF KIMBERLEY, to the Governors of Colonies,—dated Downing Street, London, the 15th April 1871.

I TRANSMIT to you copies of a paper presented to Parliament, containing further correspondence respecting the discipline and management of prisons in Her Majesty's Colonial possessions.

This is the third series of correspondence presented to Parliament arising out of the digest and summary relative to Colonial prisons which accompanied the Duke of Buckingham's circular despatch of the 18th of June 1867.

That digest embodied in its second part an able and succinct statement of the chief conclusions drawn from the experience of this country and of others in the management and discipline of prisons. The papers now enclosed, as well as those enclosed in Lord Granville's circular despatch of the 28th of June 1869, show the progress which has been made in the several Colonies to which they relate in giving effect to the principles laid down in 1867, and it may be convenient that I should shortly review the results of Colonial experience as modifying or confirming rules grounded solely or chiefly on English experience.

I.—As to prison diet, the result of the correspondence which has passed is, I think, that while it does not conflict with the opinion expressed in the digest (page 75), that "hard fare ought to be made an instrument of punishment," it very much strengthens an opinion previously expressed in the same document (page 73), that "the proper amount and nature of prison diet is, more than any other part of prison discipline, a local question." The constituents of diet vary, of course, in different countries, as well as the climates and races of men, and equivalent measures of nourishment can be only approximately reached. But apart from the differences thence arising, you will find, on examining the correspondence, that nothing in it is more remarkable than the difference of the conclusions arrived at on this subject by well-informed and intelligent authorities under conditions to all appearances substantially the same. Thus, while the Inspector of Prisons in Antigua (Parl. Paper, 1870, page 21), considers the negro prisoners of that island overfed on a diet which is equivalent to 176 oz. of white bread a week, the authorities of Mauritius, both civil and medical (Parl. Papers, 1868, page 84, § 21), do not consider as excessive a scale of diet equivalent on the average to about 250 oz. of bread a week. The difference of constitution between negroes and coolies cannot account for this divergence, and, indeed, might have been expected to bear the other way.

While, therefore, Her Majesty's Government continue to regard as highly important the principle of making hard fare a material element of prison discipline, they are not to be understood as aiming at uniformity on the subject, or as advising the indiscriminate adoption in the Colonies of rules founded solely on English experience. They recommend, however, a close and careful attention to the considerations having a general applicability, which are set forth at pp. 73-6 of the Prison Digest, Part II. (Parliamentary copy), and the regulation in each case of diets by the results of practice and cautious experiment.

II.—With respect to classification, I have to call your attention to an error not unfrequently committed in classifying prisoners according to the technical designation of their offences, as felonies or misdemeanours. It was in pursuance of no defined system that crimes which had previously been misdemeanours, or had not been offences at all, came to be included amongst felonies. Some comparatively trivial offences are classed as felonies, and some grave crimes (as, for example, perjury and misappropriation of trust money) are misdemeanours. I speak of the law as it is in England, and I am not aware that in the Colonies, where English law is in force, the division has been made more systematic. It will be found preferable that offenders should, as a general rule, be classified rather by the nature and measure of the sentence than by the legal term for the offence.

III.—In the prison correspondence there has been some denial of the expediency of applying the separate system to uncivilized or semi-civilized races. But I may refer to the decided opinion of Governor Hincks, as quoted at page 79 of the Prison Digest (Parliamentary copy) in its favor. "Real solitary confinement," he writes, "would produce the same effect on a black as on a white man;" and, independently of Sir Francis Hincks's high reputation as a Colonial Governor, his opinion on this question is of peculiar weight, as the penal settlement of British Guiana afforded him experience of the separate system on a large scale, unattainable elsewhere, I believe, in the tropical colonies. Mr. Longden, also, now Governor of Trinidad, writing from British Honduras, on the 22nd of January 1870 (Parl. Papers, 1870, page 4),

speaks of solitary or separate confinement as a more salutary punishment than corporal punishment, and (according to his experience in Dominica) the only punishment prisoners really fear. Whatever may be the value of the considerations urged against the separate system, the following passage from a report of a Committee of the Legislative Assembly of New South Wales points at evils in the associated system which would go far to determine the question between the two systems. "The brutalizing effect" (of association) "upon the prisoners is admitted by all, and it is described by some as terrible in depravity. Practices grossly obscene are common, and on evidence possessing the consistency of truth, and which your committee do not feel warranted in doubting, unnatural crimes of the deepest dye are committed. The clergymen in attendance complain that as the men are never alone for a single hour during the whole time of their sentence, they literally have no opportunity for the exercises of religion, even if they are so disposed, and similar complaints are made by the men themselves" (Parl. Papers, 1868, page 102). This is written of men of European origin, but I am not aware that such things are less to be apprehended amongst depraved men of other races.

IV.—On the point of hard labour the tenor of the correspondence goes strongly to confirm the opinion expressed in the digest, and constantly reiterated by my predecessors and myself, that it is a mistake to sacrifice such efficacy of punishment as can only be obtained by penal labour, that is, labour by treadwheel, crank, or shot drill, to any consideration of the immediate profit to be derived from the industrial labour of prisoners. The reports from the Governors of those Colonies in which penal labour (as above defined) has been introduced are uniformly in its favour. For instance, a Board composed of the chief public officers in Sierra Leone, in a letter of the 27th of September 1869 (Parl. Paper, 1870, page 37), reported very strongly as to the deterrent effect of even a short term of labour on the treadwheel. The administrator of St. Lucia, in his Blue Book Report for 1868, mentions that in the first year after the introduction to a limited extent of shot drill, the committals fell off from 592 to 291. In the Colony of Ceylon (where the reform of prison discipline has been carried through with conspicuous ability and zeal by a Commission comprising the Chief Justice and other highly qualified public officers) the effect of shot drill and hard fare was reported, as far back as June 1868, to be that a sensible diminution had taken place in the number of habitual criminals; that the fear of shot drill and penal diet was deterring the ill disposed generally from crime; and that the Judges had felt themselves justified in greatly diminishing the scale of their sentences (Parl. Paper, 1870, page 56). In Antigua the effect of an increased severity of discipline (which does not appear to have included the *general* adoption of shot drill) was to reduce the committals from 822 in 1868 to 647 in 1869, about 26 per cent.; and of this reduction of 175, the diminution of re-commitments amounted to 150 (Parl. Paper, 1870, page 21).

I need not enlarge upon the significance of these facts. You will find in the correspondence that objections to strictly penal labour sometimes proceed upon the supposition that it is intended absolutely to supplant industrial labour. This has never been recommended by Her Majesty's Government, except in the case of short sentences. And wherever the labour of the prisoners can be utilized by means of the crank or wheel without removing them beyond the precincts of the gaol, those forms of penal labour are obviously to be preferred to shot drill.

I have thought it desirable thus to draw your especial attention to some of the questions raised in the three sets of correspondence with the Governors of Colonies on prison discipline, which have been successively laid before Parliament since 1867 and transmitted for your information; but the experience obtained in the Colonies and represented in the correspondence forms an important addition to that of this country, and I recommend the study of it to the Governors of Colonies and to others concerned in the management of Colonial prisons. Attention to the results of these extended inquiries will prevent the undue over-ruling of generally approved principles by mere individual opinion, at the same time care should be taken to note the instances in which further experience, or local circumstances, point to a modification of the existing system.

I request that you will furnish copies of this despatch to such public officers in the Colony under your Government as are connected with the administration of prison discipline.

Medal presented by the Royal Humane Society, London, to Hookum Ally.

From Her Majesty's Secretary of State for India, to His Excellency the Right Hon'ble the Governor General of India in Council,—No. 33 (Judicial), dated India Office, London, the 30th August 1871.

At the request of the Committee of the Royal Humane Society, I have great pleasure in forwarding the accompanying "Vellum Vote" and silver medal of the Society, for

presentation to Hookum Ally, a mounted constable of the Saugor District Police, in recognition of his gallant conduct in having on two different occasions rescued a boy and man from drowning.

2. The particulars of these cases were sent to the Society by Colonel H. D. Taylor, Inspector General of Police, and I desire that the presentation to Hookum Ally may be made in as public a manner as possible to mark the sense entertained by Government of his courage and humanity.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Proposed introduction of the Cochineal Insect into Mysore.

From Captain T. G. Clarke, Officiating Secretary to the Chief Commissioner of Mysore, to the Secretary to the Government of India, Foreign Department,—No. 2008—75 R, dated Bangalore, the 20th July 1871.

In forwarding, for submission to His Excellency the Viceroy and Governor General in Council, the accompanying copies of correspondence as per margin, relative to attempts that have been lately made by Lieutenant-Colonel Boddam, under the orders of Chief Commissioner, for the introduction of the cochineal insect into Mysore, I am directed to state that Colonel Meade has satisfied himself that, so far as can be ascertained, the conditions as regards climate, temperature, and the cactus on which the insect subsists, are favorable to the success of the experiment, and that he deems it of very great importance to the interests of the Province that the measure shall, if possible, receive a fair trial.

Letter from Lieutenant-Colonel Boddam, with two enclosures, dated 17th July 1871.
Letter from Lieutenant-Colonel Boddam, with one enclosure, dated 17th July 1871.

2. Till within the last few years a large proportion of the lower class of Mahomedans residing in Mysore have maintained themselves by the cultivation of the silk-worm; but the disease that has here become chronic amongst these insects has at length completely destroyed this branch of industry, notwithstanding the efforts made for its recovery by the Government by the importation of fresh stock from Japan, and other means.

3. The cultivation of the cochineal would, if successful, probably be found specially suitable to the class that has thus been deprived of its natural means of livelihood, and most of the members of which appear to be incapable of turning their attention and energies to agriculture or other employment; and as Colonel Boddam has failed in his efforts to procure a supply of the cochineal insect from Teneriffe, the Chief Commissioner ventures to solicit the assistance of Government in obtaining the same, if possible, through Her Majesty's Secretary of State for India, the cost of course being borne by the Mysore Government.

4. In connection with this subject, I am directed to solicit attention to Colonel Boddam's suggestions for improving the plant cases referred to by him if used for the conveyance of cochineal insects for the purpose proposed in this letter.

5. Should it be the wish of His Excellency in Council that such matters in connection with Mysore should be referred direct to the new Department for Agriculture, instead of to your Office, I am directed to solicit the favor of instructions on the subject.

From Lieutenant-Colonel E. Boddam, on special duty, to the Officiating Secretary to the Chief Commissioner of Mysore,—dated Bangalore, the 17th July 1871.

I have the honor to state, for the information of the Chief Commissioner, that I have received no replies from Mr. Campbell, of Santa Cruz, Teneriffe, to my applications for cochineal insects, and would, therefore, venture to suggest that the Government of India be moved to apply for the aid of the Secretary of State in procuring the insects. A copy of my memorandum on cochineal culture, which is to form portion of my agricultural report now nearly completed, is forwarded as showing exactly how the matter stands at present.

Memorandum by LIEUTENANT-COLONEL E. BODDAM, on special duty.

SERICULTURE, which was carried on to a great extent in the neighbourhood of Bangalore and adjacent Districts, has fallen off greatly owing to the disease among silk-worms, and the people following the trade have been mostly ruined. I suggested that cochineal culture should be attempted as a substitute, being easy, light work, fit for the class of men, women, and children who tend silk-worms.

Brazil and Mexico have always largely supplied Great Britain with cochineal; of late years it has been extensively cultivated in Madeira and the Canary Isles, as well as in Spain. During the year 1870 many new plantations were established in Teneriffe and the neighbouring isles, in all of which the cultivation is proving most remunerative, a large amount of capital being thus employed, and so large are the profits (25 to 30 per cent.*) that every available piece of land was being laid under cactus cultivation for production of cochineal to the exclusion of all other branches of field produce. I put myself in communication with Mr. Grattan, Her Majesty's Consul at Santa Cruz, Teneriffe, who sent me a treatise he obligingly prepared for me† on the culture of cochineal there,—see paper attached. One hundred years ago the Hon'ble Court of Directors attempted to introduce cochineal culture in India, and offered a reward of £2,000 to any one successfully importing it. In 1795 a naval officer secretly imported some cochineal insects from Brazil, which were distributed over India and cultivation fostered by the Court of Directors. After expending two lakhs of rupees it was discovered that the wrong insect had been got. There are two sorts of cochineal insect,—the Silvestre or wild one, the *Grana-fina*, or domesticated one, the latter only producing the cochineal of commerce. It unfortunately was the Silvestre that had been imported, and was not worth the trouble of cultivating. The *Grana-fina* has never been successfully imported. From time to time desultory attempts to bring it to India have been made, but I can hear of but one since the invention of Wardian cases, which have done so much to facilitate the transmission of plants from one country to another. Two years ago a young gentleman brought some cochineal insects alive to Bangalore from Kew, but he had no cactus to feed them on and they died. Whether they were the *Grana-fina* he did not know. Besides getting the true insect, the proper cactus for their support is necessary; the common *opuntia ficus indica*, or prickly pear, will not suit the domesticated kind. It must be *opuntia cochinellifera* or *opuntia tuna*. Referring to Kew as to the correct cactus, authorities differed; there appears great confusion in the botanical nomenclature of the cactus family. After much correspondence this point was settled, and I got the true cactus *cochinellifera*; compared the plants so named growing at the Botanical Gardens in Calcutta, Madras, and Bangalore, and found them identical, corresponding with the description of cactus at Teneriffe.

* See end of Consul Grattan's report on cochineal.

† Forwarded to me by Her Majesty's Foreign Secretary, Downing Street.

A mass of information on the original and subsequent attempts to introduce cochineal insects into India will be found recorded in the 6th Volume of the Transactions of the Agri-Horticultural Society of India, A. D. 1839, Appendix, pp. 1 to 111.

The climate of this part of Mysore seems much like that of Teneriffe; we have a mild rainy season and no extremes of cold and heat as in other parts of India. The flora of Brazil and Mexico do remarkably well at Bangalore. The cactus grows without trouble.

From LIEUTENANT-COLONEL E. BODDAM, on special duty, Bangalore, to the Officiating Secretary to the Chief Commissioner of Mysore,—dated Banagalore, the 17th July 1871.

IN my memorandum on cochineal insects I referred to Mr. Bull's plant cases. I have now the honor to forward drawings and specifications of his patent. One of these cases was sent with Lieutenant-Colonel Sankey full of plants to Melbourne to the Superintendent of the Government Gardens there, who reports that every plant arrived safely without a single failure. I had made a few improvements in the case which I will mention below.

It is well known to all cultivators acquainted with the conditions of plant life that those sent in Wardian cases on long voyages suffer more than from any other cause, from the excessive amount of condensed moisture in the cases. This steaming heat Mr. Bull has made efforts to obviate in his patent case, but only partially so. If precautions are so necessary for the preservation of plants from this condensed vapour, it will be doubly necessary to successfully transport delicate insects like cochineal living on the cactus.

Having once fixed themselves on the cactus leaf they never quit their position; they cannot shift from an exposed to a shady side of the plant; they must not be exposed to a broiling sun. Therefore, in any case made by Mr. Bull, or after his plan, I consider it will be

necessary to make the following alterations, which have proved so useful in the case of plants sent to Melbourne:

1*st.*—One or both of the glass sides as well as the louvre shutters should be made moveable, to slide and admit light and air in fine weather, to be fastened by thumb-screws.

2*nd.*—The cap should also be fastened down by the same means so as to be left off in fine weather, but as screws are liable to get loose from the incessant motion of the vessel, I would have a stout flat bit of India-rubber nailed tightly at each end and fastened to the case.

3*rd.*—Instead of iron handles I would have strong screwed wooden block handles with ropes, which would brace the case ends inwardly, and admit of greater power with proportionately less risk in lifting the heavy case from the ship's deck by machinery or by hand.

4*th.*—A short sharp iron peg fastened in the centre of each foot of the case would enter the wood of the deck on which it stands and prevent it moving when the ship rolls. The openings for ventilation recommended by Mr. Bull should be closed with perforated zinc netting to prevent cockroaches getting into the case; on one occasion when cochineal insects were shipped in a case, some cockroaches were let to get in and devour the cochineal insects.

Letter H, in the drawing, figures 1 and 2.

I have had considerable experience in Wardian cases and corresponded with many plant importers and can confidently recommend the above suggestions.

No. 317 A, dated Simla, the 12th September 1871.

Endorsed by the Foreign Department.

TRANSFERRED to the Department of Agriculture, Revenue, and Commerce, for disposal, with an intimation that the Chief Commissioner of Mysore has been instructed to address that Department direct on similar subjects.

CANARY ISLANDS.

Report by MR. CONSUL GRATTAN *on the method of rearing cochineal in the Canary Islands.*

THE cochineal insect is a species of coccus about the size of a pea; it has a silvery grey appearance, the body being reddish black and covered with fine white dust. When first brought forth the insect moves about freely, but as it grows it fixes itself to the leaf from which it derives its nourishment. There are several varieties of the prickly pear plant on which the cochineal feeds, but that most generally cultivated for the purpose of breeding is the common hardy cactus opuntii. In a wild state this plant brings forth abundance of fruit, and it formerly supplied one of the principal articles of food to the inhabitants of the Canary Islands. The fruit is found to debilitate the plant when used for the purpose of rearing cochineal, it is therefore carefully removed as fast as it buds. The cactus plant is so hardy as to grow luxuriantly on rocky spots, where there appears to be scarcely soil enough to fill the crevices; but in this state it cannot serve for the rearing of cochineal for more than one or two seasons. In rich soil, and with abundance of manure and water, the same plants will continue to yield excellent crops for from 10 to 12 years.

The best soil is that which is found in volcanic countries, where pumice stone and black scoria abound. Where no artificial irrigation can be obtained, a layer of black scoria called here "picou," covering the ground to the depth of several inches, is found greatly to improve the plant, by retaining the moisture of the soil and protecting it from the heat of the sun, and also by preventing the growth of weeds, thereby keeping the land constantly clean. In those parts of the Canary Islands where the soil has been overrun by lava, and on which the vegetable growth is confined to lichens, mosses, and here and there small ferns or weeds, the preparation of the land for the cultivation of the cactus is a long and costly process. The rocks and stones which cover the surface being removed from a given space, the earth and mould buried beneath them is carefully collected into a mount; the rubbish is then replaced forming a flat surface, and the earth is spread on the top to the depth of at least three-quarters of a yard. The expense of this process varies according to the hardness of the rock, to the abundance of sub-soil, and to many other circumstances. When the lava streams of older date, and the crumbling action of the elements has softened and rendered the stone porous, the mould beneath being found in sufficient abundance; the average cost of preparing the land for cactus planting is about 90*l.* to the acre. Where there is abundance of

earth on the surface, and the preparation consists only in levelling the ground for the facility of planting and of irrigation, the cost is much less; but a thorough upturning and airing of the soil is found to be essential to the successful cultivation of the cactus. The cactus plant is propagated by the leaves, which should be broken off sharply one at the time, and be exposed to the heat of the sun for about three weeks before they are planted; if the leaf is put into the ground fresh and moist as at first gathered, it is almost sure to rot; but when laid in the sun and allowed to dry until slightly bent, it will strike root and bud with the greatest facility. During the summer months, leaves so dried will be found to bud in ten days or a fortnight with great profusion, as many as eight or ten new leaves bursting forth at the same time. The leaves should be planted in furrows at about a yard apart, either edgeways, as close as possible, or about four inches apart if placed across the furrows. This plantation being made in May or June, the new leaves will have grown to their full size in four or five months, and the plants will then be ready for transplanting into the ground to be finally allotted to them. Here the furrows should be at least two yards apart, in order to admit of a free passage to the labourers amongst the plants after they have grown to their full size; and each plant should be placed in the furrow at half a yard from that on either side of it, in order to allow sufficient space for their full development, which will take place in the month of February or of March. Each leaf buds with about from 5 to 15 shoots, according to the nature of the soil and to the quantity of manure and water supplied to it. In handling these plants great care must be taken to avoid bruising the main trunk; if by accident the hoe should be struck against it, the only way of saving the plant is to cut out the injured piece with a sharp knife, the fresh cut will then probably dry, and the plant will be none the worse; a bruise, on the contrary, gradually causes the whole trunk to become soft and putrid. A considerable quantity of ordinary manure or of guano is required to bring the plants to perfection, the latter is dangerous without abundant irrigation, the plants being subject to a peculiar disease when there is not sufficient water to dissolve the guano; but with plenty of water, as much as 20 cwt. of guano can be applied to each acre of cactus plants with the best results. In all cases, however, it is found advantageous to make use of ordinary manure, as well as guano, in order to lighten the soil, which should be thoroughly dug four times a year, and oftener when weeds are plentiful.

Having by these means obtained by the end of May or June well-grown cactus plants consisting of four or five branches, springing from each trunk, with a good supply of rich dark-green leaves, when the fleshy spines and prickles have fallen from them, the plantation is ready to receive the insect. The growers on the south side of the Island of Teneriffe cultivate the cochineal in the winter so as to bring it to maturity in time for the great crop which is planted from the latter end of May to the end of July or August; the insects being carried to the north of the island in boxes supplied with trays, in which they are laid to the depth of two inches. Each box is constructed to hold about 40 lbs., and is carried on a man's shoulders over the mountains during the night, so as to be as little exposed to the heat of the sun as possible. In Grand Canary the most extensive planters reserve a portion of their land for the production of "madres" (or mothers), as will be hereafter explained. The state of the weather during the growth of the "madres" and the temperature at the time of spawning, has so great an effect upon the amount of seedlings produced, that it is impossible to fix the quantity of "madres" required per acre; but for such a plantation, as has been described, about from eight to ten boxes, that is from three to four quintals, would be considered a fair average. The mothers are put into small bags made of a material called "renque" (a sort of gauze), about eight or nine inches long, and shaped somewhat like a sausage, in each of which is put about a table-spoonful of "madres," and then hung over a leaf in the cochineal plantation. The young, as they are born, walk out of the bag on to the cactus, and spread over the surface of the leaf. The quantity of insects spawned in a given time will vary according to the heat of the weather and the age of the "madres;" with fresh "madres" and in warm weather, a couple of hours will be enough to cover the leaf sufficiently, with old "madres;" and in cool weather, the bags may be left on the leaves as long as 30 hours, or even two days; the leaf, on removing the bags, should be moderately and evenly covered with insects. If the insect is allowed to spawn too freely on each leaf, the crop will be damaged in quality, and if the bags are removed too soon, the crops will be deficient in quantity. The obtaining of a fair average number of insects on each leaf is therefore one of the most important points to be looked to in the cultivation of cochineal, and one which requires experience and constant supervision on the part of the grower. There are other ways of conveying the spawn to the leaves; that most in practice is the following: the "madres" are spread on shallow trays which are slid into shelves round a room, each tray being about 4 or 5 inches long and 2½ inches wide; some use them entirely made of wood, others a framework of wood with a bottom of "medio brin," or thin canvas, nailed on so as to prevent the escape of the young. The "madres" being laid thinly over the surface, so as to lie closely side by side, but not one over the other; pieces of rag, about half a yard long by five inches wide, are then spread over the whole surface of the tray; in a short time these become covered on the underside with the young insects, and

being removed are conveyed to the plantation in baskets; they are one by one pinned on to the leaves, on which the young insects soon fix themselves; fresh rags are then laid over the "madres" to be again covered with the young. It is found that white rags are best, black and dark colours are *disliked* by the insect. The same difficulty as to the number of insects conveyed to each leaf, exists in this method of planting as well as in the former with a new element of difficulty, *viz.*, that the production of the young varies with the amount of light admitted into the room. To insure the greatest quantity of spawn in the shortest time, it is therefore necessary to have a skylight to the room, and it is not improbable that the preference for white rags is owing to their admitting more light to the insect. After pinning the rags to the leaves they are left for a longer or shorter time, according to the state of the weather; in fine and warm weather 24 hours will suffice, but when the weather is cold and damp they should not be removed for three, four, or more days. In the winter season the rags used formerly to be left upon the plants until the time for gathering the crops, in order to protect the young insects from the inclemency of the weather, but experience has shown that this object is better obtained by other means. It may be as well to mention here, that for a winter crop the insects should be allowed to spawn far more copiously on each leaf than in summer, as the cold, rain, and winds of that season destroy a great many. When the "madres" have exhausted their powers, which occurs sooner or latter, according to the temperature to which they are exposed, and which is known by the young being born black instead of white, they are collected from the bags or trays in which they have been spawning, and put into an oven for drying. This process, and the treatment used in preparing the "madres" for market, is so similar to that gone through with the full-grown silver cochineal of the principal crop, that both subjects may be considered together. The young insect takes more or less time in coming to maturity, according to the weather. Those planted in June are often ready to be gathered in 70 days, or even earlier, whereas those planted in October and November are not ripe till late in February or early in March. Those planted in the latter season, which are intended exclusively to serve as "madres," should be allowed to ripen thoroughly before they are gathered, and should not be taken off the plant until there are some young to be seen crawling over the leaves. On the other hand, the cochineal planted in March or April for "madres" spawns with such astonishing rapidity in June or July, under the influence of the heat of those months, that, as soon as the first leaf in a plantation which has taken three or four days to cover with insects, is seen to have young upon it, the whole should be gathered, for even those that require some hours before arriving at maturity will ripen in warm weather.

The cochineal planted in June and July being the great crop of the year, prepared principally for drying at once into silver cochineal, should be gathered before it commences to spawn. Thus during August and September the grower watches for the first symptoms of spawning, and as soon as they appear, not a moment is lost in proceeding to immediate gathering, for the weather being then quite as warm and bright as in June, the same rapidity in repening is observable, and the loss of weight is serious if the spawning is allowed to proceed for even a few hours. The proper manner of gathering varies according to the object to which the plants are devoted; but, as a general rule, the leaves on which the bags are placed are sharply cut off with a knife, close to the branches, and the cochineal is swept off then into broad baskets closely woven to prevent loss. After the leaves are all cut off and swept, they are dropped into the ridges, *where they are left*; another set of gatherers carefully scrape off the insects which have passed into the branches or trunk of the plant; leaving even one or two insects on these branches is fatal to the health of the plant, as they spawn, most probably in hidden spots, and shortly afterwards the strength of the branches, which is required to produce new leaves for the ensuing year, is absorbed by the surreptitious growth of insects, and this is fatal to the future crop. It is therefore a most important point to be attended to by the overseer. To prevent any young insects remaining on the plants after gathering, it is necessary to sweep the branches several times every two or three days. By this means such as may escape the first or second sweeping, having both grown and changed their position, will be removed on the third or fourth application of the broom. It must be borne in mind that a small insect will grow in a few weeks into a "madre," and will propagate several hundreds of young which will eventually much weaken the plant. The leaves which have been cut off at the gathering of the crop, should now be chopped up into small pieces and dug into the ground, as they serve to lighten it, and by their fermentation they warm the roots of the plant, and act as excellent manure; guano should also be applied freely. It is found that as much as 15 quintals of guano per 1½ acres can be applied with benefit to the cochineal, a grower at Grand Canary used as much as 25 quintals on one occasion, and was rewarded by a return of from 11 to 12 quintals of cochineal, or nearly double the average crop. To prevent so much guano injuring the plants, artificial watering must be freely resorted to if necessary; a good soaking being given to the ground every three weeks. The cactus cannot bear much water when not strengthened with manure, neither can it bear much manure unless it is copiously watered. When a plantation is reserved for the production of

a winter crop, the leaves should be covered with cochineal in the months of October or November; by planting the young cochineal at this season, it ripens and is ready for gathering at the latter end of February or of March. Another plantation of cacti is reserved for receiving the seed at this season; but as the plants cannot be forced to bud during the winter, the seed must be planted in March upon last year's leaves, which have the disadvantage of being tough for the insect, and this renders a winter crop more precarious than one obtained in summer; however the sale of "madres" in June brings a quicker return than the dry crop of August or September. The wind and rain during the winter months frequently destroy half the crops, and in summer a hot south wind ("levante") will often kill many of the insects. In order to prevent the losses thus occasioned, light covering of cotton gauze is spead over the whole plantation upon stakes and wires, at a height of about 7 feet. Mats have been used for the purpose, and also calico, but these materials are found to injure the insects during the winter by keeping off the sunshine, and in summer by preventing the free circulation of air. Some growers protect the insects by merely throwing mats loosely over the plants when the weather thereatens to be very hot or stormy, removing them when the danger has passed. But these are only makeshifts, and are less efficacious than the first mentioned plan. The evil effects produced by the heat during a south wind in summer may be much diminished by a copious watering early in the morning, for the moisture which evaporates from the wet soil saves many of the insects. As the cochineal is collected, care should be taken that the baskets do not remain long filled, the insects that lie at the bottom being injured by the weight. The person in charge should immediately empty the baskets on receiving them from the plantation, and spread out the cochineal on trays, or even on a sheet on the ground, not deeper than from two to three inches, otherwise the grain will assume a reddish-tinge, which considerably diminishes its value. The cochineal gathered during the day is collected in this way, and towards evening it is put into an oven heated at about 150° Fahrenheit; there it is left for four or five hours, the temperature being carefully kept up; afterwards the oven is allowed to cool gradually until the morning, when it will be found that the insects are still moist. Exposure to the sun for a few days in summer will complete the drying, and it is found that there is less loss of weight when the cochineal is dried in this manner than would occur if subjected to greater heat, or if left a longer time in the oven in order to dry it at once; even in winter many growers prefer to let their cochineal dry slowly in the air rather than by the heat of the oven, the loss of time being of less importance than the loss of weight. Some growers do not use the oven; a table-spoonful of wood ashes is spread over a pound or two of cochineal, it kills it in a couple of hours; the dust and ashes are then shaken off from the grain in a sieve and the cochineal is dried in the sun. Others prepare the cochineal by putting it into sacks in moderate quantities; two men grasp the sacks at each end, and shake the grain briskly backwards and forwards; this process gives the cochineal a brilliant polish, and though less weight is finally obtained from a given quantity of green cochineal, the price it commands in the London market compensates for the loss of weight. But the best processes for preparing this polished cochineal are known only to a few, who keep the secret jealousy; the oven is, therefore, still almost universally used for drying.

After the grain is thoroughly dried, it is well sifted in order to free it from a white powder which to the last clings to it; numbers of prickles which have fallen from the leaves have also to be removed. Excellent machines have been invented for this purpose both in England and America. The cochineal being thus dried and cleaned, it is packed for exportation into bags containing about 150 lbs. each, which are carefully sewn up. This is done by the trader who buys it of the cultivator, the latter rarely exporting the grain on his own account. The results obtained by different growers of cochineal vary so much, in consequence of the peculiar circumstances to which the crops are exposed in different localities, that it is impossible to fix upon the actual value of an average yield per acre; but it is universally admitted by the land owners in the Canary Islands, that no other branch of agriculture is as remunerative. The average temperature in the southern part of the Canary Islands is about 80° to 85° Fahrenheit, and it rarely falls at night below 56° or 60°. At Laguna and at Orotora, and other places in Teneriffe, where cochineal is cultivated at a height of nearly 2,000 feet above the level of the sea, the climate is temperate. The thermometer rising to 72° or 78° in the summer, and falling at times during winter nights to 45°.

In all these places the cactus thrives, and cochineal can consequently be reared successfully.

Rain falls in Teneriffe (more plentifully on the high lands than on the coast) from the month of October to April, often in heavy showers, which continue at intervals for two or three days, these are generally followed by two or three weeks of dry weather. The rains are seldom excessive; the winds rarely amount to gales. From May to October the weather is constantly dry. There are no tables of rainfall during each month to be obtained here.

The following account, showing the amount of the first outlay, and of the annual expenses and profits per acre of a cochineal plantation, has been given by a grower in the middle lands of the valley of Orotora, Teneriffe:

	£	s.	d.
Purchase value of land per acre	50	0	0
* Preparation of land and cost of planting and growing cactus for the first year before receiving the cochineal crop ...	90	0	0
Bags, baskets, and other utensils	10	0	0
First outlay	150	0	0

Annual Expenses.

	£	s.	d.
8 Boxes of "madres" at 2*s.* per pound	32	0	0
Wages for planting, gathering, and preparing cochineal ...	30	0	0
12 quintals of guano at 13*s.* 4*d.* per quintal	8	0	0
Digging, weeding, watering, and general expenses ...	18	0	0
Total	88	0	0

Annual Profits.

	£	s.	d.
50 lbs. of black "madres"	8	0	0
8 quintals of silver cochineal at 3*s.* per lb	120	0	0
Total	128	0	0
Net Profit	40	0	0

The average price at which the "madres" can be obtained varies much at different times falling as low as 9*d.*, and frequently rising to 2*s.* 6*d.* and even 3*s.* per pound.

The management of the insect gives employment to a large number of women; it can almost exclusively be conducted by them. The larger proprietors employ most of their hands during the whole year, so as to command a full number when the labour of the season comes on. The wages of the women in the valley of Orotora is 6*d.* per day, or 3*s.* 6*d.* per week for the best workers. Day labourers receive at the rate of 6*s.* 3*d.* per week for digging and planting, &c., &c. The successful culture of the cochineal requires experience and patient attention on the part of the grower; he will receive his reward by obtaining a return of from 25 to 30 per cent. upon the capital employed.

Teneriffe, 187.

From the Government of India, to Her Majesty's Secretary of State for India,—No. 7, dated Simla, the 26th September 1871.

WE have the honor to forward the papers marginally noted, relative to the proposed introduction of the cochineal insect into Mysore, and to request that your Grace may be pleased to take measures for procuring a supply of the insect from Teneriffe, as requested by the Chief Commissioner in the 3rd paragraph of his letter.

Letter from the Chief Commissioner of Mysore, to the Secretary to the Government of India in the Foreign Department, No. 2008—75R, dated 20th July, and enclosures.

Chanda Iron Ores.

Note on the iron ores at Goonjwai, Lohara and Dewulgaon, in the Chanda District by M. FRYAR, ESQ., *Mining Geologist to the Government of India,—dated the 30th March* 1870.

I. THE village of Goonjwai is 50 miles E. N. E. from Chanda, and the mines or small diggings for iron are one mile South of the village.

* This great expense is caused by the space to be cultivated in this locality being composed of rock and other hard substances, which it is necessary to excavate or to remove, the soil being brought from considerable distances by beasts of burden.

At the foot of a hill, holes from two to six feet in depth have been dug in Moorum or ferruginous earth for small pieces of ore which, from appearance, tell plainly of being fragments of some larger mass. From these diggings, I ascended the hill and found in the ascent, a distance of about 50 yards, that every piece of stone I could pick up from the grass and shrubs of the thick jungle were pieces of weighty iron ore highly magnetic. At the top of the hill the wall of a lode of this rich ore was clearly descernible, consisting of a finely laminated gneissose sandstone, and the lode itself I found to be traceable for about 50 yards and to be full of iron ore in large masses. The Native smelters dig at the bottom of the hill, in order that they may obtain small pieces of the ore and thereby save themselves labor in breaking fragments of suitable size for their smelting furnances.

What I have said about the quantity of ore to be seen exposed is a fact which speaks for itself as to the practically speaking inexhaustible yield to be anticipated. The ore is highly magnetic and is, in my opinion, equal in quality to the rich magnetites of Norway and Sweeden. If so, it is then one of the richest ores that can be met with, and surpasses in yield of metallic iron any ore which has yet been discovered in useful quantity in the mining Districts at Home.

II. Lohara mines are 50 miles North-East of Chanda. Here as at Goonjwai there is a hill of magnetite. Making my way through jungle, I ascended the hill, a distance of about 100 yards, and could find no other stone than pieces of rich magnetite: the "expression" of the place appeared to me to excel that of Goonjwai, as regards the immense quantity of ore easily obtainable.

III. Dewulgaon is 68 miles E. N. E. of Chanda, and is on the East side of the Wyngunga River. Here is a large lode of magnetite clearly traceable for at least 150 yards. The cardinal lode filled up with massive ore is about 10 feet wide, but from this there are many branches, and small pieces of ore are scattered over the country for some acres in extent; it is from these scattered fragments mainly that the supply of ore for the Native smelting work is obtained.

IV. *Remark.*—From the Mayo Colliery to Goonjwai or to Lohara is 65 miles. The roads are good for Native carts, and save during the rains the ore could easily be carted from the mines to the coal at Googoos. Carts regularly engaged in the work of carriage would convey the ore this distance for 12 shillings per ton. To this sum something would have to be added for breaking the ore at the mines and for filling the carts. A very large quantity of ore is obtainable in fragments, and to load this into carts would not cost more than a few pice per ton; but for breaking the large blocks, drilling machinery and blasting would have to be resorted to, the cost for which would, in my opinion, be covered by two shillings per ton. This would make the cost of the ore at Mayo Colliery 14 shillings per ton, or about half of what would be given for this quality of ore at Home.

Report on certain samples of iron ore from the Chanda District, Central Provinces of India, by* DAVID FORBES, ESQ., F. R. S. *&c.,—dated 4th August* 1871.

IN conformity with your request I have submitted the four samples of iron ore placed in my hands to a careful examination, in order to arrive at a correct estimate of their value for iron-making, and, with this object, have made complete chemical analyses of the three samples considered by you as of most immediate importance.

The results of the above-mentioned analyses, when placed in a tabulated form, show the percentage chemical composition of these three iron ores to be as follows:

	I.	II.	III.
	Lohara.	Dewulgaon.	Goonjwai.
Iron, metallic	69·208	70·006	70·134
Oxygen, in combination	29·376	28 670	28·739
Sesquioxide of manganese	0·090	0·084	0·108
Silica	0·823	0·813	0·545
Alumina	0·432	0·387	0·396
Lime	0·054	0 026	0·055
Magnesia	trace	trace	trace
Sulphur	0·012	0·013	0·020
Phosphorus	0·005	0·001	0·003
Total	100·000	100·000	100·000

* Received through Major Lucie Smith.

The characters of the ores are as follow:

I.—*Lohara.*—Very compact crystallized hematite or specular iron, containing some admixture of the magnetic oxide of iron, as was evident from its being in some parts very faintly magnetic. The sample was nearly pure oxides of iron, containing no admixture of rock or other mineral matter visible to the eye.

II.—*Dewulgaon.*—A granular admixture of magnetic oxide of iron with some specular iron ore and rusty oxide, strongly magnetic, and showing no appearance of rock or other admixture.

III.—*Goonjwai.*—A granular mass of crystalline hematite or iron glance, containing some admixture of magnetic oxide and rusty oxde of iron, in parts very faintly attractable by the magnet; free from admixture of stony matter.

IV.—*Ambagurh Chowky.*—A coarsely crystallised magnetic oxide of iron, containing 72 per cent. metallic iron nearly pure, and quite free from other mineral matter, as far as could be detected by the eye.

A glance at the results of the chemical examination of these ores will show that they are not only extremely rich in iron, but also that the amount of the deleterious ingredients, sulphur and phosphorus, contained in them, is the minimum known in even the best iron ores of Sweden and Russia.

The quantity of phosphorus present was so small that it would be overlooked except by employing the most searching tests for its presence; whilst the insignificant percentage, or rather trace, of sulphur would be dissipated in calcining the ores.

These ores resemble strongly some of the very richest deposits of iron ore occurring in Sweden; and if the general mass of the lodes is equal in quality to the samples already placed in my hands for examination, there cannot be, in my opinion, any doubt as to their producing, if smelted on the large scale, an iron equal in quality to the best Swedish or Russian brands so much sought after and well adapted also for the manufacture either of Bessemer or any other variety of steel.

Owing to the density and compact nature of the ores, they should, previous to being charged into the blast furnance, be submitted to a preliminary roasting, or calcination, in order to render them more porous and open in texture, for thereby to facilitate their reduction by the gases of the furnace.

On account of their extreme richness in metallic iron, they are naturally deficient in slag-forming ingredients, and these will consequently have to be added to the charge of calcined ore, either in the shape of a small quantity of poorer ore, or of other mineral containing silica in combination with the earth, in conjunction with the usual limestone (or burnt lime), which, by acting as a flux, will furnish the amount of slag essential in iron smelting to the economical working of the blast furnace.

In conclusion, I would only express my opinion that these ores, if smelted with either charcoal or coal of good quality, are extremely well adapted for the production of first class iron, whether in pig or bar, or intended for conversion to steel.

Report of Rainfall and the state of the Crops in British Burmah, and the Cotton Report of the Cotton Commissioner for the Central Provinces and Berars.

No.	Presidency or Province.	District.	Date of District Report.	Rainfall for fortnight preceding.	Date of message from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
				Inches.			
	British Burmah ...	Rangoon ...	September 27 ...	5·8	September 28 ...	Crops fair.	
		Maulmain ...	" ...	16·65	" ...	One-third of damaged cultivation replanted, but reported not strong and healthy; other crops very good.	
		Akayab ...	" ...	13·6	" ...	Very satisfactory.	
		Thayetmyoo ...	" ...	3·89	" ...	Fair.	

THE COTTON CROP.—The Cotton Commissioner for the Central Provinces and the Berars reports, as follows, by telegraph from *Allahabad on the 29th September*:

"Since yesterday's telegram [published in the Supplement of last Saturday], there has been a complete change here. The rain has quite cleared off with the full-moon, and to-day is bright and cool, something like the commencement of the cold weather."

GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Thursday, the 28th September 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding*.
His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.
The Hon'ble John Strachey.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major-General the Hon'ble H. W. Norman, C. B.
The Hon'ble F. R. Cockerell.
The Hon'ble R. E. Egerton.

LAND IMPROVEMENT BILL.

The Hon'ble MR. STRACHEY moved that the Report of the Select Committee on the Bill to consolidate and amend the law relating to advances of money by the Government for the improvement of land be taken into consideration. He said that this Bill was essentially the same as when it was published some months ago, when it was referred to a Select Committee. But there had been one important change. It was formerly proposed that it should be applicable to Northern India only, whereas the Committee now recommended that it should be extended to the whole of British India.

The Council would remark that the Lieutenant-Governor of Bengal, in a former debate upon this Bill, expressed a wish that it should apply to that Province. The Bombay Government had stated its approval of the Bill, and its desire that it should be extended to the Bombay Presidency. The Madras Government, while retaining the general objections to the measure which it formerly urged, had stated that if the Bill was made applicable to the rest of India, it wished it to be made applicable to the Madras Presidency also. Under these circumstances, the Council would probably have no hesitation in accepting the recommendation of the Committee, and in extending the Bill to the whole of British India.

He need not say much about the objects of the Bill, because they had been fully stated on former occasions. In regard to the main principles of this measure, there was no novelty in it. It was a consolidation of the old taccávi laws, with some important amendments. It ought, he thought, to be remembered to the credit of the British Government of the last century in India, that it recognized by law the principle now acted upon with so much advantage at home, under the Land Improvement Acts, that it was the duty of the State to make use of its resources in encouraging and developing agricultural improvement. The old Regulations for which it was proposed to substitute the present Bill, had not, he believed, in any Province, been applied on any defined and organized system. Their application had mainly depended on the opinions or zeal of individual officers of the Government. Nor would it have been easy to introduce such a system, for the provisions of the existing law were, to some extent, unsuitable and obsolete. For instance, if the law were strictly acted upon, which he believed it never was, they would have to charge twelve per cent. interest on all advances. What they required was a well organized system under which the Government should encourage, by loans granted on the security of

the land to be improved, the construction of simple works of agricultural improvement, such as wells, tanks, minor water-courses, and so forth. The Government was now gradually covering India with great works of irrigation on a scale unknown in any other part of the world, but no proper provision had hitherto been made for the encouragement of the humbler but hardly less valuable class of works to which this Bill referred—works which would be constructed by the landed proprietors and occupiers themselves.

The present measure brought with it no financial risk, and imposed no charges whatever on the revenues of the State. Government would make advances at a somewhat increased rate of interest over that which it itself had to pay, but still at a lower rate than money could be borrowed at from other parties, and he presumed that these advances would ordinarily be made, or might, with perfect propriety, be made from the money borrowed for reproductive works.

Those works would be so simple that there could be no doubt under proper management of their reproductive character. The security for re-payment would, in almost every case, be the land itself on which the improvement was made. He only wished that they had some such sort of local and well-defined security for the re-payment to the State of the charges incurred on the great works of canal irrigation executed by the Government itself. There was no doubt that they ought to have such security, and he believed that at some future time they would get it. This, however, was not a question he need dwell upon now, as it might perhaps, before long, come up for consideration before the Council, when the Canal Bill was being proceeded with.

Hitherto, advances of this character had only been made to the proprietors of the land to be improved. Under the present Bill, advances, under certain circumstances, might also be made to tenants; but the consent (either expressed or implied) of the landlord would be always necessary, unless the Collector should be satisfied that the tenant possessed in the land an independent and transferable interest which would furnish by itself, without reference to the landlord, a sufficient security for the re-payment of the loan.

The Government would make rules as regards all details not expressly provided for in the Bill.

The practice laid down in the old Regulations which had been found perfectly successful in protecting the Government against loss, was also introduced into this measure, namely, that advances would be recoverable as arrears of land-revenue.

He hoped that if this measure became law, it would prove the starting point of a system under which benefits of the greatest possible value might be conferred upon the country.

In conclusion, he had only to say that he desired to thank his Hon'ble friend, Mr. Cockerell, for the very great assistance which he had given in framing and in improving this Bill. From the time when it was first brought forward his Hon'ble friend had taken much interest in the measure, and they had in a great degree to thank him for the satisfactory form in which he (MR. STRACHEY) thought, it was now placed before the Council.

The Hon'ble SIR R. TEMPLE said that he entirely agreed in the remarks of his Hon'ble friend, Mr. Strachey. The Financial Department concurred heartily in the Bill. The advances provided under the Bill would be made, of course, from the cash balances, and the cash balances consisted partly of the results of imperial taxation, and partly of sums raised by loan. Now, how was it possible to spend such balances more properly than in stimulating and assisting agriculture—the only reliable field for taxation? The security for these advances was the best possible—the very land that was to be improved. He agreed that it was highly desirable that similar security should be provided in the case of canals; any such proposal would certainly have his (SIR R. TEMPLE'S) support. As to the rate of interest it would always be such as to fully recoup the Government for all expenses connected with the loan; no fraction of any such expenses would fall on the general tax-payer. In former times some small advances might have been made without interest,

on the principle, he supposed, that land-revenue not expended might, with propriety, be spent on the landowner from whom it was derived. But the principle was one that obviously could not be generally carried out. Those who borrowed should, as a rule, pay interest; and this being so, there was no need for the short periods in which under the old system these loans were re-payable. These short periods had, to a great extent, neutralized the value of the advance, because an agriculturist found himself obliged to repay the loan before he began to reap any advantage from the improvement effected. Now that a man would pay fair interest, there would be no need for any such hurry. It was far better that the people should borrow of Government than from their own countrymen on what in any civilized country would be regarded as exorbitant rates. It was a great duty to encourage saving, and to lead tenants, as well as landlords, instead of hoarding their savings, hiding them in a napkin, melting them down into ornaments, or burying them in the ground, to apply them as capital to reproductive purposes, in compliance with the sound principles of political economy.

HIS EXCELLENCY THE COMMANDER-IN-CHIEF wished to say a few words on a measure which he cordially approved. It was fair, he thought, to credit the officers of the Irrigation Department with the credit of having started the system of Government advances for agricultural improvements. Thirty or forty years ago, canal officers had appreciated the wants of the country in this particular, and had inaugurated the system of advances which he was happy to see was now about to be made the subject of express legislative enactment. It was honourable, he thought, to the Irrigation Department thus early to have recognized and endeavoured to meet the wants of the people in so important a particular.

HIS EXCELLENCY THE PRESIDENT said—"I cannot allow the Bill to pass without expressing my satisfaction at the prospect of its immediately becoming law.

"Ever since I have been in India I have been most anxious that the system under which taccávi advances have for years been made, should be systematized and rendered more beneficial.

"I may say that one reason why I have taken such an interest in the matter as regards India, is that during a great part of my life I have been engaged either in legislation on cognate subjects, or in the direct working of similar laws to that which we are now passing.

"In Ireland a system of Government advances has been in operation for many years to the great benefit of the country. I may say for the satisfaction of my Hon'ble colleague, the Financial Member of Council, that the system has been carried on throughout the entire period of the famine without the smallest loss to the Government, as well as I recollect. From the last returns I see that the sum now advanced is considerably more than two millions, and the arrears of principal and interest amount to something like £550.

"The whole system works like clock-work, with great advantage to the country, and without the smallest risk of present or future loss to the State.

"In England, where it has not been thought necessary to establish a Government system of loans, many Acts of Parliament have been passed to enable private individuals and Companies to carry out almost the same system; and to Companies which make these loans, the same facilities for recovery and the same securities are given as the Government would have thought necessary to enact for its own loans.

"I happened to be connected little with a Company of that kind, and the result was precisely the same as in the case of the Irish Government loans.

"The sums of money negociated were exceedingly large, but the re-payments are made to the day, and I do not believe that the Company with which I was connected had ever to complain of having a single bad account.

"There are several other Companies of the same kind that have been engaged in the same transactions, and, with the exception of some which were not very well managed, the same satisfactory results have generally been obtained.

"It seems to me that such a system which has worked so well in other countries, and which is so well known and has been so long in existence in India, must be an immense benefit to the country, and that if the local Governments take up this measure in the spirit that I have—no doubt they will—it will be found easy to establish a small and inexpensive organization for working the provisions of the Bill in case the district officers have not time to give to it due attention.

"I think in districts where the transactions may not be large, and where the system is well known, it may be found that the district officers can do all that is necessary; but in other districts, where numerous or large works may be desired, and the proprietors are willing to undertake them, that some small special organization may be necessary for a certain class of works, and that there will be no difficulty in arranging for their proper supervision and completion.

"There is only one other remark that I wish to make, and that is, that the Council will perceive the Bill is strictly limited to loans made for agricultural improvements.

"I have heard it stated that, by the passing of this Bill, the Government have announced their intention of withdrawing permanently advances for agricultural purposes that may not strictly come under the head of agricultural improvements. I can only say that this is not the intention of the Government, and it is possible that there still may be certain loans necessary, particularly under pressure of famine and distress, such as have been given in former years under the taccáví system, which it is absolutely necessary that we should make. There is nothing in this Bill to prevent this still being done.

"The whole object of the Bill is to put on a more systematic footing the system of loans for permanent agricultural improvements, which can have no other effect except that of adding permanently to the value of the land and increasing the value of the property.

"I commend this Bill to the attention and consideration of Local Governments, believing that it will not only have the effect of benefiting the people, but it will also bring the officers who are engaged in carrying out its provisions into a most agreeable contact with the people, and increase those kindly feelings which ought to exist between the rulers and the ruled."

The Hon'ble MR. STEPHEN observed, with reference to the observations which had fallen from His Excellency the Commander-in-Chief, that the principle of the Bill was by no means a new one. It had been recognized and acted upon from the early days of the British administration. The present Bill was in fact a consolidation measure, and replaced parts or the whole of no less than ten Regulations which were scattered about the Statute-book in an inconvenient manner, and were, in some instances, not adapted to the present requirements of the country. The Bill asserted no new principle; it merely provided for working the old system more conveniently and efficaciously.

The Motion was put and agreed to.

The Hon'ble MR. STRACHEY also moved that the Bill as amended be passed.

The Motion was put and agreed to.

BENGAL REGULATIONS REPEAL BILL.

The Hon'ble MR. COCKERELL presented the Report of the Select Committee on the Bill for repealing certain enactments of the Bengal Code.

The Council adjourned to Thursday, the 12th October 1871.

H. S. CUNNINGHAM,

Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

SIMLA,
The 28th Sept. 1871.

No. 39 of 1871.

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, OCTOBER 14, 1871.

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GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE AND COMMERCE.

Forests and Water-supply of Algeria.

From the *Revue des Eaux et Forêts* for September 1870.

BEFORE concluding the article which appeared in the number for February last, on the mountain-system and distribution of the forests of Algeria, I think it will be useful to reproduce the following passage taken from an article published by M. Jules Duval in the *Economiste Français*. It is impossible to set forth in a more striking manner the importance of the forests of our splendid African colony:

"Owing to its situation between the 33rd and 37th degrees of north latitude, and its proximity to that great reservoir of torrid heat, the desert of Sahara, Algeria is constantly exposed to burning winds from the south and to prolonged droughts. The greatest risk is incurred by the province of Oran, which is closest to the zone of the desert, owing to the obliquity of its littoral; the risk is less in the province of Algiers, which is better sheltered by the mountains on the south; and is greatly lessened in the province of Constantine, which is further removed from the fiery furnace of the desert, and better defended by the elevated barrier of Mount Aurès, the surface being also more uneven and diversified by the spurs and peaks which radiate in every direction from the chain of the Atlas. As the effect of its geographical position,

drought is the normal condition of Algeria—absolute drought during six months of the summer, and dryness more or less prolonged even during the six winter months. The colonists talk commonly (almost every year) of exceptional droughts. They delude themselves: the only thing exceptional is abundant moisture.

"This dryness, however, so far from being absolute, is mitigated by the winter rains which go from west to east, increasing in intensity as they go: rather rare at Oran, these rains are frequent at Constantine and Bona. During the rains the average fall closely approaches that of France, and sometimes exceeds it; but the rains are almost altogether confined to the winter months—from October to March.

"Such, in its general characteristics, is the law of the climate of Algeria—a fixed, invincible law, which has its advantages along with its inconveniences, and which must be managed with intelligence, under pain of being defeated by it. This law is familiar to the southern races (for the climates of all the Mediterranean shores are very much alike), but it has never been understood by the administrators of the north of Europe, among others by those who live in Paris, where excessive humidity is the habitual character of the climate. Hence very grave mistakes.

"The economic consequences of this supreme law are in effect these:

"Since there is always a risk in Algeria of a failure of the water-supply for agriculture, intelligent cultivation and policy should unite in the application of their entire force to utilize all the water which falls from the clouds, which flows over the earth, and which penetrates the soil. Since rain falls only in winter and is altogether absent in summer, the excess of the winter fall should be preserved for the necessities of the summer. Every influence favorable to atmospheric humidity should be developed by natural methods, *viz.*, by the conservation of existing woods and the planting out of others. The pasturing of cattle in the woodlands, which involves the destruction of the young trees, should be forbidden or checked with vigilant severity, at any rate on the highlands: means should be taken to prevent (or at least to punish the originators of) the fires which ravage the forests—profound forests which formerly nurtured the elephants destined for the Roman circus.

"In one word, successful administration in Algeria, as in all Northern Africa, in Morocco, Tunis, and Egypt, as well as in Greece and Italy, and the South of France and of Spain, hinges mainly, so far as the promotion of the physical welfare of the inhabitants is concerned, on an intelligent and careful utilization of the water-supply. Water, more water, and more water still, such is the pivot on which agriculture in these countries turns even more than on railways. Allied with heat, water endows the soil with prodigious fertility, while, on the other hand, soil of the best composition remains sterile without irrigation.

"This principle of public well-being required the construction on every water-course in Algeria of dams flanked by canals: yet, after an occupation of 37 years, there is but one in full work, on the Sig, which will endow with more lasting honor the memory of General Lamoricière than any of the battles to which he owed his military glory. A hundred other rivers, water-courses, or torrents, should have been thus dammed to ensure the harvests of a hundred plains. Nothing of the kind has been thought of, or, if thought of, nothing has been done. There has been a greater inclination to spend money in surrounding with fortifications the smallest village in the interior, and on the first opportunity of setting loose the dogs of war. Yet what a difference there is, even as regards the pacification of the country, between the effect of rifles and cannon, harrying and burning, and the effect of dams and canals, fountains and ponds, which would have enriched the natives as well as the colonists. The district of Biskra, in which alone what we call the *hydraulic policy* has prevailed, tells the tale of the virtues of artesian wells.

"Not only have streams of liquid gold and silver been allowed to run down to the sea, but Arab cattle and Arab fires have been allowed to devastate the forests, *i. e.*, to increase the natural dryness of the country; and when the Forest Department, understanding and doing its duty, endeavoured to repress these abuses, it was accused of odious interference with native customs: when just sentences were pronounced against the incendiaries, they were freely remitted as an act of grace. Following on this, Algeria was divided into longitudinal zones, which, for purposes of surveillance, separate the heads of the rivers in the south from their courses and termination towards the north. Thus, the forests, those precious sources of humidity, have everywhere, notwithstanding the wishes of Councils-General and in spite of the protests of the press, been more and more abandoned to devastation. The Arabs have reaped famine and drought as the result of scattering cattle and fire through the woods, a fatal expiation which, following the laws of universal order, creates evil from evil, as it brings forth good from good."

The agricultural future of Algeria depends upon the conservation of existing forests and the reproduction of those which have disappeared. This is a truth which is instinctively accepted, but has not yet been scientifically demonstrated. We shall endeavour to do this here, and to prove that the regulation of the water-supply is intimately connected with the condition of forest vegetation.

Northerly winds prevail on the whole African coast. The resultant average corresponds to N.N.W. In consequence of the position of the Mediterranean between France and Algeria, and under the regular play of the atmospheric currents, it happens that the same wind which keeps the sky perfectly clear on the southern coasts of France, brings rain to the opposite shores. This fact explains how certain years of drought in France correspond to years of fertility in Algeria.

The rainy season is comprised between the two equinoxes from the month of October to the month of March. It is probable that if there were no mountains on the coast, Algeria would be as rainless as Egypt. In ancient times, the Greeks and Phœnicians attributed the inundation of the Nile to the northerly winds or Etesians, which, by a supposed pressure, arrested the course of the river. Democritus, however, guessed the true cause (Diodorus Siculus, lib. ii). He says, in effect, that the inundations of the Nile are occasioned by the rains which fall in Abyssinia and the adjacent part of Africa under the action of the northerly winds driving the clouds towards the south, where *they are arrested by the mountains.*

The distribution of the rains between the three provinces of Algeria is proportioned to the relative elevation of each. It has been proved that on the average twice as much rain falls in the province of Algiers as in Oran, and three times as much as in Constantine. The belt of shore from the great Kabylia as far as Tunis, is exceptionally privileged. It often happens that the rain-fall is confined to a belt of country not extending further than 15 leagues from the sea-shore.

The rain generally comes in storms. The result is, that a considerable mass of water is accumulated on the surface of the soil, which, instead of being absorbed, flows off rapidly. Nobody has travelled in Algeria during the rainy season without having witnessed some of those sudden floods which rush down the torrent beds in one mass, and with such rapidity that herds and even men are sometimes overwhelmed before they have time to escape. In denuded regions the smallest hollows in the earth are transformed in a moment into torrents which, directly the rain has ceased, disappear as rapidly as they formed.

The mountainous regions where the forests have been preserved present a totally different aspect. The rivers rise and sometimes overflow in the low-lands, it is true; but the rise is gradual, not sudden and with a rush. It may be added that in many cases the inundations are caused by a heavy sea at the mouth of the river barring the current of the river and preventing the water from flowing off.

The fact of the rains being confined to a fixed period, to the almost entire exclusion of the remainder of the year, and the violence of the showers, demonstrate the important advantages which would result from having certain places of reception to contain the waters and prevent inundations.

The surest means, as shown by M. Jules Duval, of attaining this double end, are the conservation of the forests and the construction of dams.

The forests act in two ways,—as agents of absorption, and as agents of evaporation.

I have not to consider here the faculty possessed, more or less, by forests of retaining rain water for the supply of springs. Such an important subject cannot be treated incidentally. I prefer referring my readers to the very remarkable articles on this question by MM. Marié-Davy and A. Mangin, published in the September, October, and November numbers last year.

Moreover, I think that in such matters there can be no absolute certainty. For instance, I will readily admit with M. Marié-Davy that on a plain or a gentle slope, an uncovered and especially a light soil should absorb a larger quantity of water than a wooded soil, which will be less cut up, and the surface of which commences by taking up to saturation all the water it can retain. But in proportion as the slope becomes steeper, the conditions change: for a certain quantity of water falling in a given time, absorption depends not only on the degree of *absolute* or *specific* permeability of the soil, but also on the rapidity with which it flows along the surface, this rapidity being proportionate to the volume. In this point of view, therefore, forests, by dividing the currents of the water, and thus opposing a resistance to the flow, offer certain more favourable conditions of absorption. The greater the slope, the more considerable is this advantage over unwooded soil. Lastly, there is a degree, unhappily but too well known, where such unwooded soil can offer no resistance to the movement of the mass of water, and is washed away. The advantage—I will even say the necessity—of forests in such conditions is unquestionable: well, this is in general the case with all the Algerian forests.

In Algeria the influence of the forests upon the regulation of the waters is shown, therefore, perhaps more than anywhere else, in two kinds of useful effects,—they retain, in the first place, for the benefit of the springs, a part of the water which, without them, would be drawn down with the vegetable mould into the valleys, and, moreover, by retarding the flow over the surface of the soil, they moderate the rapidity of the rise of the water and diminish the dangers of the floods.

This, however, is not their only influence. They exercise, along with this, another not less considerable and not less useful influence upon climate by the continual evaporation which they spread through the atmosphere.

Are we, in fact, to see nothing in the evaporation caused by trees but a cause of complaint against the forests, inasmuch as they expend for their own advantage and apparently merely to satisfy the necessities of their existence a part of the water stored in the depths of the soil? If the result were such that all the humidity was absorbed by the forest, and that no excess moisture could find its way to the surface of the soil, the charge would become serious; but the experience of every day proves, on the contrary, that water springs are found specially in wooded regions. And after

all, even if it were demonstrated that forests, instead of protecting water-sources, are causes of their impoverishment, which my experience as a forester will not allow me to admit, it would remain, at any rate, to be considered whether it is not preferable that a part of the water of the soil should be spread through the atmosphere in the form of vapour to temper the excessive heats of certain climates. It suffices for this purpose to pass in review the countries afflicted at the present day with dryness, and it will be seen that the regions where there is an absence of wood are those which suffer most.

Herbaceous plants possess, it is true, in a higher degree than trees this power of vaporisation, but they cannot apply this power and live except with the aid of the water contained in the thin layer of soil accessible to their roots, and, as surface-water lasts *only for a time*, their action is limited to the period of their brief existence which terminates with the first breath of the southerly wind. The forests then can alone be relied upon as permanent agents of vaporisation during the excessive heats of the summer.

The preceding considerations bring me naturally to another train of ideas.

As yet I have shown Algeria as she has been and not Algeria as she should be. In speaking of her forests, my intention has not been to turn to their advantage alone the interest and the merit of a solution. I have endeavoured merely to prove that, in their existing conditions, they are not only useful but indispensable auxiliaries which ought to be protected against improper devastation and the traditional practice of firing. But this is only a partial solution of the great problem to be solved in Algeria. It is not enough to preserve the forests: the plains must also be utilized. What is wanted for this? Water. And to obtain water? Dams.

Who does not see at once the prodigious impulse these works would give to agriculture? The cultivation of cotton* and the creation of artificial meadows could then be seriously taken into consideration. Has any attempt been made to calculate the quantity of forage which Algeria could have furnished to France during the years of drought through which we are passing, if her plains were properly irrigated?

Leaving aside, however, this economic aspect of the question, let us consider only the immediate influence which would be exercised upon the climate by these new methods of utilizing the soil.

I think it will be sufficient to call to mind a very interesting experiment cited by M. Marié-Davy in his article published in the *Revue* of the 10th September last. The learned professor remarked that, in a single day in July, a belt of turf vaporized 5k. 79 of water per square mètre, equal to a height of 0m. 00579. "If the same evaporation," he said, "were produced over the entire surface of the soil during the whole of the year, the heat consumed in the operation would be equal to that which would be absorbed in the melting of a layer of ice about 15 mètres thick. It is almost the half of the heat we receive annually from the sun, according to the calculations of M. Pouillet. The influence of evaporation upon climates can thus be appreciated."

It is shown also from meteorological observations taken in the Isthmus of Suez and discussed by M. Rayet, that the waters of the canal have modified the climatic conditions of the regions they traverse, by lowering the temperature, and sensibly increasing the number of rainy days.

I am satisfied to rest my case upon these quotations. They demonstrate conclusively the point I had to establish and the necessity of the works so urgently demanded by all intelligent persons interested in the future of Algeria.

* See M. Louis Reybaud's article in the *Revue des Deux Mondes*, liv. lii., tom. iii., 1864.

Special care should be taken that the exceptionally favorable circumstances in which the harvests in Algeria present themselves this year, do not cause the misfortunes and disasters of preceding years to be forgotten. Algeria benefits by the atmospheric reaction caused by the dryness prevailing in France; but generally the contrary is the case. Here, unless I deceive myself, is a sort of equilibrium worthy of consideration.

I will add, in conclusion, that no enterprise will be more popular with the natives than works for the regulation of the water-supply. We have nothing to teach the Kabyles in regard to irrigation: the waters of their mountains are admirably utilized. If the Arab has as yet appeared less anxious in regard to these improvements, he is not to be blamed so much as the conditions of tenure among the tribes; for the Arab, on the contrary, has a sort of veneration for water. In his eyes there are three things in the would which make the happiness of the true believer,—beauty, verdure, and the good which flows. Water, he says, issues from Paradise; it is the source and symbol of happiness.* This is very poetic, but the Arab will never occupy himself in the amelioration of his ground by serious works as long as he is not sure of retaining it. It is in this way that all the various questions connected with Algeria are linked together, and that finally the solution of the majority of the questions is found to be connected with the fundamental principle of the creation of individual, instead of tribal, tenure of property. In fact, this principle is now the conviction of all practical men interested in Algeria, and it has been made the starting point of the reforms which have just been promulgated.

Report of the Agent General of Immigrants in Trinidad for the year 1870.

INDIA OFFICE;

London, the 15th August 1871.

Public.

No. 61.

To His Excellency the Right Hon. the Governor General of India in Council.

MY LORD,—In continuation of my despatches of the 23rd June and 28th July 1870, NOS. 68 and 83, I forward herewith, for the information of your Excellency in Council, copy of a despatch* addressed by the Governor of Trinidad, to Her Majesty's Secretary of State for the Colonies, covering the report† for the year 1870 of the Agent General of Immigrants in that Colony. I also forward copy of a letter‡ from the Chairman of the Emigration Board reviewing that report.

* 19th May 1871, No. 91.

† February 1871, No. 32.

‡ 23rd June 1871.

2. I am glad to perceive that the mortality rate is low and seems to be gradually decreasing. This result is attributed to the system recently introduced of giving rations in lieu of wages to newly-arrived immigrants, a subject to which the attention of your Lordship's Government was called in my despatch of the 15th of June last, No. 48, transmitting the report on immigrants at Grenada during the year 1870.

3. The Governor of Trinidad, your Excellency in Council will observe, is prepared strictly to enforce the rule prohibiting the allotment of coolies to

* *La Vie Arabe et la Société Musulmane*, par le General Daumas, 1869.

estates where the mortality exceeds seven per cent., a restriction which has already had good effect.

4. It is evidence of the general prosperity of the immigrants that large numbers of them have accepted grants of land in lieu of the return-passages to India to which they are entitled, whilst others amongst them have purchased land, and settled in the Colony.

5. It will be seen that Governor Longden suggests the grant by the Colony, in consideration of a four years' service under indenture, of a return-passage to India to coolies who, having served their time in other Colonies, have come to Trinidad without a claim to such return-passage. The Emigration Board is in favor of the plan, and the question having arisen in another Colony, the Earl of Kimberley is considering the expediency of establishing uniformity of practice in this matter.

I have the honor to be,

MY LORD,

Your Lordship's most obedient, humble Servant,

ARGYLL.

No. 91, dated Trinidad, the 19th May 1871.

From—Governor J. R. LONGDEN.

To—The Right Hon. THE EARL OF KIMBERLEY, &c., &c., &c.

I HAVE the honor to forward herewith six printed copies of the Report of the Agent General of Immigrants for the year 1870.

2. During the season terminating on the 1st October 1870, 2,933 immigrants were embarked in India for Trinidad, of whom 52 died on the voyage, and 2,881 landed in the Colony, the mortality being on the whole only 1·7 per cent.

3. The rate of mortality among newly-arrived immigrants in the first year of their residence has, according to Dr. Mitchell's tables, been annually reduced from 8 per cent. in 1866 to 3·4 per cent in 1870. This reduction is attributed, I think, justly to the system of rationing the newly-arrived immigrants. It is a little startling to find that the mortality among the immigrants introduced in the season of 1868-69 was only 4·1 per cent. in their first year while being rationed, but rose to 10·7 per cent. in their second year when the rationing was discontinued. This is the highest rate of mortality recorded in the enclosed tables, and appears to be exceptional. So far as the mortality may have resulted from the too early discontinuance of rations, all danger of a recurrence of it is removed by the provisions of the Ordinance No. XIII. of 1870, Sections 26 and 28 of which require employers to furnish their indentured labourers with rations for the first *two* years of their residence, unless otherwise ordered, on the application of the immigrants themselves, by the Agent General. I shall watch carefully the effect of the working of the law in this respect.

4. After the first two years of residence, the mortality among the population of East Indian origin appears to be scarcely as great as that among the other races.

5. In connection with the question of mortality among the Indian immigrants is the prohibition placed upon the allotment of immigrants to estates on which the mortality has exceeded seven per cent. by the 67th clause of the Immigration Ordinance which is referred to in your Lordship's circular despatch of the 16th of March last. I have in my despatches Nos. 8 and 20 of this year reported the number of estates which became disqualified to receive immigrants under this rule.

6. Although the Trinidad rule is very stringent, and the enforcement of it will seriously depreciate the value of the estates which are affected by it, I think that on the whole its operation is likely to be very beneficial in compelling the owners of estates in defence of their own personal interests, to use every means in their power to secure the well-being of the labourers. If, as may sometimes be unfortunately the case, the estates are so situate relatively to undrained morasses, or other unhealthy Districts, that despite all care, the rate of mortality cannot be reduced, the allotment of immigrants to such places must cease, although it should even cause the abandonment of the property; for it would not be just to the immigrants to send them to such places. On the other hand, if the rate of mortality on all or most estates were in any year swelled beyond the prescribed limit by an epidemic, which affected coolie and creole alike, it might hardly be fair to maintain the rule in all its strictness.

7. I desire to draw your Lordship's attention to Dr. Mitchell's remarks on the acceptance by coolies of land in lieu of return-passages. I recently reported on this subject in my despatch No. 61 of the 13th ultimo. Up to this time 188 immigrants have commuted their passages, and the number appears to be gradually increasing.

8. Besides those who have commuted their right to a return-passage for a free grant of land, several coolies have purchased land either from the Crown or from private persons and settled here. From a return furnished by the Sub-Intendant, it appears that 96 coolies have purchased among them 910 acres of Crown land at the ordinary price of £1 per acre, besides village lots. It will be seen that on an average each coolie has purchased nearly ten acres for himself.

9. The general conduct of the indentured coolies during the year is reported favorably upon by Dr. Mitchell, the only grave exception being the savage but unpremeditated murder of an African overseer on an estate by two coolies, reported in my despatch No. 1 of the 3rd of January last.

10. Under the head of "labour supply from other Colonies," Dr. Mitchell notes that 2,641 people arrived during the year, and 910 left. Among those who remained were a few coolies who had terminated their industrial residence in other Colonies, but were not entitled by the terms of their agreement to a free passage back to India (*i. e.*, from the second Colony). Some of these people have applied to know whether this Colony would provide them with a free passage if they agreed to be indentured for a certain term of years. To this question I have deferred giving any answer until I shall learn whether your Lordship would be disposed to sanction such an arrangement.

11. Under the Ordinance of 1870, No. XIII. (clause 48) a free passage is given to immigrants brought from India, after an indenture of five years and a residence of five more, making ten years in all. In these cases the Colony has incurred the whole cost of bringing the immigrants from India. In the case now under consideration the coolies arrive in the Colony without cost to the Colony. It would of course be necessary, before such an arrangement could be permitted, that the immigrants should produce satisfactory proof that they had complied with the conditions on which they were brought from India to the West Indies (*i. e.*, to their first Colony), and were legally entitled to depart from the Colony to which they had been at first carried. Subject to this proviso, I do not think there would be any objection to a compliance with the request of the immigrants on such terms as might be considered equitable between the Colony and the coolie. The rate at which a coolie is by law allowed to purchase the last years of his indenture is £3 per annum (Immigration Ordinance, clause 72); and if the return-passage be reckoned at £12, it would be paid for by a four years' indenture, if at £15, by a five years' indenture. I am inclined to think a four years' indenture would, under the circumstances, be sufficiently favorable to the Colony.

No. 32, dated Trinidad, the —— February 1871.

From—H. MITCHELL, ESQ., Agent General of Immigrants.

To—The Hon. J. S. BUSHE, Colonial Secretary.

I HAVE the honor to enclose, for the information of His Excellency the Governor, some explanatory remarks on the tabulated extracts from the quarterly returns for the year 1870 already submitted to Council, together with such incidental suggestions on the subject of immigration as appear worthy of record.

I.—Arrivals of Immigrants and Mortality at Sea during the Season terminating 1st October 1870.

SHIP'S NAME.	Date of arrival.	No. embarked.					Died at Sea.					No. landed.				
		M.	W.	B.	G.	I.	M.	W.	B.	G.	I.	M.	W.	B.	G.	I.
Beaumaris Castle ...	3rd Nov. 1869	192	142	72	54	43	5	4	...	1	3	187	138	72	53	40
Varuna	8th „ „	273	109	43	19	17	6	4	3	1	2	267	105	40	18	15
Wiltshire	20th Dec. 1870	217	210	77	56	57	...	4	1	1	5	217	206	76	55	52
Atalanta	24th Feb. „	188	118	42	23	26	3	2	...	...	...	185	116	42	23	26
Cochin	7th April „	288	118	35	16	23	..	2	...	...	...	288	116	35	16	23
Jessa	4th May „	279	124	28	24	20	...	1	4	...	...	279	128	24	24	20

By this table it appears that, on 2,933 souls embarked, the deaths at sea were 52 equal to 1·7 per cent., or about 1 per cent. on the adult passengers. The births on board were 22, considerably over the average.

In the annual report for 1869 the mortality at sea was 63 on 2,264, or 2·7 per cent., being the lowest rate recorded up to that date.

The fortunate results of the season 1870 are due, no doubt, in great measure, to careful selection and assiduous care on the part of the Surgeon Superintendent and others in charge, but I fear it would only lead to disappointment were similar results expected in future from any arrangements, however judicious or systematic. The present low rate of mortality is exceptional, and seems to have depended much on the reigning medical constitution when the ships left Calcutta, and the unusually favorable weather experienced when at sea—factors which are unlikely to concur in any future season.

II.—Rate of Mortality among Indentured Indian Immigrants.

The sum total under this heading is complicated with the varying years of residence. To be a reliable exponent, it must be analysed so far as to shew the mortality of each year within at least the limits of the five years of industrial residence, as well as the death-rate on all indentured, including those under bounty and those who are re-paying the time lost during their contract.

In the year ending 30th September 1870 there were resident on estates employing indentured immigrants in this Colony 17,298 souls. From these, after deducting 400 who returned per *Atalanta* to Calcutta in August last, there remained 16,898 arranged as follows:

1,518 boys, 1,216 girls ... ... =	2,734
2,755 men and 1,201 women, who have served out their contracts and remained in this Colony for periods varying from 6 to 26 years ... ... =	3,956
These have not re-engaged, but work where they please.	
2,330 bounty coolies, who have terminated their original contracts and are at present working out fresh annual engagements ...	2,330
7,888, who are in various periods of their five years' contract from the first to the fifth year	7,888
TOTAL ...	16,908

Beginning with these last, the mortality rates will, perhaps, be more clearly illustrated by the details of the following table:

Arrival and Mortality for each of the years 1866, 1867, 1868, 1869, *and* 1870.

	1866.	1867.	1868.	1869.	1870.	
Arrived	1,055					
Died	86					
Rate	8·1 o/o					
		Arrived.				
Remained	969	2,402				
Died	68	167				
Rate	7 o/o	6·9 o/o				
			Arrived.			
Remained	901	2,235	1,655			
Died	31	134	126			
Rate	3·4 o/o	6·4 o/o	7·6 o/o			
				Arrived.		
Remained	870	2,101	1,529	1,829		
Died	32	78	109	75		
Rate	3·7	3·7 o/o	7·1 o/o	4·1 o/o		
					Arrived.	
Remained	838	2,023	1,420	1,744	2,211	
Died	17	47	56	162	77	
Rate	2 o/o	2·3 o/o	3·9 o/o	10·7 o/o	3·4 o/o	
Remain	821	1,976	1,364	1,582	2,134	= 7,877

The table gives a death-rate of 359 on 8,236 = 4·3 as against 4·7 per cent. during the preceding year. This diminution, although small, is as much as might have been expected from the unusual vicissitudes of the season. A reference to last year's immigration report will shew

that there was some reason to apprehend heavy rates for 1870. The apprehension was verified, but not in the manner anticipated by a gradual extension of the rate over all classes; for the figures in the table shew that, while there has been a marked decrease of deaths among the newly arrived in their first year, and while, being rationed, the rate has more than doubled among those in their second year of residence, who also, in 1869, presented a similar immunity when under rations; in other words, the advantage from the low death-rate due to the rationing in 1869, has been counterbalanced by throwing these same immigrants on their own resources and paying them entirely in money during the second year, so much that their mean death-rate for 1869 and 1870 has been 4·1+10·7÷2=7·8, a little over the average of the two first years of the arrivals in 1866, 1867, and 1868. This result, unless it can be otherwise explained, shews the propriety of the 26th clause of the Ordinance No. XIII. of 1870, extending the feeding of new immigrants over the first two years, except where it shall be otherwise ordered after the first 12 months on the personal inspection of the Agent General or other authorised officers, who, when satisfied that particular immigrants can earn their livelihood, may draught them from rations to full money wages.

This table shews another important fact that, during the last three years of contract, the mortality immediately falls in a marked degree averaging 2·7 per cent. above that of London. On the remaining 9,020 Indians, comprising bounty, unengaged, and children, there are 160 deaths recorded, equal to 1·7 per cent. Among the children the rate was higher, 66 on 2,734, equal to 2·4 per cent. The total deaths for the year 1870 were 519 on 17,256, equal to 3 per cent. on the resident Indian population on estates, a trifle under that of the preceding year.

It is but fair to the Trinidad planting interest to state that, by the Indian mails of 17th December, the mortality, as given by the Sanitary Commissioner, for 1870, in most of the larger towns of the Punjab, was 10 per cent., fever being prevalent.

III.—Absentees.

Of these there are now 309 as against 351 in the previous year, and the decrease is in rapid proportion as regards the later arrivals:

	1st year.	2nd year.	3rd year.	4th year.	5th year.	
No. allotted	2,111	1,829	1,655	2,402	1,055	9,052
„ Absent	2	19	35	43	17	116

Thus 9,052 arrived since 1866, inclusive, declare 116 absent or 1·2 per cent., shewing, by the first column, how much this favorable result is due to the system of rationing recently adopted. Deducting 116 from the total absent, 309, there remain 193 introduced at periods anterior to the last five years, but who are unlikely to re-appear and claim the privilege of serving out their former lost time. These may be written off to profit and loss. The whole statement contrasts favorably with the returns so late as 1864, when the absentees under indenture were 599.

This system of rationing the newly-arrived is not, however, universally approved; many of the employers allege that, under it, the people too frequently get into debt and then refuse to work out the deficiency, preferring to malinger in hospital, where they are at least sure of being fed, and thus contract habits of idleness which become persistent. These difficulties, however, at the outset of a new system, which both employers and employed are inclined to evade, though from different motives, can scarcely be put in the balance against a marked saving of life, and a still more marked prevention of absenteeism.

To this must be added the fact that, on many estates, the only parties who owe for rations are the delicate or weakly, who must have perished without them, while the returns, in many instances, shew a larger amount of labor by the rationed than the unrationed immigrant. Were it shewn by objectors to the system of rationing that the imported laborer cannot, as a rule, earn 8 cents. while in health to repay the cost of his daily ration, it would be time to enquire somewhat more closely into the merits of the system. No doubt the laborer himself would prefer his labor, however small, to be repaid entirely in money, but experience shews that the result of such a system is to double the mortality in the seasoning years. The women are more difficult to deal with than the men in the matter of refusing to work sufficiently to repay their rations, and this employers generally attribute to their comparative immunity from the penal clauses of the Ordinance. Yet the free women work, as a rule, more regularly than the men. Perhaps their capricious behaviour might be successfully met by an indenture without rations, which simply bound them to an industrial residence on the same estate as their husbands; but, leaving them at perfect liberty to work or not as they

choose, the probability is that, under such circumstances, they would prove more regularly industrious than at present. Opinions, however, are divided on this point, and some gentlemen whose experience is entitled to great consideration think the plan would not work well but lead to greater license than at present; but, on the other hand, it may be expected that the want of rations and the influence of their husbands would lead them to some little exertion. Where women arrived burthened with young children, the latter should of course be fed.

IV.—Return Immigrants.

In the *Atalanta*, 950 tons, Ballingall Master, which sailed from this on the 26th August, were embarked for Calcutta 215 men, 98 women, 39 boys, 37 girls, and 12 infants = 401 souls = 351 adults. These Indians had all but two completed their industrial residence, exclusive of the children, 88 in number, who were natives of the island. This large proportion under the age of ten years may be perhaps accepted as a fairer index of the parents' domestic status than the comparative wealth they transmitted to India: 238 adults having deposited for that purpose in the treasury £10,139, being, on an average, more than £40 each. As averages, however, are at the best but uncertain guides, it may be well to state, for the information of those who doubt the practical advantage of these Indians seeking to better their circumstances by a ten years' contract in the West Indies, that, of the 238 depositors above-mentioned, 214 were ordinary laborers, and that the amount of their earnings, or rather of their savings, was $32,784. This sum is no doubt small when compared with the traffic gains of the petty tradesman, but it must be borne in mind that these latter had to serve their five years' industrial contract before they amassed the wherewithal to start in trade. Of late years, bankruptcy from over-speculation is of frequent occurrence among the Indian traders, while, on the whole, the savings of the laboring classes, especially after the termination of their contracts, appear to increase. The large proportion of females on board the *Atalanta* together with the equality of the sexes among the children, resemble colonising more than emigration statistics. The *Atalanta* arrived at Calcutta with a loss of 3·2 per cent.

Since her departure, upwards of 100 coolies entitled to return, have registered their names for that purpose.

V.—Commutation of Return-passage.

Against this heavy loss of seasoned labor there is to be chronicled on the other hand the fact, and a cheering one it is to all who know the almost ineradicable adherence of the Indian to his traditions, that, during the last year, more than 120 immigrants who had served their industrial contract, have, instead of a return-passage, commuted that privilege for grants of 10 acres of land each. These 10-acre lots lie in blocks together selected so as to allow the new settlers to alternate the clearing and planting of their own lands with laboring for hire on the adjoining estates. This so far successful movement of settling a certain number of Indians, has, particularly in the Upper Couva and Montserrat, been accompanied by the transformation of numerous squatters into peasant proprietors with fixed tenure of lands. These in their turn have found labor to spare for the neighbouring larger cultivation in a proportion that has greatly relieved the owners from the risk of employing unseasoned Indian laborers in localities or labor injurious to their health.

A reference to late returns will shew that, in April 1868, 231 adults left in the *Arima* for Calcutta, taking with them $65,585, so that, in the short space of 27 months the limited labor supply of this Colony has been drained of 670 seasoned adults whose remitted saving amounted to $117,369, while, to this serious loss of labor, must be added about £10,000 for back-passage. It is clear that the continuation of this course leaves the Colony but at the commencement of colonization and liable to great commercial and agricultural risk from any casual stoppage or diminution of the stream. The success then of the allotment scheme, as far as it has gone, furnishes important data as to the propriety of its modifications to suit the tastes and temper of the Asiatic and promote at the same time the true interest of the Colony. The only grave objection which has been made to its more general adoption is, that a 10-acre lot is more than one man with his family can cultivate unaided, and that, therefore, to make his land availably productive, he must, instead of occasionally contributing labor to the estates in his neighbourhood, actually draw on them for his own supply. Although this objection has not been yet realised in the incipient stage of settling these peasant proprietorships, there can be no doubt that as these allotments increase in number and extent among the most suitable localities they will attract the neighbouring laborers in exact proportion to the industry and ability of their owners. It becomes, therefore, in view of this probability, a question of importance whether it might not be a prudent measure to limit the acreage of land to what a man might be reasonably expected to cultivate with his family's aid, and pay up the balance of the commutation of the return-passage in money; at the same time, any modification, to be really useful, should include the women, by the offer of a direct money-payment, based on their age and the number of their children. These useful people might thus be induced to colonise in reality the land which they have as yet selected only as a temporary sojourn.

This last suggestion has been made by gentlemen of experience, not merely capable of viewing the subject from all points, but deeply interested in its success. The chief objection made is that the offer of money-payments would tempt such numbers to claim them that even those who have no present intention of returning to India would appear among the number, and thus embarrass the treasury by the amount of cash claims. This fear is, however, groundless ; the number of Indians who can claim this privilege it not large, and if all came forward, the money spent would be well invested in settling them as tax-payers ; the expense under any circumstances could not amount to more than one-half of a return-passage.

The present tendency to accept land instead of repatriation, whatever be its cause, is an exceptional feature in the Indian character, and should be encouraged to the utmost while it lasts ; for the Indian, in spite of all belief to the contrary, clings tenaciously, traditionally to his return-passage.

It may be, when he knows that he can at any period, however distant, secure a return-passage by paying for it, he may waive the immediate claim, and take land with the ultimate view of selling it when improved, and returning with greater wealth. Should he do so, the early impressions of home, although tolerably fixed, will gradually loose their hold of men working on their own land and growing their own rice, betel, &c., surrounded by their children in a favorable climate.

VI.—Increase in available Indian labor on Estates.

The available Indian labor in 1870, as compared with that of 1863, is as follows on estates employing indentured servants :

1863.—Contract	10,078	
Without contract	2,046	
Total on estates ...	12,124	resident.
1870.—Contract	10,218	
Without contract	3,946	
	14,164	resident.
	2,500	non-resident.
Total working on estates ...	16,664	resident and non-resident.

These figures shew the gradual but important change in the quality of labour that has developed itself with the increased production of the Colony. While the amount of contract labor, including the voluntary bounty system, has remained almost exactly the same as in 1863, the amount of Indian labor free from contract of any kind beyond a very loose construction of the master and servants ordinance, has reached nearly the same figure, say 4,000 free and 2,500 non-resident Indians.

This last is almost entirely an item created within the last few years by the excessive demand for labor immediately after crop, which, of course, raises the rate of wages for all outsiders, and is a powerful inducement to the coolie who has finished his contract to remove from the estate to the nearest roadside where he can have a plot of land for his mud hut.

Hence the villages which have sprung up in so many localities of late, and hence also may be added a sound reason for settling as many as possible of these people on land of their own, held immediately from the Crown.

Any tendency to abuse or undue extension of this privilege can be effectually controlled by requiring in each case a certificate from the Immigration Office, that the applicant for land is fitted for a colonist in respect of age, family, &c. ; because there are no doubt, many cases in which it would be to the advantage of Trinidad to give an Indian his return-passage instead of a grant of land

VII.—Labor Supply from other Colonies.

This has been numerically much the same as during one or two previous years.

Arrivals	2,641
Departures	910
	1,731

leaving over 1,700 as a permanent addition to the labor of the Colony. The 910 who have left is much higher than the usual figure, and indicates either less demand for labor during the past year, or that the inducements to go elsewhere are greater. A large proportion, however, of these latter are natives of the neighbouring islands who habitually work here during the crop season and return after harvest, to attend to their own provision grounds. They are an independent and useful body of people, bearing much the same relation to the

sugar crop of Trinidad as the Irish reapers formerly bore to the farm work on the west coasts of Britain.

Their numbers and value will increase with every additional facility given to inter-communication among the islands.

VIII.—General Conduct and Distribution of Labor on Estates.

The behaviour of the indentured population has been throughout the last year remarkably quiet. Complaints on their part have been fewer than usual, and the gaol returns shew that the commitments for offences other than breach of contract had fallen from 737 in 1869 to 351 in 1870, or to less than one-half. The only grave exception to the general peace was a savage but unpremeditated murder committed by two indentured immigrants on one of their foremen while on duty.

In other respects, tranquillity has been the rule, springing chiefly from the happy balance of the different classes engaged in estates' work. This classification is well illustrated in the important County of Victoria where the adult labor-table is as follows :

	Males.	*Females.*
Indentured Indians, resident on estates ...	2,770	1,191
Non-indentured Indians, resident on estates ...	1,554	712
Non-indentured Indians, non-resident on estates ...	787	329
Creoles, resident on estates	1,020	508
Creoles, non-resident on estates	879	459
Total ...	10,209, shipping a crop of 27,000 hhds.	

It will be observed from these figures that the non-indentured Indian laborers in this District are nearly equal in number to those under contract, while the total number of non-contract laborers, including creoles of the West Indies, exceed those under contract by more than 50 per cent.

A very curious feature in these figures is that the number of females in each of the five classes bears a nearly equal ratio to that of the males, whether taken from the Indian or the creole, and this, notwithstanding that the last census of the town of Port-of-Spain shewed 2,000 more women than men.

IX.—Disqualification Clauses.

The action of clause LXVII. of the Immigration Ordinance of last year, which disqualifies an estatefor receiving coolies when its mortality during the previous year has exceeded 7 per cent. on the number actually under their first contract, has been considered by some as too stringent.

Experience so far does not confirm this view. The number of estates which passed the limit in 1869 was 20, out of 120, by no means an excessive check, considering the season. And during 1870 the number has only reached 10, affecting a population of but 660 out of 7,888 adult laborers.

The limit is less stringent in reality than in appearance, because the mortality is rarely over the limit on the same estate for two consecutive years, and as the arrivals are partly during the fall of one year and in the early spring of the next, the chances are, it gets an allotment from one or the other set of arrivals.

Of course, a continuation of mortality over 7 per cent., for several consecutive years, would disqualify an estate from receiving new immigrants, and leave it to recruit the ranks from the various classes of free laborers already shewn to be so much on the increase from various sources. In connexion with this subject, it may be stated that cases sometimes occur of parties being allotted to estates, who, although at the time in tolerable health, yet quickly break down from concealed infirmity and become eventually chargeable on the community or swell the death-rate. Employers complain, and with good reason, that their percentage of death is thus liable to be increased from sources they cannot control.

This is an evil of serious magnitude and difficult to guard against, unless the recruiters could be made answerable for the fitness of those whom they recruit. What they do now is simply to collect people whose external appearance enables them to pass as sufficiently healthy to be embarked without risk of dying on the voyage, but there appears to be no special examination as to professional fitness for field labor. Men are drawn from sedentary classes and shipped as agriculturists who may have afterwards to walk a mile or so to their work.

These people take two years, on an average, as the return shew, before they are seasoned to the climate, or rather to the new kind of work required. It is the same in all countries, and the fact was brought prominently before the Central Relief Committee by Mr. Rawlins, C. E., in his report on the Lancashire operatives during the cotton famine. He says that, of two thousand called able-bodied, not one-fourth per cent. could ever become able-bodied.

If such were the result among comparatively healthy Englishmen in their own country, it is not surprising that the weaker Hindoo mechanic or artisan should require, as we find he does, two years of seasoning before reaching the status of an able-bodied laborer here. Probably the surest check on the recruiters scheming would be to provide some system of District medical examination before the recruit is attested by the District Magistrate ; the expense would be small, compared with any subsequent inspection, and sift out some at least who now reach the Colony without benefit to themselves, after causing a heavy outlay to be

followed by no reasonable prospect of a corresponding return. Recruiters should also explain to volunteers that the wages which, in the attesting papers, they state as current in Trinidad, from 8 to 10 annas up to 1 and 2 Rupees, mean that only the healthy and willing earn the first-mentioned sum, while only the willing and able-bodied can earn a rupee—any higher rate is attained exclusively by skilled laborers or headmen, for whose duties new immigrants are rarely competent.

X.—Application for the allotment of Immigrants.

There is yet another point which may be alluded to before closing these remarks and which requires Regulation, *viz.*, the annual applications for Indian immigrants under Clause XII. of Ordinance No. XXIII. of 1870. At present there is no legal limit to the number for which any individual may apply, provided he comply with existing rules.

But the number ordered from India is fixed by Council. Hence the applications generally reach a much higher figure than the corresponding shipments from India. Take for instance last year; the number applied for by employers was over 3,000 adults, while the number fixed by Council was 2,000, from which, after deducting children under age and deaths at sea, there will usually remain under 1,900 for distribution in the Colony, or less than two-thirds of the demand. The result of this state of matters is that those who ask simply for the number calculated to meet their wants are disappointed and dissatisfied. While others, to ensure their supply, ask for 50 or 100 per cent. more than they wish for or require. It is most desirable that this uncertain demand should be replaced by some formula based on the real wants of each estate, say its average crop, or other data to be decided on by the proprietary members of the Immigration Committee; to such a method there does not appear any grave objections; and any exceptionally high demands might be referred on their own merits to His Excellency the Governor.

Dated Emigration Board, the 23rd June 1871.

From—Sir T. W. C. Murdoch, Chairman of the Emigration Board.

To—Mr. Herbert.

I have to acknowledge your letter of 19th instant, with a despatch from the Governor of Trinidad, inclosing the report of the immigration agent for the year 1870.

2. The number of emigrants despatched from Calcutta to Trinidad in the season 1869-70 was 2,933, of whom 52 died at sea,—a mortality equal to 1·7 per cent. This is an unusually small mortality, owing, no doubt, to a careful selection of the emigrants,—to the good sanitary condition of Calcutta at the time of the emigration, and to favourable circumstances on the voyage. Dr. Mitchell anticipated the probability that future seasons may not be so fortunate, and experience shows that the mortality on the voyage varies largely in different years. There has, however, been a gradual improvement for several years past, due in great measure to the greater attention paid to sanitary arrangements in the depôts and the more careful examination and selection of the people before they are embarked.

3. Dr. Mitchell next proceeds to state and analyze the mortality among immigrants in the Colony. There are some apparent inaccuracies in his figures which I am unable to explain; but they are not sufficient to affect his conclusions.

4. First, as to the mortality of new immigrants. Dr. Mitchell gives the number of deaths in each year among 1,952 immigrants who have arrived since 1866. The striking fact in this table is the large mortality, down to 1·69, of the first two years after the immigrants' arrival compared with subsequent years. During those two years the average mortality was nearly 7 per cent.; during the three following, it was rather less than 2¾. In 1869 an Ordinance requiring employers to ration their immigrants for a year after arrival, came into force, and the mortality among the new arrivals of that year fell to 4·1 per cent. But in the second year, when the same people rationed themselves, the mortality among them rose to 10·7 per cent.; thus making their mortality in two years rather more than the mortality in the same period of those who arrived before 1869. An Ordinance (No. III. of 1870) has been since passed to require employers to ration their immigrants for two years after arrival. There has not been time to ascertain its results, but if a judgment may be formed from the table before us, it may be expected to have very beneficial effects. After the second year the people appear to be acclimatized.

5. The number of coolies under indenture in 1870 was 8,236, among whom there were 359 deaths, equal to a mortality of 4·3 per cent. But of these deaths, 239 occurred among 3,953 immigrants who were in their first or second years, being equal to 6 per cent., while in the remaining 4,281 immigrants there were only 120 deaths, equal to 2·80 per cent. Even among the newly-arrived immigrants, therefore, the death-rate of 1870 was not so high as before 1869, notwithstanding that it is swelled by the excessive mortality in their second year of the immigrants who arrived in 1869, to which I have before referred. The death-rate among new arrivals in 1870 was only 3·4 per cent., less than half the average mortality of new arrivals in the four previous years. If any justification were required for maintaining the Rationing Ordinance, notwithstanding its want of popularity with both employers and immigants, it is to be found in these facts. No doubt some of the immigrants do not work out the value of their rations, but these Dr. Mitchell says are principally the delicate and weakly, who, if they had not been rationed, would have perished; while the returns show in many instances that the rationed immigrants work better than the unrationed. The objections of employers to the system may reasonably be expected soon to pass away. Apart from all question of humanity towards the immigrant, they must feel that the preservation of the lives and health of the labourers whom it has cost them so much to introduce, is commercially of much greater importance to them than any small loss they may incur from the inefficiency of some of those labourers during their first two years.

6. In addition to the 8,236 immigrants working out their industrial residence, there were 9,020 others, including those working on bounty, the free, and children, among whom there had been during the year 160 deaths, equal to a rate of 1·74 per cent. The deaths among the whole number of Indians on estates, 17,256 in number, were 519, equal to a rate of 3 per cent.

7. The number of absentees, the Agent says, is considerably smaller in proportion than in former years, another beneficial effect which he attributes to the Rationing Ordinance.

8. On the 26th August the *Atalanta* sailed with 401 return emigrants for Calcutta. Of these, 214 adults, described as "ordinary labourers," deposited for transmission to India 6,830*l.*, or nearly 32*l.* a-piece, while the deposits of the remaining 14 amounted to 3,309*l.*, or more than 236*l.* a-piece. The latter were no doubt tradesmen, and, as may be inferred from the Agent's observations, men who had made their money by speculation.

9. During the year 120 immigrants commuted their right to return-passage for grants of land of 10 acres each under the system recently established. It has, it appears, been objected to this system that 10 acres exceeds what a man can cultivate himself, and that, as these settlements increase, the settlers will be likely to come into the labour market as competitors for labourers with the planters. To obviate this objection, the Immigration Agent suggests that the lots might be reduced in size, and the difference made up to the immigrant by a money-payment. The system has been too short a time in operation to show exactly how it will work; but the Governor's despatch of 15th April last, inclosing the report of the Superintendent of Crown Lands, described the effect of the Indian settlements on the supply of labour to plantations as the reverse of what the Immigration Agent attributes to it. Experience will show which is correct, as the system develops itself.

10. The conduct of the people is said to have been very good, the only serious offence having been the unpremeditated murder of a foreman by two immigrants. The commitments for offences, other than breach of contract, had fallen from 737 in 1869, to 351 in 1870.

11. The restriction placed by the Immigration Ordinance on the allotment of new immigrants to an estate where the mortality of the preceding year had exceeded seven per cent. appears to be producing its effect. The number of estates that came within its operation in 1869 was 20; in 1870 the number was reduced to 10. The whole number of immigrants on these estates was 600.

12. Among the laborers on estates are a certain number who come from other Colonies, having there worked out their industrial residence. Some of these have applied to the Governor to know whether Trinidad would provide them with a return-passage on their undertaking to work for a certain number of years under indenture. The Governor requests instructions on this point, explaining at the same time why he thinks an indenture of four or five years would be sufficient in their case. The conclusion to which he comes is, that a four years' indenture would probably be sufficient. In this I agree. It is clear that not only would the Colony incur no expense for the introduction of the immigrant, but as an acclimatized and instructed labourer, his four years' service would be more valuable than the five years' indenture of any new immigrant that could be procured. It is, therefore, a matter of policy to offer such terms as will tempt immigrants who have completed their industrial residence elsewhere, and are dissatisfied with their position to come to Trinidad; and there is always a probability that men sufficiently independent and self-reliant to change their Colony in the hope of bettering their position, might eventually accept the advantages offered by the Indian settlements to those who prefer to become settlers, instead of returning to India.

Reports on the state of the Season and prospects of the Crops.

General Remarks.—In Bengal, Madras, British Burmah, the Central Provinces, Mysore, Coorg, and the States of the Central India Agency, prospects have not changed during the last fortnight, and may be considered on the whole favorable.

In the North-Western Provinces and Oudh the previous accounts of the damage done to the kharif by inundation are confirmed, but the weather has, during the period now reported on, been good for the rabi sowings.

In Bombay there is, if any change, a slight improvement.

Upper Sind has suffered somewhat from floods.

In the Punjab, West Berar, and Rajpootana, especially the last, the want of rain for the rabi sowings begins to cause apprehension.

The prospects of the cotton crop are unchanged.

No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of message from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
		West Berar. — Akola	October 9	*Nil.*	October 11	No rain, except very slightly in two taluks, to be of any material benefit. The autumn crops in good ground are still in fair condition; in inferior soil, have withered. Rain urgently needed for spring sowing, also for filling the wells.	Owing to the almost total failure of rain during the preceding fortnight, and to excessive heat, cultivation is fast drying up in parts of the division.
	BERAR	West Berar. — Buldana	„ 7	„	„	Crops in fair order, but rain much wanted.	
		West Berar. — Basim	„	1·29	„	The quantity of rain (1·29) fell in Pusad taluk only, where the crops are promising. In Basim taluk rain-fall very slight; prospects of crops uncertain, being dependent on an early fall of rain.	
		East Berar. — Woon	...	3·	„ 12	Crops in good condition. Cotton in pod. Rain much needed, especially for the wells.	
		East Berar. — Ellichpur	...	·22	„		
		East Berar. — Oomrawuttee	...	·05	„		
		Delhi	October 11	*Nil.*	„	Crops ripening and good, except millet. Rain wanted.	Rain greatly needed throughout the Province for rabi sowings.
		Ambala	„	„	„	Prospects fair. Rabi sowings delayed for want of rain.	
		Jalandhar	„	„	„	Irrigated crops promise well. Unirrigated crops mostly lost.	
		Lahore	„	„	„	Rain much wanted for rabi sowings. Bari Doab Canal flowing since 6th instant. Sohag Inundation Canal flowing, others empty.	
	PUNJAB	Multan	„	„	„	Kharif out-turn one-fourth less than last year. Preparations in progress for rabi sowings. Several cattle have died in tahsil Serai Sidhu from disease said to be brought on by peculiar effect of river water.	
		Rawul Pindi	„	4·	„	Agricultural prospects good in northern tracts; bad in south.	
		Peshawar	„	·1	„	No improvement in harvest prospects since last report. Out-turn expected to be three-fifths of an average one.	
		Burdwan Division	„	...	„	Weather clear; crops very good, and even in inundated parts not much injured. In Burdwan district some damage apprehended from want of rain.	Rivers falling rapidly: crops looking well.
		Dacca „	„	...	„	Prospects of the crops continue favorable. In Furreedpur sugar-cane crops much damaged.	
		Patna „	„	...	„	Floods subsiding. Much damage caused in Tirhoot, Sarun, and Chumparun. Ten to twelve-anna crop expected.	
	BENGAL	Cuttack „	...	...	„	A little more rain needed for the rice crop. Crops generally good. Cholera has made its appearance at Birkesoripur.	
		Bhagulpur „	...	...	„	River rapidly going down. Rice crops partially damaged. Cold weather crops excellent.	
		Rajshahye „	...	...	„	Rivers rising again in Rajshahye and Pubna. Crops for the most part favorable. Amun in low lands has suffered.	
		Presidency „	...	...	„	Floods subsiding: crops much damaged.	
		Masulipatam	October 11	1·34	„	Insufficient; canals low. Crops not doing well.	Government considered promise of season and market good.
		Negapatam	„	3·62	„	Prospects good.	
	MADRAS	Kurnool	„	2·72	„	Rain general. Crops good: prices falling.	
		Trichinopoly	„	5·77	„	Harvest rather short, but prospects good.	
		Calicut	„	4·15	„	Condition satisfactory.	
		Ahmedabad	„	*Nil.*	„	Prospects for rice not very good, and for other crops only fair.	*Cotton crops.*—In Broach, cotton remains fresh from dews. In Dhollera taluka, its condition is improved. In Veerumgaum, the plants are throwing out new leaves, and in the rest of the Ahmedabad district and Kaira, generally cotton healthy. In Sind, cotton crop mostly good. In the Southern Maratha Country, growing crops making good progress. General prospects unaltered, except in the Southern Maratha Country, where there is decided improvement.
		Poona	„	1·98	„	Kharif crops in good condition in the western districts, save Joowra and Kheer. Sowing of rabi in progress in the eastern districts. Growing crops doing well.	
		Dharwar	„	5·76	„	A seasonable and plentiful fall throughout the whole collectorate; crops in good condition. Hopes entertained of the rice crops somewhat reviving.	
	BOMBAY	Sholapur	„	·18	„	Crops good.	
		Broach	„	*Nil.*	„	Rice and juar suffering beyond Broach in a circle north-east and west; crops generally in a fair state.	
		Khandeish	„	„	...	Elephanta showers too slight to be of much service. Later sown crops retrograding. Heavy dews, but rain wanted.	

No.	Presidency or Province.	District.	Date of District report.	Rain-fall for fortnight preceding.	Date of message from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
	BOMBAY—*continued* ...	Sindh	October 12 ...	...	... ...	River falling steadily and regularly, and now eight feet above datum level at Hyderabad. In Upper Sindh results of inundation show damage done to kharif crops in some talukas. Two villages in Rohree district and part of Multan high road carried away by erosion. Several bridges and public buildings destroyed by floods. Begaree and other canals much damaged by the same. Efforts being made to secure a plentiful rabi as water subsides. Bad fever prevalent in the frontier district. In Central and Lower Sindh season prospects good. Kharif harvest in full progress; crop abundant; rice crop also good; cotton good and healthy; rabi operations commencing. No case of cholera from Persian Gulf beyond the first two reported. Weather at Kurrachee variable; but, as a rule, cool for time of year. Cloudy still at times, but no rain. No cattle disease reported.	
	N. W. PROVINCES ...	Agra	... ...	*Nil.*	October 12 ...	Kharif as before; rabi operations progressing.	No report received from Benares. Floods in Jounpur and Azimgurh subsiding. Fever and cholera feared.
		Bareilly	... ...	„	„ ...	Harvest and sowings continue.	
		Meerut	... ...	„	„ ...	Prospects fair average.	
		Allahabad	... ...	„	„ ...	Prospects more favorable.	
		Raipur	October 9 ...	·61	„ ...	Prospects of kharif excellent. Break in weather has enabled cultivators to prepare ground for rabi crops. Fever general, and cattle murrain in parts.	
		Bilaspur	„ ...	4·35	„ ...	Crops very healthy. Cotton slightly damaged by excessive rain.	
	CENTRAL PROVINCES.	Sambalpur	„ ...	·45	„ ...	Rice crop in higher lands poor, on low lands very good. Pulses promise well; oil seeds very good, but cotton everywhere failed.	
		Nagpur	„ 10 ...	*Nil.*	„ ...	Kharif crops in good condition. Rabi sowings commenced. Prices of grain fallen.	
		Jabalpur	„ 11 ...	3·44	„ ...	Crops excellent. Rice being harvested. In Dumoh, cotton and juar suffered from excessive rain in all but hilly tracts. In Seoni, cotton flowering and rabi sowings commenced. In Mandla, crops excellent, rice being reaped.	
		Hoshangabad ...	„ ...	...	„ ...	Fair weather has done good, and prospects favorable. Rain in Saugur Tahsil.	
		Chhindwara ...	„ ...	3·64	„ ...	Kharif splendid, rabi prospects favorable in both districts. In Narsingpur fine dry weather has done great good. Crops very promising, Rabi sowings in progress.	
	OUDH	Lucknow Fyzabad ...	... ...	*Nil.*	„ ...	The rains have apparently come to a close. Reports communicated on the 28th ultimo of serious damage to kharif are confirmed. Fine weather of last fortnight has improved rabi prospects. Sowings are being pushed on as rapidly as possible, though generally retarded by the late rain and floods. In parts the lands cannot be made use of as it is still covered with water.	
	BRITISH BURMAH ...	Akyab	October 11 ...	2·4	„	Prospects very good. Crops fair, about 20,000 acres damaged by inundation.	In the Province generally the weather has been satisfactory. Crops, though partially destroyed by inundation in places, on the whole promise well.
		Rangoon	„ ...	·5	„ ...		
		Moulmein	„ ...	10·3	„ ...	Crops fair.	
		Thayetmyoo	„ ...	2·12	„ ...	Prospects good.	
		Toungboo	„ ...	3·57	„ ...	Crops fair.	

No.	Presidency or Province.	District.	Date of District report.	Rain-fall for fortnight preceding.	Date of message from Local Government or Administration.	State of Agricultural prospects.	Remarks of Local Government or Administration.
12	Mysore	Bangalore	October 12	3·68	October 12	Crops healthy; prospects very favorable.	The rain-fall has been general and seasonable. Agricultural prospects excellent.
...	...	Mysore	„ 10	1·74	„	Crops generally thriving.	
...	...	Coorg	„ 12	4·21	„	Prospects good. A good coffee crop anticipated.	
...	Central India	Indore	„ 11	No rain since last report.	„	Crops generally favorable. Rabi sowings commenced in Gwalior districts.	
...	...	Gwalior	„		„		
...	...	Rutlam	„		„		
...	...	Sirohi	„ 7	...	„	Wells drying. Crops very indifferent. Rabi prospects very gloomy.	
...	...	Meywar	„ 5	*Nil.*	„	Water scarce. Crops reaped, mostly fair.	
...	Rajpootana	Marwar	Sept. 30	„	„	Great fears of rabi failure. Rain much wanted. Crops tolerable. If no rain rabi will only be about half.	Famine expected in Meywar, Mhairwara.
...	...	Deoleekota Jhalawar	„	„	„	Tanks full. Prospects good.	
...	...	Ulwur	„	1·	„	Abundant rain in the southern, the reverse in the western. Crops mostly reaped, partly good, partly average.	
...	...	Bhurtpur	„	·1	„	Crops fair.	
...	...	Joypur	October 11	*Nil.*	„	Harvest good.	
...	...	Ajmere	.....	„	„	Crops fair in Ajmere.	

The Cotton Crop.—Mr. H. Rivett-Carnac, Cotton Commissioner for the Central Provinces and the Berars, writes as follows under date Simla, the 13th instant:

The prospects of the cotton crop throughout India continue unchanged.

In Western India the crop promises well. The reports from the Wurdah and Poornah Valleys are, on the whole, excellent. The weather is clear and dry, such as the plant requires at its present stage.

The Assistant to the Cotton Commissioner in West Berar (Khangaon country) telegraphs that the weather in that division is hot, and that rain is required for the sowings of the spring harvest, and that the cotton there, which is somewhat backward in consequence of the dryness of the season, would benefit by moderate rain. The prices of grain are, he reports, rising. It will be remembered that this tract has suffered somewhat from want of rain.

In the valley of the Ganges the fine weather, which returned with the full moon, is improving the crops, which have suffered from excessive rain.

GOVERNMENT OF INDIA.

HOME DEPARTMENT.

Correspondence regarding the shrine of Sukki Sarwar from which was issued the purwana found on the Fakir who attacked Mr. Bull in Lahore.

From L. H. Griffin, Esq., Officiating Secretary to the Government of the Punjab, to the Secretary to the Government of India, Home Department,—No. 207 S, dated Simla, the 2nd October 1871.

I am directed to submit, for the information of His Excellency the Viceroy, a letter No. 2553, dated 25th September, from the Commissioner, Lahore Division, with annexures, on the subject of tracing Mahomed Khan, Afghan, the man mentioned in the purwana issued by the priests of the shrine of Sukki Sarwar, which was found on the person of Nawab Shah, a fakir, who committed the assault some time ago on Mr. Bull, Assistant Secretary of the Lahore Municipality.

2. Enquiries have been made in several Districts and by several officers with the object of discovering the residence of the person named in the purwana, but hitherto without success.

3. The explanation, however, which is given by Captain Sandeman, Deputy Commissioner, Dehra Ghazi Khan, appears to the Lieutenant-Governor a satisfactory one, and he is disposed to think that the purwana in question had no political significance whatever. It was issued according to the custom of the shrine by the priests with the object of getting rid of a petitioner who refused to depart until his prayer was granted.

4. The character of the priests of the shrine of Sukki Sarwar has hitherto been good, and there has been no reason to believe that they have been implicated in any political intrigues whatever.

5. The Lieutenant-Governor does not see any object in insisting upon a register of all orders issued by the shrine to be kept up, nor does His Honor see that the practice which has hitherto been followed is an objectionable one.

6. Should any further information of importance be obtained with reference to the case, it will be communicated to the Government of India at once.

From Captain R. G. Sandeman, Deputy Commissioner, Dehra Ghazi Khan, to the Commissioner and Superintendent, Lahore Division,—No. 927, dated Dehra Ghazi Khan, the 21st September 1871.

I have the honor to acknowledge receipt of your No. 2467, dated 14th instant, and its enclosures, on the subject of the purwana found on Nawab Shah, Fakir, who so recently attacked a gentleman in the street of Lahore.

2. With a view to affording a satisfactory explanation regarding the finding of this purwana on the person of a man of Nawab Shah's description, it seems necessary for me briefly to record a history of this noted shrine and its customs.

3. The shrine is known as Sooltan Sukki Sarwar, and both Mussulmans and Hindoos from the Punjab and Scinde pay yearly pilgrimages to it. It is said that, during the year, from 180,000 to 200,000 pilgrims of all denominations and castes visit it. These come generally from the Punjab and Scinde: the shrine itself being very little reverenced in the Derajat. Dewan Sawun Mull used to tax the pilgrims and derive considerable revenue from the practice.

4. The shrine is situated at the mouth of the Sieree Pass leading in the direction of Candahar, and is built on the "daman pahar." As a rule, the country there is without vegetation; not even a blade of grass is to be seen; and the priests, who number about 1,650, besides women and children, in proportion, are, with the exception of a revenue-free grant which they hold from Government, and which does not amount to over Rs. 350 a year, entirely depend for subsistence on the charity of the pilgrims and disciples who reverence the shrine.

5. The late Sukki Sarwar, in whose honor the shrine was raised, was noted for his liberal and charitable disposition and great generosity of character, and it was on this account that he got the name of Sukki (which literally means liberal—generous), as he extended his benefits to men of all creeds and religions. Hence it is that on his death he was exalted to the position of a saint: both Hindoos and Mussulmans reverencing his memory and worshiping at his tomb.

6. It thus happens that on account of the character he held, when alive, it is believed that Sooltan Sukki Sarwar, if his good offices can only be propitiated, has still on earth the power of giving to all who petition his shrine what he so liberally bestowed during his life-time. From this cause all who are in distress, whether it be in mind or body, come to his shrine to ask for his intercession in their favor. One man may have no family. He asks Sukki Sarwar to grant him a son; another has lost his wealth by unfortunate speculation; the saint's pity is entreated, and his aid asked for the future, and so on.

7. Pilgrimages to Sukki Sarwar's tomb are made by all classes and denominations of men in the hope that their present and future wants may, from the known generosity of the saint, be complied with.

8. During the months of February, March, and April, a large fair is held at the shrine, and the disciples of Sukki Sarwar assemble in large numbers. It is almost needless to say that amongst these come fakirs and needy persons of every kind and description.

9. The fair is over in April, or at the latest early in May, and those attending it have by that time returned to their homes, with the exception of a few who have special requests to make of the high priests. These priests are two by name,—Mullicks Noor and Futteh. They are well known to me, and they are both well-behaved and well-disposed men: their object in life being to keep up the peculiar character of their shrine. I trust, from what I have said above, that this character is anything but a fanatical one. All go to it,—Sikh, Hindoo, or Mussulman,—and all receive the same treatment; and the profession of the priesthood is, to treat all alike, without permitting religion to interfere.

10. But to return to those who remained after the fair. A day is fixed for their particular petitions being heard. This is done in the presence of one of the head priests, who is generally willing, if able, to grant all required of him; money is generally asked. As the shrine is poor, and is supported by charity, this cannot be supplied, and the petitioner is asked if he knows any particular person who, on account of his liberal disposition, is likely to bestow it in the name of Sooltan Sukki Sarwar. The petitioner then names a person who, he thinks, may be induced to comply. An order is written on that person in the shape of a purwana, and it is passed under the great seal of the shrine and presented to the applicant who is thus, in a cheap and easy way, silenced and got rid of, if not sent away, quite satisfied. The order is also often complied with; and it thus often happens that a needy fakir derives much benefit in a pecuniary way from a pilgrimage to Sooltan Sukki Sarwar.

11. I will now endeavour to answer the questions contained in your letter, to which this is a reply. After describing the attack on Mr. Bull, as well as the circumstances connected with the finding of the purwana with the Sukki Sarwar seal on it, you ask who is Mahomed Khan Afghan, and where is he to be found. To this I answer that the priests do not know, and are not likely to do so. The custom is for the parties petitioning the shrine to name, as already described, those on whom they want orders in the hopes of obtaining pecuniary help, and the disciples thus named may or may not be known to the priests. This view is fully supported by all my information, and is confirmed by the statement made by the fakir himself, who explained to Dr. Lethbridge how he got the purwana. That officer writes—"Nawab Shah, in answer to my questions, says that other fakirs were writing down the names of those whom they thought would give money on a purwana from Sukki Sarwar being issued on them, and that Deendar, the man he has referred to in his statements before, told him that he knew a rich Pathan by the name of Mahomed Khan who would be a good man to get a purwana on. He then went and had this purwana written, mentioning the name himself."

12. The priests declare that they remember quite well Nawab Fakir's being at the shrine and asking for an order. That at the time Nawab got his purwana they also gave orders to from 25 to 30 others, and, as their disciples are very numerous, it does not follow at all that the particular disciple named on whom the order is issued is known to the shrine. It is just the reverse; for the priests lead a quiet inostentatious life, living, as it were, out of the world, and were not likely to trouble themselves as to who any disciple named really was, unless there was some special object in doing so. The giving of the order to Nawab Shah was an ordinary event, and he states that even he himself did not know who Mahomed Afghan was, but gave his name on the recommendation of another.

13. I got a copy of the purwana which the shrine generally issues to unfortunate fakirs and others, and it is similar in every respect to the one found on Nawab Shah. I also, before I received any communication from you on the subject, sent another somewhat similar purwana, obtained from a respectable Hindoo (and which had been issued on him, asking him, in the name of Sukki Sarwar, to afford aid to the person to whom it had been granted), to the Secretary to the Punjab Government, and at the same time I gave him briefly an explanation of the customs of the shrine, and with regard to the issuing of these purwanas, expressing my belief that the finding of the Sukki Sarwar purwana on Nawab Fakir had no political significance whatever.

14. Before concluding this letter, one other point requires to be noticed, and that is, the fact of the Sukki Sarwar shrine issuing, in the wholesale way above related, those orders on their disciples.

15. The doing so is in itself really very harmless, and I do not think it would be a wise measure to interfere with the practice, as the priests make capital out of these orders. If it was thought necessary they might be asked to keep a register of all orders issued, with a description of parties receiving them, and on whom they were issued. I do not think the priests would object to this. In fact, this was proposed to me by a Native gentleman of good position, who is one of their disciples, and he said that they would be glad to do anything required of them.

16. This I quite believe; for, as already observed, the community of priests are well behaved, and seem a well-disposed body of men entirely free from fanaticism. In this respect they certainly have inherited the good qualities of their great ancestor, Sooltan Sukki Sarwar.

17. The original purwana found on Fakir Nawab Shah is herewith returned. It was forwarded to me by Major Munro, Commissioner and Superintendent, Derajat, to whom you sent it.

N. B.—The fact of twelve pilgrims having left together with purwanas was no unusual thing. Often they go and come to the shrine in numbers.

GOVERNMENT OF INDIA.

FOREIGN DEPARTMENT.

Extract from the diary of Mr. R. B. Shaw, Joint Commissioner, Ladakh, from the 27th August to the 2nd September 1871.

August 28th.—I received from Mr. Drew a copy of a proclamation, by which all duties still leviable at Leh are abolished. These consisted chiefly in taxes on iron, rice, &c., and other produce which was imported for consumption in Ladakh. The Custom House at Leh will, therefore, for the future, only be kept up for the purpose of verifying the "permits" or "passes" with which traders coming from Cashmere are furnished, and which state how much goods the trader has paid export duty for in Cashmere.

Thus, all traders from our own Provinces, whether trading through Central Asia or only with Ladakh itself, are entirely freed from any imposts, and, I conclude, from any Custom House examination; also, whatever dues are levied on the local trade between Ladakh and other parts of the Maharaja's dominions will not be levied at the Ladakh end.

Such are the present arrangements.

August 30th.—Owing to the nature of the country traversed by the Chang-Chimmo route, travellers are very likely to mistake their way, and thus fall into great difficulties; even without losing the proper route, they often suffer great hardships—they and their horses—from not knowing the proper halting places, and where to stop for grass and fuel. Pending any more permanent arrangement, the Joint Commissioners have thought it advisable to appoint certain guides who shall accompany the caravans, and show them the road and the halting places. Some such plan is necessary before the Chang-Chimmo route can have a fair chance with the Karakoram route, where every step of the way is well known. For instance, in going from the head of the Chang-Chimmo to the head of the Karakash (the route taken

by Mr. Forsyth last year on his return), it is necessary to spend one night without grass for the cattle; but it depends upon the traveller finding one particular ravine (where there is grass) among numerous others, through all of which the road might equally well be taken, whether his horses shall not have to spend a second night of starvation.

I have selected two guides,—one a Tibetan, and the other a Yarkandee,—settled in Ladakh. We have agreed to give them Rs. 5 per mensem, together with provisions on the road. If they are successful in bringing down the caravans without undue loss, they have been promised a suitable reward. They started on the 30th up the road to meet the kafilas.

No news yet from Yarkund.

No. 40 of 1871.

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, OCTOBER 21, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

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GOVERNMENT OF INDIA.

FINANCIAL DEPARTMENT.

Opium Cultivation in China.

From G. W. CAINE, ESQ., Her Britannic Majesty's Consul at Hankow, to the Secretary to the Government of India, Financial Department, Calcutta,—No. 42, dated British Consulate, Hankow, the 31st July 1871.

I HAVE now the honor to report on the cultivation of the poppy in this part of China under the heads mentioned in Mr. Wade's despatch of 15th June last.

Question 1*st*.—What sort of crop (whether good or bad) has been gathered, especially in the South-Western Provinces, Yunnan, Szechuen, and Kwei-Chow; and in the North-Western Provinces, Kansu and Shênsi; and in the North, in Manchuria?

Answer 1*st*.—It is generally reported at Hankow by opium brokers from up-country that the crop of opium in Szechuen for this year 1871, is an unusually good one, the weather having been dry and fine.

Concerning the crops in Yunnan and Kwei-Chow, it is impossible to speak for certain, as but little of the drug arrives here directly from those Provinces.

It may, however, be surmised that the fine weather existing in Szechuen, has extended to the neighbouring Provinces, in which case a good crop may be expected; and, indeed, there are abundant signs of a hopeful feeling existing in Hankow amongst native opium merchants as to this year's crop.

No information has been able to be obtained here about crops in Shênsi and Kansu, but the Mahommedan rebellion, which has so long existed in these Provinces, and which has only just been suppressed in one of them, Shênsi, will have effectually prevented any very extensive cultivation of the poppy. Concerning Manchuria, nothing whatever is known here.

Question 2nd.—Any particular circumstances that have affected or are likely to affect the out-turn?

Answer 2nd.—The unusually fine weather which existed in Szechuen during the beginning of the year, and of which the low condition of the waters of the Yangtse here up to July was a proof, would be eminently favorable to the opium crop, nor have any allusions been made to ravages arising from blight or disease.

Question 3rd.—Is cultivation of the poppy generally and specially in the writer's own vicinity extending, or the reverse?

Answer 3rd.—In the Province of Hupei in which Hankow is situated, the area of cultivation appears to be much as formerly. The chief opium District is in the West of the Province bordering on Szechuen in the prefectures of I-chang and Huh-an-fu.

Here a considerable quantity is grown and called Chiso-tu. It is said to be of excellent quality, but the quantity produced only just suffices for local consumption, though the article is much sought after when it can be obtained, and a heavy price is paid for it.

It is likewise stated that at several places in the country, the peasantry cultivate small quantities of opium by way of making a few cash.

The quantity is infinitesimal in amount, and can have no effect on the opium market; but it may be a straw showing how the wind blows. It is doubtful, however, whether the soil of this Province is fertile enough to render opium cultivation profitable, and tea, the staple of Hupei, and possessing the double advantage of being profitable and legal, will probably prevent any great extension of poppy cultivation.

In the neighbouring Provinces of Hunan and Honan, some attempts have been made towards the cultivation of the poppy; but the large imports of foreign and native opium into these Provinces show the amount to be but slight. A beginning, however, has been made, and the cultivation of the poppy may, in the fertile country of Honan, be profitably extended; but the Province of Hunan can never, from the poverty of its soil, become a formidable competitor for growth of opium.

In Szechuen, nearly half the Province is already appropriated for opium, and the cultivation of it being profitable, it may safely be supposed it will be extended further if possible; but the soil of West Szechuen being less fertile than that of the East portion, any further increase will be impeded. Of increase or reverse in the Provinces of Yunnan and Kwei-Chow, no statistics are obtainable, except that, so far back as 1836, the fertile spots in that Province are mentioned, in a memorial addressed by Choo-Tsun to the then Emperor, as being appropriated for the growth of the poppy; and it may safely be stated now that the produce is very considerable, though the Mahommedan rebellion existing there would be a check to any great extension. An estimate made in 1869 gives piculs 20,000 for annual yield of Yunnan, piculs 15,000 for Kwei-Chow, and piculs 6,000 for Szechuen.

These figures, however, are open to criticism, for it seems remarkable that the Province having the largest export of opium should produce the smallest crop.

Question 4th.—Any action of the imperial or local authorities affecting opium?

Answer 4th.—No direct action has been lately taken against its cultivation. Heavy transit dues and an increased land tax are the only means used.

Proclamations are, of course, continually being issued by local Magistrates, exhorting people to cultivate cereals and abandon opium for more useful crops; but, as the officials are the chief consumers of the drug, and, in addition, derive a considerable revenue therefrom, these proclamations are intended only as a means of exacting more money from the cultivators.

Question 5th.—Is the consumption of native opium extending in the interior and in the treaty ports, and how is it affecting the consumption of Indian opium, and whence is the native opium procured which is consumed in the writer's vicinity?

Answer 5th.—The consumption is decidedly on the increase, and more native opium comes down here every year; but it does not appear as yet to have any effect on the foreign drug. The total of opium-smokers is becoming larger every year, and their number increases much more rapidly than the amount of native opium produced. It may even be stated that the increased consumption of the native article has a favorable effect on the sale of the foreign drug. Its cheapness increases the number of smokers, and they, having acquired a taste for the drug, betake themselves ultimately to the best kind they can procure, which is, of course, the Indian opium.

It is stated here by foreign firms that, until the production of opium equals the demand, and the area of cultivation bears a more equal proportion to the increasing number of consumers, no fears need be entertained for the Indian opium, and even then the superior quality of the foreign drug would continue for some time to give it an advantage. The want of rapid modes of transit is a further disadvantage, and the Indian may be expected to hold its own for some years, and its sale perhaps rather to increase than diminish.

The following table shows the import of opium into Hankow for the years 1868, 1869, 1870:

Opium imported.	1868.	1869.	1870.
Malwa	Piculs 3,007	Piculs 2,441	Piculs 3,536
Patna	„ 98	„ 202	„ 205

Szechuen is the greatest producing District for Hankow, almost the entire importation coming from that Province.

The quality is not first-rate, but its cheapness makes it popular with the poorer classes. Some is also imported from Yuhnan, but the long distance, the difficulties of transit, and the heavy taxation, prevent any large importation. Its quality is said to be excellent, nearly equalling that of Indian opium, and the conterminous Province of Hunan is largely supplied with it. It is, however, a significant fact that this Province is likewise the largest importer from Hankow, as a centre, of the Indian drug, so that the best native opium would seem, under the most favorable circumstances, unable to compete successfully with the more tasty article. The Yunnan opium is undoubtedly the most formidable rival the Indian drug possesses, but the cultivation of it having been in existence for the last 50 years, the maximum of extension may have been attained. It is largely imported into Hunan and Szechuen, and Chueng-ching-fu in the latter Province is a central depôt for the Yunnan opium as Hankow is for the foreign.

From the expense of carriage and taxation Szechuen can now hardly be reckoned as a consumer of the foreign drug, though, in former years, some little was sent. The Yunnan opium has to some degree taken its place from its being both excellent in quality and cheap and close at hand, but the opening up of a port in Szechuen to foreign steamers would probably have the effect of increasing import of foreign opium.

Question 6th.—What the relative prices are of native and of Indian opium, and whether anything is known that is likely to affect them?

Answer 6th.—The prices ruling in Hankow market are now, for—

Yunnan, 1st quality, Tls. 380 per 100 catties.
Kwei-chow „ „ 370 „ „ „
Szechuen old „ 320 „ „ „
„ new „ 296 „ „ „
Foreign opium from 500 to 540 taels per chest.

Indian opium is consumed chiefly by the wealthier and official classes, its dearness having always prevented its becoming a common article of consumption with the poorer classes. The native article is consumed by the poor exclusively as inferior teas are in England, and the great extension of opium cultivation in China has been induced to supply a demand which the more expensive drug was unable to satisfy.

The rich continue, and will continue, to smoke the best that can be procured, and, unless the foreign drug becomes so adulterated as to become inferior to the native opium, it will continue to hold its own in the market. The price of foreign opium has remained nearly stationary here for the last two or three years, ranging from 500 to 550 taels per chest, nor is there much expectation here of its being lowered. The price of the native article has a slow, but very slight, tendency to decrease, the increased production being compensated for by the increased and increasing number of consumers, and, until the one has overtaken the other, no important reduction can be expected.

The following prices of various kinds of native opium, given by Baron Richtofen who traversed the Province of Honan in the spring of 1870, may prove interesting, but their accuracy cannot be vouched for:

1*st.*—Kansu 900 to 1,000 cash a tael.
2*nd.*—Shênsi 800 „ „
3*rd.*—{Honan, Shansi} 600 to 700 „ „
4*th.*—Szechuen 400 to 500 „ „

1,100 cash = a dollar = 4*s.* 3*d.*, and 16 taels = 1 catty, 100 of which make a picul, equalling 133⅓ lbs.

Question 7th.—Any facts regarding the position of Persian, Turkish or other opium (not Indian or indigenous) in the market?

Answer 7th.—A large foreign firm at this port imported some Turkish opium, but it being found unsaleable here, it had to be returned to Shanghai.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Reports on Indian Immigrants in the Colonies of British Guiana and St. Vincent.

From Her Majesty's Secretary of State for India, to His Excellency the Right Hon'ble the Governor General of India in Council,—No. 57 (Public), dated India Office, London, the 27th July 1871.

In continuation of my despatch of the 23rd of February last, No. 8, I transmit, for the information of your Excellency in Council, copy of a despatch* from the Governor of British Guiana, with its enclosures, forwarding the report on the coolie immigrants in that colony for the half-year ending 31st December 1870.

* Dated 2nd May 1871, No. 65, 12 enclosures.

2. I also transmit copy of a despatch* from the Lieutenant-Governor of St. Vincent, giving cover to the report for the same period, on the Indian immigrants in that colony.

* Dated 9th May 1871, No. 40, 5 enclosures.

Copies of the reports* from the Emigration Commissioners on the above papers and of the replies† returned by the Secretary of State for the Colonies to Governors Scott and Rawson are herewith enclosed.

* Dated 9th and 20th June 1871.

† Dated 30th June and 3rd July 1

From His Excellency J. Scott, Governor, British Guiana, to the Right Hon'ble the Earl of Kimberley, &c., &c., &c.,—No. 65, dated Georgetown, British Guiana, the 2nd May 1871.

I have the honor to transmit the report of the Acting Immigration Agent General, together with the consolidated half-yearly return in regard to immigrants for the half-year ending 31st of December of last year.

2. The number of immigrants on the estates at the close of the year consisted of 29,870 males under indenture, and of 7,640 males not under indenture; of 10,006 females indentured, and of 4,888 females unindentured; giving a total of 37,510 males and 14,888 females, or a grand total of 52,404 immigrants working on the estates. Compared with the previous year, 1869, this exhibits an increase of 3,568 males, 1,593 females, or a total of 5,161 in the number of immigrants. There has been a small percentage increase in the females in 1870, but not so great as the increase in 1869. In 1868, for each 100 males there were 37·29 females, in 1869 there were for each 100 males 39·17 females, and in the past year, 1870, for each 100 males there were 39 69 females. Every increase, however small, tending to bring about a nearer approach to an equilization in the sexes is satisfactory. Your Lordship will observe that the proportion now existing between the sexes of the immigrants in the colony falls only by a small fraction short of that required by the recent regulations to be sent from India.

3. In 1869, the percentage of births was 2·31, in the past year the percentage was 2·13; in both years, the sexes were very nearly equal.

4. The average mortality, including both indentured and unindentured immigrants on estates in 1869, was 2·11 per cent.; in the past year, it has risen to 3·06 per cent. This increased death-rate may, perhaps, in some degree, be attributable to the large number of immigrants introduced in the season 1869-70, amongst whom the number of deaths is always larger than amongst the older resident coolies. During the past year, an attempt has been made to ascertain the death-rate amongst immigrants who have been less than two years in the colony, and I find it is returned at 5·48 per cent., being nearly 2·72 per cent. greater than the average mortality on all classes of immigrants. The average mortality for the past five years ending December 31st, 1870, amounts to 3·46 per cent.

5. Applying the rules laid nown in Lord Granville's despatch, No. 192 of the 29th of March of last year, the returns of 1870 shew that five estates exhibit a mortality exceeding 6·12 per cent., or double the average of the year; and that the mortality on four estates is over 6·92 per cent., or twice the average death-rate of the last five years throughout the colony.

6. The four estates, which would, in accordance with the instructions I have received, be excluded from having an allotment of immigrants in the next season are Spring Garden,

Aurora, Belle Vue, and Wales. The following table exhibits the percentage mortality on these estates in each half-year of 1870:

	Half-year ending June.	Half-year ending December.
Spring Garden ...	... 4·18 per cent.	6·23 per cent.
Aurora	... 2·65 „	6·86 „
Belle Vue ...	... 5·74 „	1·67 „
Wales ...	... 1·37 „	5·57 „

7. Spring Garden must, I fear, be classed as a permanently unhealthy estate. In 1869, the mortality was 9·44 per cent.; in 1868, 8·44 per cent.; in 1867, 5·56 per cent.; in 1866, 12·5 per cent.; and in 1865, 6·12 per cent.,—giving an average for the five years ending December 1869, of 8·52 per centum. The average death-rate for the past year 1870 may be stated as being nearly 10½ per cent. I have drawn the attention of the proprietor to the necessity of his making every exertion to lessen the mortality, and I have no fault to find with him in this respect. A new hospital has been built, cottages of a better construction are provided, and iron tanks have been erected for a supply of rain water. The medical attendant, who lives on the adjoining estate, also visits the hospital daily. Should these improvements not effect a reduction in the number of deaths during the present year, then I consider no further allotment of coolies should be made.

8. The death-rate on Aurora, an estate adjoining Spring Garden, may be given at 9½ for the past year. In 1869, it was as low as 2·94 per cent.; in 1868, 5·48 per cent.; in 1867, 8·81 per cent.; in 1866, 2·9 per cent.; and in 1865, the mortality did not exceed 1·01 per centum. The rate of mortality has fluctuated a good deal; and, seeing that in the previous year 1869 it was only 2·94 per cent., and that the average mortality for the five years ending December 1869 was as low as 4·2 per cent., I trust that the large mortality of the past year may prove to be exceptional.

9. Belle Vue exhibits a death-rate during the past year of about 7½ per cent. In 1869, it was 6·48 per cent.; in 1868, 3·43 per cent.; in 1867, 5·69 per cent.; in 1866, 6·73 per cent.; and in 1865, 8·41 per cent., giving an average for the five years, ending December 1869, of 6·18 per centum. This estate must also, I fear, be classed as an unhealthy estate; in two years only, *viz.*, 1868 and 1867, has the mortality fallen within the prescribed limits.

10. Plantation Wales exhibits a mortality of about 6·9 per cent. This would scarcely exclude it from a fresh allotment of immigrants, and yet I find that the average death-rate for the five years ending December 1869 is as high as 7·36 per cent.: in this respect ranking next two Spring Gardens and above both Belle Vue and Aurora, indeed the last estate, although in the past year exhibiting a very high rate of mortality, in the general average it falls below numerous other estates.

11. On examining the statistical returns relating to immigrants for the last six years, a few estates exhibit a constant yearly high rate of mortality, and may be regarded as unhealthy estates; the majority, however, show a continual yearly low rate, and may, therefore, be classed as healthy estates. But others show a remarkable fluctuation in the annual percentage of deaths, for which no ostensible cause can with certainty be assigned, and it is chiefly in regard to these that the application of the rules laid down by Lord Granville will be found to be difficult and embarrassing.

12. Your Lordship was good enough in a despatch No. 63 of the 12th of January last to entrust to me the discretionary power of not enforcing the rule, considering that every exertion is being made to improve the sanitary condition of the estates; and although, as I have above reported, three estates show for the past year a mortality beyond the limits prescribed, I do not propose to exclude these estates from another allotment of immigrants, unless in the interval before the next immigration season commences. I find that any decrease in the annual death-rate appears to be hopeless. I fear this will be the case with the Spring Garden Estate, and I can only hope it will be confined to this one.

13. In your Lordships's circular of the 16th of March last, my attention is drawn to the 67th section of the Trinidad Ordinance, which prohibits the allotment of immigrants to an estate where the deaths during the previous year shall have exceeded a percentage of seven persons in the hundred amongst the indentured immigrants who have not completed an industrial residence of five years; and I am authorized to adopt this rule if I consider it expedient. I think, in some respects, a fixed percentage would be preferable to the fluctuating rate which would be obtained by taking an annual or five years' average. The past year's statistics give, however, by this latter plan, a percentage of only a very small fraction below 7 per cent. The rule enforced in Trinidad applies only to immigrants under their first indentures of five years, and in the returns compiled by the Immigration Department, no distinction is made between immigrants serving a first, second, or third term of service; they are only classified into immigrants under indenture, and immigrants not under indenture. And as I have explained in a former despatch, no note of the ages of the persons who have died has,

until recently, been made in the half-yearly returns, which, in order to carry out Lord Granville's instructions, strictly is required.

14. I presume, in the application of the rule determined by Lord Granville, it will be sufficient to obtain the yearly average of deaths, or the five years' average in the total number of immigrants working on the estates, making no distinction between those serving a first, second, or further period of five years' service, or between indentured or unindentured immigrants, but that the refusal to assign any further immigrants will only be considered as applicable to immigrants arriving from India and entering upon their first term of service. Immigrants entering upon a second or third period of service take bounty, and are free agents, and if this class of coolies are disposed to re-indenture on an estate where the mortality is beyond the prescribed percentage limits, I presume they will be at liberty to do so. The practical effect of this will be that the proprietors of permanently unhealthy estates will not have allotted to them any newly arrived immigrants, but may obtain at least a limited increase in their coolie labourers from the older residents or acclimatized immigrants.

From DENIS M. GALLAGHER, ESQ., Acting Immigration Agent General, British Guiana, to the Hon'ble J. M. GRANT, Government Secretary, &c., &c.,—No. 365, dated the 19th April 1871.

I HAVE the honor to forward herewith the consolidated return of immigrants under indenture of service, or residing on plantations in British Guiana, for the half-year ending 31st December last.

2. I endeavoured, by issuing forms and a circular on the 24th December last, to procure a prompt and accurate return being made from each plantation,—see enclosure No. 1, and I tried, in the enclosure No. 2, to anticipate and guard against inaccuracy or want of fulness of information. I found, however, that notwithstanding the minuteness of "suggestions" in that respect, very serious inaccuracies and accidental neglect did occur in the preparation of the returns, and I was thus compelled to send them back for correction and amendment two or three times in many cases, for which purpose I prepared the enclosure marked No. 3.

3. The last of them was returned to this office only on the 5th instant, upon which the consolidated return was, as soon as possible, completed, and would, but for the arrival of the *Neva* and *Ganges* (with immigrants from Calcutta) have been submitted a week or ten days since.

4. The Commissioners of Enquiry report, paragraph 529, page 124 of their report, that the "average mortality would appear to be as nearly as possible 4 per cent. (per annum of course) on the whole" (immigrant) population; while the elaborate table prepared by me as to the five years ending 31st December 1869 exhibits a rate of 3·84 similarly.

5. The plantations that have reached or exceeded those rates during the *half-year* ending 31st December last, and which, therefore, demand special examination and investigation are—Pln. Philadelphia, West Coast, Demarary, 4·29 per cent.; Pln. Wales, West Bank, Demarary, 5·57 per cent.; Pln. Cullen Aroabisce Coast, Essequibo, 5·43 per cent.; Pln. Johanna Cecilia, Aroabisce Coast, Essequibo, 5·49 per cent.; Pln. Aurora, Aroabisce Coast, Essequibo, 6·86 per cent.; and Pln. Spring Garden, Aroabisce Coast, Essequibo, 6·23 per cent.; and, finally, Pln. Friends, East Bank, Berbice, 4·31 per cent.

6. His Excellency the Governor has, I believe, already referred to Dr. Shier for enquiry and report the extracts from the registers of deaths submitted by me some time since as to Plantations Wales, Spring Garden, Aurora, and Johanna Cecilia. I now submit similar extracts herewith, as to Plantations Philadelphia, Cullen, and Friends, with a view to investigation similarly. It may, I submit, be found desirable that some of these plantations should be, at least temporarily, restricted to the employment of fully acclimatized labourers, and that immigrants should not, consequently, be sent to them, on arrival, to be acclimatized.

7. I do not consider that any of the other plantations require to be specially noticed.

8. It will be observed that the total number of immigrants accounted for by the consolidated return is 37,510 males, and 14,888 females; of whom 2,825 males, and 10,881 females are East Indians from Calcutta, the remainder consisting of Chinese, Madrassees, persons of African descent, and a few Maderians, and that the general average of mortality during the half-year was 1·64 per cent.; that during the year being at the rate of 3·06 per cent. per annum, or a little over thirty in the thousand.

9. I may here observe that with all the endeavour to obtain perfect accuracy in the returns, they are still, I believe, nevertheless only close approximations, and that it will be necessary shortly so to simplify and perfect the form of the half-yearly return as to make it comprehensive and capable of being readily and reliably filled up. It has, I fear, in the course of years, become too complicated.

10. It may be desirable and interesting to point out here that the rates of mortality shown by the consolidated returns for the past five years have been—

1865	...	...	... 5·4	per cent.
1866	...	...	... 4·39	,,
1867	...	...	... 4·13	,,
1868	...	...	... 2·9	,,
1869	...	...	... 2·84	,,

against 3·06 in 1870; while against 1·64 per cent. for the half-year ending 31st December last there stands—

For the half-year ending 31st December		1865	... 2·72	per cent.
,,	,,	1866	... 2·16	,,
,,	,,	1867	... 2·06	,,
,,	,,	1868	... 1·58	,,
,,	,,	1869	... 1·4	,,

which is, I submit, taken altogether, a very cheering comparison.

11. In presence of the report of the "Commissioners appointed to enquire into the treatment of immigrants in British Guiana," now no doubt under His Excellency's consideration, it is I think unnecessary for me to trouble your Excellency with any further remarks.

From GEORGE BERKELEY, ESQ., Lieutenant-Governor, St. Vincent, to His Excellency Governor RAWSON, C. B., &c., &c.,—No. 40, dated St. Vincent, the 9th May 1871.

I HAVE the honor to transmit to your Excellency the report of the Immigration Agent for the half-year ended 31st December 1870.

2. The Immigration Agent explains the cause of the delay that has occurred in forwarding the report upon the present occasion.

3. It is gratifying to perceive that the apprehensions which were naturally raised by the malfeasance of the late Agent as to the present working of the system in this colony, are unfounded, and that no serious grounds for complaint existing with respect to the condition and treatment of the immigrants.

From J. D'OYLY, ESQ., Immigration Agent, to the Acting Colonial Secretary,—dated St. Vincent, the 3rd May 1871.

I HAVE the honor to forward my report on the state of immigration in this colony to 31st December 1870.

I have visited since my appointment to the office of Immigration Agent all the estates on which indentured Indian immigrants are located, and made the necessary inquiries as to treatment and general state of the coolies thereon.

No grave cause of complaint came under my notice. On some estates the state of the houses were complained of, which, on inspection, I found were warranted, and I instructed the several managers to have the necessary repairs done.

Complaints were also made as to the amount of wages paid, the coolies stating that they did not get paid in proportion to the work done, but, on examining the pay lists, I found the amount of work performed duly entered and paid for, and, on questioning their own countrymen, am satisfied that it was only in cases where the coolie was lazy or physically incapable of performing his task that the money earned was small; the industrious and strong always earning and receiving a fair day's wage.

In some instances the superintendent and overseer were accused of treating coolies roughly, and although these complaints were not substantiated, I thought it advisable, where they occurred, to direct the manager to warn his subordinates never to touch one of the immigrants, but to refer to him any case of delinquency on the part of the coolie.

The medical attendance appears to have been regular on the several estates, but, in some instances, the doctor's visits appear to have been very hurried; the immigrants complaining that they had no opportunity of stating their ailments on account of the short stay of the doctor on the estate. No doubt the complaints of many were not warranted, but I requested Dr. Checkley and Dr. Cumming on their next visit carefully to examine all who were really sick and fancied themselves so, which I understand was done.

The number of births during the past half-year amount to 30, as per Schedule A, exceeding the deaths by 13.

The number of deaths for the same period was 17. The sexes and nature of disease are shewn in Schedule B.

The amount of crime among the Indian immigrants is shown in Schedule D. Breaches of contract appear to have been of more frequent occurrence than formerly; this is, in some measure, attributable to the excitement among the coolies owing to the investigation of the cases of cruel treatment on Argyle Estate. Only one long term of imprisonment was inflicted during the half-year in a case of stealing, *viz.*, 18 months.

There appears to be a discrepancy in the number of Indian immigrants as compared with former reports of my predecessor. The numbers named in Schedule C are in accordance with the half-yearly returns sent in by the managers, which appear to be correct. On my next visit to the estates I intend to make an accurate list of all Indian immigrants, whether free or indentured, so that in future there can be no possibility of mistake in the actual numbers.

According to clause 3 of Act No. 158, the coolie labourer is entitled to receive two pence per hour for extra work. I am of opinion that this clause works injuriously both to employer and employed; coolies appear to prefer work about the buildings in crop time, but as Creole labour can be obtained at a less rate than that payable to the coolie, the managers do not care to employ the latter. But on some estates I found that coolies were employed about the works, willingly accepting the same rate as paid to Creoles, the wages paid being from 30 to 36 cents per day. Where objection was made to accept this rate, the coolie was at once transferred to field work where he cannot earn so much. I think it would be wise to allow the employer and coolie to settle the amounts to be paid for extra work between themselves; of course on the understanding that in no case shall the rate of payment be less than to a Creole labourer of equal ability.

This report has necessarily been delayed on account of the confusion arising from the abrupt departure of the late Immigration Agent, and the fact of the shipping away of those immigrants entitled to back passage at the time that the several estates should have been visited. I will endeavour to make my report for the half-year ending 30th June next much earlier, and, I trust, more comprehensive.

From Sir T. W. C. Murdoch, to R. G. W. Herbert, Esq., &c., &c., &c.,—dated Emigration Board, the 9th June 1871.

I have to acknowledge your letter of the 2nd instant, with a despatch from the Governor of British Guiana, enclosing the report of the Immigration Agent for the six months ending 31st December last.

2. It appears from this report that the number of immigrants working on estates on 31st December was—

	Males.	*Females.*	*Total.*
Under indenture	29,870	10,006	39,876
Not under indenture	7,640	4,888	12,528
	37,510	14,894	52,404

being, as the Governor says, an increase, as compared with 1869, of 3,568 males and 1,593 females. As compared, however, with 30th June 1870, there is an increase of 20 in the number of males, and a decrease of 220 in the number of females. The births had been at the rate of 2·31 per cent., the deaths at the rate of 3·06, which is a slight increase on the rate of the previous two years, which was 2·84 and 2·92, respectively. This increase the Governor attributes to the number of new immigrants introduced in 1869-70, adding that, by a recent return, it appears that the mortality among immigrants who have been less than two years in the colony is as high as 5·48 per cent. It follows that the mortality among acclimatized immigrants is proportionately below the general rate given above. Upon this point, I would beg to refer to my report of 30th December last. Considering the peculiar circumstances of cooly immigrants, a mortality of 30 per 1,000 cannot, I think, be considered unsatisfactory.

3. The Governor reports that on four estates* the mortality has been more than double the average mortality of the year and of the previous five years, and that these estates would, therefore, under the rule laid down by Earl Granville, be excluded from allotments of fresh immigrants. On three of these estates, the average mortality has, the Governor says, been always high, and

* Spring Garden, Aurora, Belle Vue, Wales.

he regards them, therefore, as permanently unhealthy. He proposes, however, under the direction entrusted to him, not to enforce Lord Granville's rule against them at once, waiting, in the case of Spring Garden Estate, which has the highest death-rate, to see the effect of some improvements undertaken by the proprietor. I cannot think that this is a right conclusion to come to. The refusal to allow new immigrants will, no doubt, be very injurious to the estate; but, on the other hand, the allotment of them to estates proved to be permanently unhealthy, is knowingly to assign a proportion to almost certain death. The proprietors of such estates must, I think, be left, till they can improve their sanitary condition, to obtain labourers among old immigrants who are acclimatized, are free to accept or refuse the service, and have the means of knowing the circumstances of the estate. The estates to which this rule, if the Earl of Kimberley should approve it, would apply, are Spring Garden, Belle Vue, and Wales. On Aurora Estate, although the mortality in 1870 was large, it has in other years been moderate. It may be hoped, therefore, that it was the result of exceptional circumstances last year.

4. The Governer assumes that in applying Lord Granville's rule, the rate of mortality is to be calculated on the whole number of immigrants working on the estate, without reference to the date of their introduction; but that the refusal to assign is to apply only to new immigrants,—I presume that his interpretation is correct on both points. The calculation of the rate of mortality is to ascertain the healthiness of an estate, or the contrary; and a large mortality among old immigrants would be a greater proof of unhealthiness than an equal mortality among new. At the same time, it is only new immigrants whom the Government is especially bound to protect against assignment to an estate where the mortality has been large. Immigrants who have completed their industrial residence are less likely to suffer from local influences, and are generally able to judge for themselves whether it is for their advantage to engage on a particular estate.

From Sir T. W. C. Murdoch, to R. G. W. Herbert, Esq., &c., &c., &c.,—dated Emigration Board, the 20th June 1871.

I have to acknowledge your letter of 17th instant, with a despatch from the Lieutenant-Governor of St. Vincent, enclosing the report of the Immigration Agent of that Island to 30th December last.

2. This report has been delayed by the circumstances under which the predecessor of the present Agent vacated his office. It shows that the number of Indian immigrants in the colony on 31st December last was 1,227; that the births in the half-year had been 30, the deaths 17. The mortality was therefore at the rate of 27 per 1,000 per annum. The work performed was equal to 101·688 days, or not quite 83 days in the six months for each immigrant. The days lost through sickness, holidays, or idleness were 64·444 equal to 52½ per head; the earnings amounted to an average of $ 15·75 each. Some complaints were made as to insufficiency of wages, but, on investigation, were found to be unreasonable, and complaints of harsh treatment were in the same way not substantiated. The Immigration Agent suggests that instead of the provision in the Immigration Act prescribing the amount to be paid to coolies for extra work, the cooly and the employer should be allowed to fix the amount by private agreement, but not lower than the amount paid to a Creole labourer of equal ability. I see no objection to this arrangement, but its expediency is obviously a matter for the consideration of the local authorities.

20th June 1871, Chairman, Emigration Board, to Under Secretary of State, C. O.

There is nothing else in this report that appears to me to require notice.

From the Earl of Kimberley, to Governor Scott, &c., &c., &c.,—No. 141, dated Downing Street, the 30th June 1871.

With reference to your despatch No. 65 of the 2nd ultimo, transmitting the report of the Acting Immigration Agent General for the last half-year, I transmit to you the enclosed copy of a report* from the Emigration Commissioners. As I have allowed you a discretion for the present in the application of the rule laid down by Earl Granville respecting the allotment of fresh immigrants to unhealthy estates, I will not interfere with that discretion on this occasion; but I desire to remind you that, in the exercise of it, you should keep in view that the temporary disadvantage to an estate, which might be caused by the refusal or suspension, of an assignment of fresh immigrants, ought not to be allowed to weigh against the necessity

* 9th June 1871.

of preserving the immigrants from being sent to a locality dangerous to their health, and that it will be better to err on the side of protection to the immigrants than of advantage to the estates, as a very serious responsibility will rest upon the Government if a fresh allotment of immigrants is made to a permanently unhealthy estate, in which category, I think that Spring Garden Estate must at present be classed.

From the EARL OF KIMBERLEY, to GOVERNOR RAWSON, C. B., &c., &c., &c.,—No 54, dated Downing Street, the 3rd July 1871.

I HAVE received Lieutenant-Governor Berkeley's despatch No. 40 of the 9th of May, enclosing the report of the Immigration Agent in St. Vincent for the half-year ending the 31st of December 1870.

I transmit to you a copy of a report by Sir Clinton Murdoch on these papers.

In regard to the suggestion of the Immigration Agent that the law should be amended so as to permit the employer and the coolie to fix the wages for extra works by private agreement I am not disposed to dissent from Sir C. Murdoch's opinion that the experiment of allowing such agreements may be tried if the Local Government think it expedient; but if the amendment in question be made, its working should be narrowly watched, as I cannot but feel some doubt whether a coolie would be able to secure from his employer a fair equivalent for his labour, as compared with that of a Creole of "equal ability."

The Cotton Trade between the Nerbudda Valley and Calcutta.

From HARRY RIVETT-CARNAC, ESQ., Cotton Commissioner, to the Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce,—No. 5428, dated Allahabad, the 4th October 1871.

I HAVE the honor to acknowledge the receipt of your letter No. 5, dated 13th July, regarding the trade in cotton between the Nerbudda Valley and Calcutta, and desiring me to investigate the matter and to report the result of my inquiries, for the information of His Excellency the Viceroy and Governor General in Council.

2. I would now desire to report that, on this subject being brought to my notice, early in the year, I caused inquiries to be made, and that ascertaining, as will be explained in a later paragraph, that the exports alluded to by the Officiating Chief Commissioner of the Central Provinces were inconsiderable and admitted of satisfactory explanation, I did not pursue the subject further. On the receipt, however, of your despatch under acknowledgment, it appeared desirable to obtain the latest information on the subject for transmission to the Government of India, and, as I was on the eve of starting for a tour in the Central Provinces and the Berars, I delayed a detailed report, until I could re-visit the cotton districts, and obtain from the Railway Companies the tabulated statements of traffic, taking up, at the same time, the whole question of the trade of the Central Provinces with Bombay and Calcutta,—a subject which has been treated of at length in my memorandum, copy of which was submitted with my letter No. 5312, dated the 25th ultimo. These circumstances will, I trust, account for the delay in replying to your despatch under notice.

3. Further inquiry has confirmed me in the view that, although some trade in cotton does doubtless continue to exist between the Nerbudda Valley and the East, still that there is no ground for supposing that the trade is "shifting towards Calcutta;" but that, on the contrary, this trade with the East is on the decline, having been affected already by the completion of the main line of Great Indian Peninsula Railway between Bhosawul and Jubbulpore. Nor, indeed, unless I read the letter incorrectly, do I understand Colonel Keatinge to desire to convey that the trade is shifting towards the East. The Officiating Chief Commissioner noticed that cotton was being sent from the neighbourhood of Nursingpore in the Nerbudda Valley, to Calcutta, which place is much further from Nursingpore than is Bombay, and this circumstance very naturally struck him as being peculiar. But, as I shall now attempt to show, the quantity sent from this quarter to the East was not larger than that sent in former years, whilst the existence of a trade between the Nerbudda Valley and Mirzapore and Calcutta is a circumstance that can be readily explained.

4. First, in regard to the quantity of cotton sent from the Nerbudda towards the East during the past season. The following figures of the traffic by road have been furnished to me by Mr. Grant, Commissioner of the Jubbulpore Division:

Statement of the cotton exported by road over the outer boundary of the Jubbulpore Division, during the following months of 1871.

January.	February.	March.	April.	May.	June.	Total.
Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
492	710	3,404	2,340	2,528	574	10,048

Total maunds 10,048,* or about 2,000 bales of 400 lbs. each. The traffic ceased altogether at the commencement of July.

5. Now, these exports by road were not made up exclusively of cotton sent from the Nurbudda Valley, but included all cotton sent eastward by road from the Central Provinces and Berar cotton-growing country. Some quantities were sent even from Oomraotee to Mirzapore, as explained in a foot-note of my memorandum on the railway traffic already referred to—

> "This year, even a consignment of Oomraotee cotton was sent from Oomraotee to Mirzapore on bullocks by a Brinjaree Naik of Berar, who not caring to keep his bullocks idle, loaded them with cotton, and brought back sugar and brass-ware from Mirzapore."

And the whole quantity sent by road, of which the Nerbudda consignment formed but a part, amounted to only 10,048 maunds, or 2,000 bales of 400 lbs. each, or, in other words, from 700 to 1,000 cart-loads.

6. The quantities of cotton sent from the Nerbudda Valley eastward by railway, from the 1st of January 1871 to the 30th of June, were as follows:

	To Cawnpore.	To Mirzapore.	To Buxar.	To Calcutta.	TOTAL.
Khandwa	...	56	...	...	56
Garrawara	...	156	...	...	156
Nursingpore	...	315	...	...	315
Chindwarrah	...	512	...	136	648
Jubbulpore	2	5,258	15	6,970	12,245
TOTAL MAUNDS ...	2	6,297	15	7,106	13,420

or about 2,700 bales of 400lbs each. Adding these figures to the exports by road already given, we have a total of 23,471 maunds, or 4,700 bales, sent eastward by road and railway during the season.

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* The maunds used throughout are of 82 lbs. each.

7. The figures given below shew the exports of cotton in maunds in this direction during former years:

	1865-66.	1866-67.	1867-68.	1868-69.	1869-70.
By road	75,000	41,353	38,645	21,104	12,525
By rail	...	17,403	10,652	4,249	13,654
TOTAL MAUNDS ...	75,000	58,756	49,297	25,353	26,179

And these figures would seem to indicate a gradual falling off, for reasons to be noted later, in a once important trade.

8. That some trade in this staple should continue to exist between the eastern part of the Central Provinces, is only natural from the following circumstances. In the first place, it is to be remembered that, until quite recently, the whole trade of this tract was with Mirzapore and the East. Until the completion of the railway, not only the Nerbudda Valley, but even the old Nagpore Province and some portions of the Berars, were entirely cut off from Bombay, and, consequently, transacted the whole of their business with Mirzapore and the North-West Provinces. To Mirzapore the cotton of that part of the country used to be sent, and in exchange, copper, spelter, sugar, European piece-goods, and the comprehensive *kerana* of the natives used to be imported by such trading towns as Jubbulpore, Nagpore, Hingunghât, and Oomraotee.

9. The large firms whose head-quarters are at Mirzapore had, and in many cases still have, their agencies at these towns, with subordinate branches in all the circles of supply of which these towns are the trade centres. And, as explained in my letter on the Wurdah Valley Railway, the cultivators being under advances to the agents of these firms, the produce is gathered in and disposed of by the mahajuns who have been for long years in the habit of sending annually large consignments to Mirzapore. In the Berar country, the effect of the opening of the railway communication with Bombay has been to induce some of the Mirzapore firms to open branches at Bombay. The native agents in the up-country markets send down the cotton to that port, or sell it on the spot to the European agents who are now established at all the marts to the south of the Southpoorahs, and who supply the European firms in Bombay.

10. In the Nerbudda Valley the state of the case is somewhat different. The completion of the main line of the Great Indian Peninsula Railway on the north of the Southpoorahs is of such recent date, that the effect has not yet been fully felt, and the trade thus still continues to run to some extent in its old channel. But every thing seems to indicate a change which is not likely to be long deferred.

11. The following extract from the letter of Mr. LeMesurier (Agent of the Great Indian Peninsula Railway), to the Chamber of Commerce, Bombay, given in the Appendix to this Report, explains still more fully the reasons for the exports towards the East. Mr. LeMesurier says:

> "I was at Garrawarra myself about the date referred to in Colonel Keatinge's letter, and I had a conversation with the agents who were sending their cotton by cart from near Garrawarra to Mirzapore. The reason assigned by them was, that if the bullocks and carts thus occupied were not employed at that particular time in going to Mirzapore, they would be at home idle, as there was no work for them, and that the saving between sending by rail from Garrawarra to Mirzapore *viâ* Allahabad, or by cart *viâ* Meyhere and Rewah to Mirzapore, was equal to eight annas a doora only,—time being as of no value; and they contrived to return from Mirzapore with merchandize for Rewah and other places on the road.
>
> "Mirzapore, as the Chamber is well aware, is the mart to which all the Central Province produce has found its way for very many years; and the agencies are so firmly established—the whole trade being in the hands of the Hindoos—that we cannot possibly alter the course of such trade in one season, particularly as boats on the Ganges are even now competing with the East Indian Railway as carriers of cotton from Mirzapore to Calcutta."

12. There is yet another reason for the cotton of Central India finding its way to the East. Of late years, cotton-spinning and weaving mills, worked by steam power, have been established at Cawnpore and in the neighbourhood of Calcutta. A certain percentage of cotton of a superior quality is required in these establishments for the finer class of goods manufactured there; and the cotton of the Central Provinces suits this want exactly. The consequence is, that consignments of cotton are annually sent, not only from the Nurbudda Valley, but also from Hingunghât, to these mills. The figures of the exports for the past two seasons are given below:

	1869-70.	1870-71.
	Cawnpore.	Cawnpore.
Wurdah	1,649	3,670

And the figures given in paragraph 6 of the exports to Calcutta are, to a great extent, to be accounted for by the requirements of the mills there.

13. And, lastly, the cotton of the Nerbudda Valley—a cotton rougher in substance and shorter in staple than that grown south of the Southpoorahs—is in great demand for the China market, as will be seen from the following extract from the letter of the Bombay Chamber of Commerce given in the appendix. The Secretary writes:

> "The Chamber are further of opinion that the white short-stapled cotton grown in those districts of the Central Provinces and the North-West of India, which is suitable for, and principally exported to, China, will continue to find its way to Calcutta as the chief port for the export of Indian cotton to China.
>
> "Seventeen and twenty years ago, about a third of the quantity of the cotton exported from Bombay went to China. All this is now changed; and though the quantity of cotton exported from Bombay has, within half the period, more than doubled, the portion now exported from this port to China is an inconsiderable item in the aggregate quantity."

14. To what extent the cotton trade done by Calcutta and Bombay with China is still sustained, will be seen from the figures given below; and it is to be noted that whenever the price of cotton in Europe falls, the demand for Indian cotton for export to China is comparatively brisk.

Exports of cotton to China during the following years reduced to bales of about 400lbs. each.

	TOTAL EXPORTED TO ALL PORTS.		EXPORTED TO CHINA.	
	To 30th June.		To 30th June.	
	1870.	1871.	1870.	1871.
Calcutta	59,502	1,54,300	24,502	51,304
Bombay	8,12,220	8,84,044	35,785	39,628

15. The above remarks will, I hope, shew that the exports of cotton from the valley of the Nerbudda, noticed by the Officiating Chief Commissioner, were not caused by any extraordinary turn in the trade, but were the results of a long-established trade which, under ordinary circumstances, is not likely to be entirely diverted for some time to come.

16. But, on the other hand, as regards the quantity sent from the Nerbudda Valley towards Bombay, the following figures will speak for themselves:

Quantity of cotton exported to Bombay from the Nerbudda Valley in bales of 400lbs.

1867-68.	1868-69.	1869-70.	1870-71.
12,000	11,800	11,000	23,200

The increase, it will be seen, is marked, and is doubtless to be attributed to the opening of through communication by railway.

17. I have purposely included in the columns given above, the stations of Nimar, which are just beyond the Nerbudda Valley, as it may be assumed, not unfairly, that much of the cotton of the valley was sent to these stations before the through line was opened by His Excellency the Viceroy in April 1870. Some of the cotton shewn in the above statement comes from Central India, and strikes the railway at Khundwah; but the figures of these exports have been retained as they are included in former statements.

APPENDIX.

From JAMES TAYLOR, ESQ., Secretary, Chamber of Commerce, Bombay, to the Cotton Commissioner, Berars and Central Provinces,—dated Bombay, the 23rd August 1871.

I HAVE to acknowledge the receipt of your letter of the 17th instant, on the subject of the export of cotton from the Nerbudda Valley to Mirzapore, brought to the notice of the Chamber by the Chief Commissioner, Central Provinces, in February last.

In reply, I have the pleasure to enclose herewith copy of a letter to the Chamber on this subject, from the Bombay Agent of the Great Indian Peninsula Railway, which will afford you all the information that can be given on the subject. The committee consider that Mr. LeMesurier's letter gives a satisfactory explanation of what had been observed by the Chief Commissioner; and they are further of opinion, that the white short-stappled cotton, grown in those districts of the Central Provinces and the North-West of India, which is suitable for, and principally exported to, China, will continue to find its way to Calcutta as the chief port for the export of Indian cotton to China.

Seventeen and twenty years ago, about a third of the quantity of the cotton exported from Bombay went to China. All this is now changed; and though the quantity of cotton exported from Bombay has, within half the period mentioned more than doubled, the portion now exported from this port to China is an inconsiderable item in the aggregate quantity.

From H. P. LEMESURIER, ESQ., Agent, Great Indian Peninsula Railway Company, to the Secretary to the Chamber of Commerce, Bombay,—No. 2097, dated Bembay, the 20th March 1871.

I HAVE the honor to acknowledge the receipt of your letter of the 13th instant, with accompaniment, regarding the despatch of cotton from the Nursingpore Districts to Calcutta.

2. I was at Garrawarra myself about the date referred to in Colonel Keatinge's letter, and I had a conversation with the agents who were sending this cotton by cart from near Garrawarra to Mirzapore. The reason assigned by them was that, if the bullocks and carts thus occupied were not employed at that particular time in going to Mirzapore, they would be at home idle, as there was no work for them; and that the saving between sending by rail from Garrawarra to Mirzapore *viâ* Allahabad, or by cart *viâ* Meyhere and Rewah to Mirzapore, was equal to eight annas a docra only,—time being as of no value; and they contrived to return from Mirzapore with merchandize for Rewah and other places on the road.

Mirzapore, as the Chamber is well aware, is the mart to which all the Central Province produce has found its way for very many years; and the agencies are so firmly established—the whole trade being in the hands of the Hindoos—that we cannot possibly alter the course of such trade in one season, particularly as boats on the Ganges are even now competing with the East Indian Railway as carriers of cotton from Mirzapore to Calcutta.

I was told at the same time that this cotton was intended for China; and if this statement was correct, the following singular system was at that time obtaining. Cotton was going eastwards from Garrawarra for China *viâ* Calcutta at the same time that other cotton was coming westward from Agra for the same destination *viâ* Bombay.

State of the Weather and prospects of the Crops in West Berar.

From A. J. DUNLOP, ESQ., Assistant Commissioner, Sheagaon, to the Cotton Commissioner,—No. 836-153, dated the 11th October 1871.

* * * * * * *

There has been no rain during the week, and the weather has become more than usually hot. The crops in this part are looking tolerably well. The cotton plants are getting into flower, and although they would be the better of rain to stimulate their growth, no anxiety need be felt on their account. The jowaree also requires a little more rain to bring it on.

In the neighbourhood of Ballapore, and further East, where I have lately been, the crops are not so good, and, without rain, will not come to much. The cotton plants in many fields in that direction are only from nine inches to one foot high, and without a good supply of rain, cannot be expected to bear fruit to any extent. In that part of the country the jowaree is only half the size it should be. In the northern portion of the District, the crops are reported to be good.

Rain is most urgently required for the autumn sowings, which should now be going on; but, under the present circumstances, it would be mere waste to put the seed into the ground.

The area reserved for the late sowing is somewhat larger this season than usual, owing to the decrease in cotton cultivation caused by the June sowing having failed; and considerable uneasiness is felt by the cultivators who have specially been looking forward to the rubbee crop to make up for any loss they may have sustained in the early part of the season. There are at present no signs of the approach of rain unless the excessive heat we are suffering is over.

The grain market has, in the last few days, risen considerably. Jowaree is now selling for 19 seers per rupee, and a still further rise is expected by the Natives.

I am glad to say the model farm compares favorably with the surrounding fields, and we are now reaping the benefits of good ploughing, the roots of the plants having penetrated deeper into the soil, consequently getting more moisture than those near the surface.

The early sown cotton will soon be ready for picking: the later sown requires more rain to bring it on.

The season is a very unfortunate one for our experiments with the minor crops—the sorgo, maize, sugar-cane, and rice alone requiring more water than we can well give them.

The rain-fall up to date is 11·90 inches against 24·78 up to the same date last season, being a decrease of 12·88 inches.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

IRRIGATION OPERATIONS OF FUSL KHURREEF IN THE NORTH-WESTERN PROVINCES UP TO 31st AUGUST 1871.

CANAL DIVISIONS.	WATER DISTRIBUTED DURING THE MONTH. Depth in Canal at Regulating Gauge. Full supply, feet.	Actual throughout, feet.	Gross Consumption, cubic feet per second. Estimated full discharge.	Actual average throughout.
Ganges Canal. Northern ..	The Ganges Canal having been closed up to the 29th of the month, details of gauges, &c., are not given.			
Meerut ..				
Futtehgurh ..				
Boolundshuhur ..				
Allygurh ..				
Etawah ..				
Cawnpoor ..				
Eastern Jumna Canal ..	..	3·00	..	605
Doon Canals ..	..	..	..	97
Bundelkhund Irrigation Works ..	..	..	..	..
Rohilkhund Canals ..	..	..	..	127
GRAND TOTAL ..	..	..	..	829

NAVIGATION RETURN, GANGES CANAL. *Principal Items of Traffic.* Nature of Traffic.	Up. Mds.	Up. No.	Down. Mds.	Down. No.	Total Up and Down. Mds.	Total Up and Down. No.
Grains—						
Wheat ..	..	..	822	..	822	..
Urhur ..	..	..	125	..	125	..
Barley ..	..	..	38	..	38	..
Bhajhur ..	..	..	40	..	40	..
TOTAL ..	..	..	1,025	..	1,025	..
Cotton ..	..	..	..	..	..	..
Oil-seeds ..	..	..	..	..	..	..
Salt ..	..	..	..	..	..	..
Metals ..	..	..	..	..	..	..
Building materials ..	..	..	11,756	..	11,756	..
Miscellaneous goods ..	..	..	..	..	..	..
Firewood ..	..	..	550	..	550	..
Bamboos ..	..	..	..	..	..	..
Tores or unsquared timber ..	..	..	..	..	..	..
Kurrees, or squared timber ..	..	..	..	..	..	..
Logs ..	..	..	..	..	..	..
Miscellaneous timber ..	..	..	..	..	..	..
Live-stock ..	..	..	..	..	..	..
GRAND TOTAL ..	..	..	13,331	..	13,331	..
Fusl Khurreef, 1870-71 to 31st Aug. 1870 ..	496	..	450	50	946	50
Decrease, 1871 ..			..	..	..	50
Increase, 1871 ..			..	..	12,385	..

LAND IRRIGATED (APPROXIMATE). Zillah.	Acres.
Saharunpoor ..	27,547
Mozuffernuggur ..	41,635
Meerut ..	58,328
Boolundshuhur ..	29,504
Allygurh ..	41,239
Muttra ..	5,321
Agra ..	454
Etah ..	11,122
Mynpoorie ..	9,625
Futtehgurh ..	6,334
Etawah ..	13,524
Cawnpoor ..	19,082
Dehra Doon ..	5,116
Bijnour ..	381
Terai ..	4,608
Bareilly ..	9,563
Jhansie ..	81
Humeerpoor ..	287
TOTAL ..	283,751
Total up to corresponding date of fusl khurreef, 1870-71 ..	314,562
Decrease, 1871 ..	30,811

RAIN-FALL. Total from 1st April 1871, to 31st August 1871.	Average of ten previous years for the same period.
43·7	29·17
29·5	22·76
27·2	20·81
21·7	16·51
27·6	20·61
34·5	20·67
34·9	20·24
22·0	21·95
35·0	24·29
29·6	23·9
36·0	23·1
25·2	23·2
93·9	60·3
35·7	24·7
69·4	24·9
46·8	31·0
35·6	28·7
33·0	25·9
..	..
..	..
..	..

REMARKS.

GANGES CANAL.

The canal was closed for repairs during the month, and was only re-opened on the night of the 28th.

The rains throughout the districts watered by this canal, have greatly exceeded the average fall for the past ten years; and there was in consequence no demand for water during the month.

EASTERN JUMNA CANAL.

This canal was closed from the 11th to the 26th of the month to admit of drainage and spring-water being passed off. There was little or no demand for water during the early part of the month, but towards its close the demand became general for rice, and in the lower parts for cotton and Indian corn.

DOON CANALS.

The Kutta Puthur Canal was closed throughout the month to admit of repairs. The demand for rice was fair and well-sustained throughout the month. Rainfall is in excess of average for the past ten years.

The Ganges Canal having been closed for repairs for nearly the whole month, there was no "up" traffic and very little "down."

ALLAHABAD;
The 3rd October 1871.

P. S. MARINDIN, *Capt., R. E.,*
Offg. Asst. Secy. to Govt., N. W. P., Irrigation Branch.

EXTRA SUPPLEMENT

TO

The Gazette of India.

CALCUTTA, WEDNESDAY, OCTOBER 25, 1871.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

PAPERS RELATING TO IRRIGATION WORKS IN ORISSA.

CALCUTTA:
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1871.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

PAPERS RELATING TO IRRIGATION WORKS IN ORISSA.

Memorandum by LIEUTENANT COLONEL F. H. RUNDALL, R. E., *Chief Engineer, Bengal Irrigation Department, accompanying the submission of the Plans and Estimates of the various works comprising the Orissa Project as designed and executed by the East India Irrigation Company.*

CHAPTER I.

The series of irrigation and navigation works about to be described are those which have lately been purchased by the Government from the East India Irrigation Company, and are known as the Orissa Project.

Introductory observations.

This scheme originated in consequence of a report on the condition of the Province of Orissa made by Sir A. Cotton so far back as 1858, when he was ordered by the Government of India to proceed to Cuttack for the purpose of reporting on the measures necessary to save the city from the destruction with which it was then threatened from the river Mahanuddy, or rather from that branch of it called the Katjooree, which had begun to undermine the old Mahratta revetment that surrounds the city.

While on this duty, Sir A. Cotton's attention was attracted to the condition of the districts comprising the Cuttack Commissionership, and finding that they were very similarly circumstanced to those districts bordering the Godavery, where the great scheme of irrigation works had begun to yield such valuable results, he recommended the Government to consider the propriety of entering upon a similar series of works for Orissa.

While the subject was occupying the attention of Government, the Irrigation Company, who had been encouraged to commence operations in Madras, offered to carry out a scheme in Orissa on the basis of Sir A. Cotton's recommendations. After considerable discussion, the offer of the Company was accepted, and a contract entered into with them for a scheme of works combining irrigation with navigation, one of the main features of which was to open continuous water communication between Cuttack and Calcutta.

In order to assist the Irrigation Company in designing and starting their scheme, the Government of India were pleased to place my services at the Company's disposal to act as their Chief Engineer. I remained with them in that capacity nearly five years, and during that period the various works hereafter to be described were designed and put in hand, and have now reached various degrees of completion.

Now that the works have become Government property, and the Governor General in Council has pronounced it to be requisite that the scheme as originally designed should be reviewed in all its details, and the calculations tested, it will be necessary for me to commence from the beginning, and, after explaining the principles on which the scheme, as a whole, is based, proceed to describe in detail each series of works of which it is composed. In doing this, of course much that has been previously written and laid before the Government will unavoidably have to be repeated.

The area originally contemplated to be embraced by this scheme comprises the five alluvial districts contained between the frontier in the district of Ganjam belonging to the Madras Presidency and the river Hooghly near Calcutta, and contains about 6,000 square miles. This tract of country consists chiefly of a succession of deltas formed by the several rivers which flow through it.

Limits of scheme.

Poorce. | Balasore.
Cuttack. | Midnapoor.
Hidgellee.

From the Chilka Lake to Balasore the chain of the eastern ghauts runs more or less parallel with the coast line, being 60 miles distant from it at the point where the river Mahanuddy first debouches on the plains, and approaching it within 15 miles again at Balasore.

In Sterling's History of Orissa it is stated that the Mahrattas, who, in the course of their career of conquest through India, found their way to Orissa, being enchanted with the multitude of its temples, its beautiful groves of trees, the number of rivers by which the country was traversed, and the appearance of fertility which its great rice plains presented, pronounced the country to be one continual "Tirth" or scene of festivity. However, notwithstanding these evidences of apparent prosperity, the history of Orissa during the past century shows it to have been the scene of periodical distress, and subjected to those visitations which are common more or less to all the deltas of Southern India, and which generally culminate in some such overwhelming calamity as that which lately befell that province.

Condition of Orissa during the past century.

Extreme drought in one year deprived it of food. Extreme flood in the succeeding year destroyed the hope of the anxiously expected harvest. Its isolated position, from want of proper communications, aggravated those calamities by placing it beyond the reach of succour from localities which could have ministered to its wants.

It was with the view of preventing such calamities, by using the experience gained in similarly circumstanced provinces, that the scheme of the Orissa Works was planned.

In the year 1862, when the Irrigation Company first commenced its operations, the only means of communication with Orissa were by what was called the Grand Trunk Road, which was at that time little more than in a state of formation, and consisted of high earthen embankments, in many places not consolidated, with no metal covering, and but few bridges. Consequently, during the rainy season, the post from Calcutta was often ten days in transit, the telegraph wires when most required were carried away at the river crossings, and Orissa became to all intents and purposes cut off from the rest of India.

Its isolation.

It is true there was the safe and convenient, though small, harbour of False Point, but vessels rarely resorted to it, and it was with great difficulty that ships could be chartered in England to bring out the machinery for the Irrigation Company's works, owing to there being no information obtainable about the port. Beyond the fact that there was a lighthouse erected to warn everybody off the coast, nothing was known; and when at last the first two ships did venture there, it was with the greatest difficulty that the Commanders could be induced to bring their vessels within the sheltered port, instead of remaining anchored out in the open roadstead From its having been so rarely visited, no cargo boats were procurable; and as the only boats available were a small cutter and lighter, belonging to the Lighthouse Superintendent, almost everything had to be landed at much risk in river boats sent down all the way from Cuttack. Had not the Mahanuddy fortunately been navigable for boats of very small draught, there would have been no possibility of bringing up any of even the lighter stores. The greater part of the heavy machinery had to be landed at the head of the tidal reach of the river, and to be kept there till the rainy season, when the rising of the river would admit of suitable boats being despatched for it.

Such was the isolation of the province. Its whole trade* was crowded into the six dry months of the year, when carts dragged by unusually small cattle could find their way either to Balasore, 120 miles distant, where there was a small export trade carried on by country craft, or else to the Hooghly, 200 miles distant, whence it was conveyed to Calcutta. That trade, as may be supposed, was perfectly insignificant, and the consequence very apparent in the total absence of any indication of wealth amongst either the merchants or zemindars, while the mass of the people were wretchedly poor.

But little money had up to that time been expended in public works in Orissa. Endeavours had been made to improve the existing lines of embankments, but as the system on which they had been originally designed was very defective, it followed that in such floods as overtook the country in the years 1862 and 1866, the embankments afforded only a limited protection.

Principles to be observed in projecting the works.

The three leading principles to be observed in projecting works for Orissa were thus made clear:—

1*st.*—The country must be provided with means to prevent the recurrence of drought.
2*nd.*—Its harvest must at all times be protected from liability to destruction from floods.
3*rd.*—Lines of communications must be constructed to connect its districts with the seaboard, with one another, with the great market of Calcutta, and with the seat of Government.

The question for consideration then became—How could these several objects be best attained?

Before explaining the measures that were adopted, and the series of works designed to secure these objects, it will be necessary to describe the general features of the country.

CHAPTER II.

General features of the country affected by the scheme.

Mahanuddy. | Salundee.
Brahminee. | Borabullong.
Byturnee. | Subunreeka.
Cossye.

Between the Chilka Lake and Calcutta the country is traversed by the seven rivers marginally named, each of which, with the exception of the Borabullong, is more or less deltaic in character.

The deltas of the four first named rivers may be said to practically form one great delta, for during extraordinary floods there is almost a continuous sheet of water spread over the whole space from the Lake to the Salundee.

The delta of the Subunreeka stretches on the right bank nearly to the Borabullong, as its waters in extraordinary floods have been known to flow nearly as far as that river. On the left bank it merges into the district of Hidgellee, whose formation is probably owing to the overflow of the Hooghly and its tributaries. The seventh river, the Cossye, commences to be deltaic immediately after passing the town of Midnapoor, but being a comparatively small river, the strip of delta or alluvium formed by its overflow is narrow until the Cossye approaches the estuary of the Hooghly, where it assumes the name of the Huldee.

Immediately above the point where these several rivers commence to overflow their banks, the country begins to slope up steeply to the hills. From that point, however, towards the sea the fall is very gentle, varying from 1½ feet per mile in the Mahanuddy to 1 foot in the Subunreeka and Cossye. Thus the limits within which the works should be confined are clearly marked out. The whole country may be said to be perfectly flat, broken only by such small depressions as carry off the drainage waters to the sea, with the exception of the slightly undulating tract between the Salundee and Borabullong; but even in that portion there is no difficulty in finding a contour line along which a canal

* Previous to the year 1862 there had been a considerable trade in salt from Balasore, but the abolition of the salt manufacture, of course, put an end to this source of trade.

might be carried. The soil, as might be supposed, varies a good deal throughout these districts, and partakes of the character of the rocks which compose the basins of the respective rivers, being of a much richer character in some parts than in others; for instance, though the Mahanuddy and Brahminee are contiguous, the fertility of the delta formed by the latter river is far greater than the delta of the Mahanuddy, as evidenced in the enormous growth of the trees and in the weight of the various crops raised. The deposit of the Subunreeka, on the other hand, is apparently not nearly so rich as that of the Cossye.

Areas of catchment basin and discharge of rivers.

All these rivers are fed by the rains of the south-west monsoon. The size of their respective basins and their maximum and minimum discharges are as follows:—

	Catchment Basin in square miles.	Maximum Discharge in flood.	Average Cold Weather Volume.	Minimum Discharge in May & June.
		Cubic feet per second.	Cubic feet per second.	
Mahanuddy	45,000	1,800,000	3,000	750
Brahminee	9,000	500,000	1,000	380
Byturnee	3,100	200,000	500	180
Salundee	250	60,000	260	...
Subunreeka	6,000	300,000	600	380
Cossye	2,600	143,500	300	180

Crops cultivated in Orissa.

The staple crop of the whole country is rice, and is grown during the monsoon months. It consists of three kinds,—*first*, that which is sown broadcast, and which in Orissa occupies the greater portion of the land, and is locally termed Beallee; ***secondly***, that which is transplanted, and which, in the absence of the means of artificial irrigation, can only be grown in low grounds, where rain-water is likely to lodge: this crop is known by the name of Sarud, and yields both a finer description and a larger weight of rice; *thirdly*, that which is grown at the close of the cold weather, or in the spring of the year, and is known as Dalwa. The crop is wholly dependent on artificial irrigation, and when carefully cultivated yields a good return.

Besides the rice crops there are small quantities of sugarcane, cotton, tobacco, plantain, chillies, pawn leaf, and other garden produce; but the proportion of such crops in Orissa is insignificant. Wheat is also grown in certain localities, but to no great extent. Cotton, mustard and other oil-seeds form the principal cold weather crops. In Midnapoor there is more sugarcane, and there are also extensive mulberry plantations, but the main crop there also is rice, while in Hidgellee rice alone is attempted to be cultivated.

The monsoon the principal season for cultivation.

The principal season of cultivation, therefore, is during the south-west monsoon; and whenever the rains were either deficient or untimely, or if they commenced too late or stopped too early, the great food crop of the whole province was endangered, and could not be replaced in any appreciable degree by any subsequent crop grown in the spring. When the rains cease too early, as for instance in 1865, over any large extent of country, the consequence must inevitably be famine, and from the fact that during the late famine money was utterly useless and powerless to procure food, added to the fact that there has never been any export trade from the Orissa districts, with the exception of the small quantities which are shipped at Balasore, the inevitable inference is that the yield off the land is not more than sufficient to sustain the population from year to year, and therefore that a partial failure of the harvest must produce a certain degree of pressure locally wherever it occurs. Hence the necessity not only of endeavouring to increase the quantity of food grown off a given area of land,

but of so connecting the various districts of the province by lines of cheap water-carriage, that grain may be at once conveyed from the locality where it is to be had in abundance to the place which is in want of it.

The Godavery and Kistna districts used to suffer in precisely the same manner; but since the network of navigable canals has been made, there is scarcely any portion of those districts which is not accessible, and which cannot at once be immediately supplied with food, when, from any unforeseen visitation, the crops in that portion may have either failed or been destroyed.

Rainfall.

The rainfall in Orissa not only varies considerably as to the total quantity, but it is very irregular; heavy bursts taking place during, perhaps, a week without any intermission, being succeeded by nearly a month's drought, in which not an inch of rain falls. The average annual fall is considerably in excess of that in the deltas of the Godavery and Kistna, but the irregularity is very similar. This irregularity is fatal to the proper growth of rice crops, and, I have no doubt whatever, is one main cause of the smallness of the yield in Orissa as compared with that grown in irrigated districts. The rainfall in the Godavery averages, I think, 45 inches. In Orissa it reaches 60 inches. In 1865, the year of failure, nearly 60 inches were registered at Cuttack, but as the rain ceased on the 14th September, the crops consequently perished. The actual quantity of rain falling during the year is therefore no criterion of whether artificial irrigation is necessary or not. It is the irregularity or otherwise of its distribution during the cultivating season which has to be observed.

Main object of the scheme.

These considerations determined the *scope* and the *purpose* with which the works were to be primarily designed, as far as their irrigating properties were concerned. The *main object* to be kept in view was to *secure the principal crop* of the district from all risk of failure from drought.

As mentioned above, all the rivers which had to be dealt with take their rise in the chain of the Eastern Ghauts, which intercept the south-west monsoon in its passage across the peninsula, and are consequently abundantly supplied between the months of June and December, or during the season when the main food crop of the country is on the ground. As far, then, as sources of supply, they are individually superabundant for all the land that could possibly be cultivated. The problem then was,—How could that supply be best distributed? For the elucidation of this point, the character of each of the rivers had to be considered separately.

CHAPTER III.

Character of the several rivers. Mahanuddy.

Of all those named, the Mahanuddy ranks the first in size and importance. Its catchment basin above the gorge through which it passes into the delta measures about 45,000 square miles. From its peculiar configuration, the waters which drain off after a heavy burst of rain arrive more or less simultaneously at the main river, and are the cause of the violent floods and of the immense volume of water which is carried in an extreme fresh, and which has been calculated at as much as 1,800,000 cubic feet per second. The discharge during an extraordinary flood in rivers of such magnitude can, however, only be arrived at approximately. If the data on which the above calculation is founded be correct, the great flood in August 1866 was equivalent to nine-tenths of an inch per day over the whole basin for ten consecutive days, and in the following September of 1 inch per day for four and a half days.

The flood rarely maintains its *extreme* height for 12 hours; but in the case just mentioned, from the day on which the river commenced to rise to the day on which it subsided again to the same height at which it had before stood, the

river had risen through and fallen through 13 feet, during which time it was calculated that the volume of water discharged must have been due to the rainfall above mentioned.

In dealing with the Mahanuddy, a difficulty presented itself at the outset. Immediately upon issuing from the gorge the river bifurcates, one arm retaining the name of Mahanuddy, and the other taking that of Katjooree. From a series of careful investigations which had been made some years previously by Captain J. C. Harris, of the Engineers, it seemed almost certain that the relative sizes of these two rivers had become greatly altered; that the head of the Mahanuddy had become silted, while that of the Katjooree had both so deepened and widened as to take off all the cold weather volume of the river. Captain Harris' investigations further showed that the capacities of all the rivers, so far as the sections within their natural banks were concerned, only admitted of their carrying one-half the volume entering their respective heads, and that, therefore, on the occurrence of every flood above a certain height on the gauges at Cuttack, the country must be, more or less, exposed to the effects of inundation. To meet this difficulty, certain measures had been proposed, one of which was to construct at a particular spot a partial stone dam on the Mahanuddy, which should retard and raise the water in flood, until it had acquired sufficient head to pour down a cutting which it was proposed should at the same time be made from its right bank across the country into a stream which runs into the Chilka Lake. The action of the water on this cutting would, it was proposed, wear it away gradually, until the section was sufficiently large to carry off all the excess water of the Mahanuddy. In other words, the cutting was to serve the purpose of an escape channel for the floods. This project was not approved by the Government; but a proposal made at the same time for diverting the water from the Katjooree into the Mahanuddy by means of a long stone groyne was sanctioned.

This work was a step in the right direction, inasmuch as it commenced to deal with the difficulty at the right point, but it could not of itself, especially as planned, wholly rectify the existing evils. It was plain, however, that the regulation of the rivers must be taken in hand at the outset, and, therefore, the weir at Naraje (the village situated at the gorge) was planned. For economy's sake it appeared best to make use of the groyne which had been already built, though it was not the best alignment for a weir. To make the work answer the object for which it had been constructed, it was necessary to convert it into a complete weir of such a length and height as should reduce the discharge of the Katjooree to the proportion which it had been calculated the two rivers ought relatively to discharge. The existing discharges were as 3 : 4, whereas they should be only as 3 : 5. This necessitated reducing the length of the weir to 3,600 feet; but as to raise it to the full height at once was inexpedient, and might, perhaps, endanger its stability at first, the crest of the weir has been kept 3 feet below its ultimate projected height. To make the division between the rivers complete, it was necessary to run an embankment from the head of the delta across the high sands and intervening islands, which were submerged during extraordinary floods, in order to connect the north wing-wall of the weir with the protective embankment which surrounds the city; otherwise the waters of the two rivers would mingle and flow from one into the other, and so disturb the equilibrium it was sought to maintain. This work is termed in the estimates the "Dividing Embankment." After the weir had been exposed to one year's freshes, it was noticed that there was still a great escape from the Katjooree to the Mahanuddy through the gaps which had not yet been closed, and therefore it is considered advisable that these gaps should be kept open until the silting up effected by the weir has so reduced the quantity of water passing down the Katjooree that at a given height of the freshes, it will no longer flow back into the Mahanuddy. As soon as this takes place, it will be evident that the desired equilibrium has been attained, that the gaps should be

Katjooree.

closed, and the waters of the two rivers thenceforth be kept separate. The result of the weir has exceeded my anticipations. When I inspected it in May last, I found the bed of the Katjooree on the up-stream side had become silted up far more than I thought possible in so short a time, and also that the diminished volume passing over the weir had lessened the velocity of the river below the weir, so that the lower bed was also filling up. The volume of water passing down the Katjooree, and thence down the Pooree rivers, must, in consequence, already be considerably lessened.

To protect the Pooree district entirely, however, it will be necessary to adopt the measures originally proposed by me, *viz.*, regulating the head of each of the rivers below and forming escapes, or rather taking advantage of the present drainage channels and converting them into escapes for the purpose of carrying off the excess flood-waters. Probably escapes of much smaller section than those I originally contemplated will be necessary, as further investigations have shown that, by regulating the slope of the flood surface, and by giving the existing embankments additional height, the sectional areas of the rivers will be so much increased, that they will be able to convey a much larger volume of water than was once supposed. Of these rivers there are four traversing the Pooree district, which must be briefly noticed. Opposite to Cuttack the Katjooree divides into two branches, one of which is called the Khoakye. This last, after a distance of ten miles, throws off from its left bank a branch called the Koosbuddra, which runs through the centre of the tract contained between the Katjooree and the Khoakye. At seven miles further, the Khoakye splits into two branches, called the Bargovee and Dyah. The former runs to near Pooree, and, turning off at right angles to its course, finally disembogues into the Chilka Lake, into which the Dyah also discharges its waters. Both these rivers gradually diminish in section so much that the water entering the head cannot be discharged at the end, and therefore invariably breaches the embankments somewhere and finds a vent across the country. On either side the Koosbuddra, which has the character of a deltaic river through the greater part of its course, are two drainage channels, one called the "Prachee," the other the "Dunnoah." Both of these may be made use of as embanked escapes. They actually serve that purpose now, being the natural drainages of the tract in question, so that wherever the floods breach the embankment, the water finds its way to these hollows, and is by their means conveyed to the sea.

Rivers in the Pooree district.

Between the Dyah and Bargovee a similar drainage, called the "Noon," exists, and by taking advantage of this, it is probable the freshes entering the head of the Khoakye may be safely disposed of. As the Bargovee and Dyah both run on the ridge, and are, comparatively speaking, of regular section, and by no means tortuous, they can probably be made to serve for the main canals of the district. These particulars, however, will be better entered into when the project of the canals for the Pooree district is submitted.

CHAPTER IV.

Returning to the Mahanuddy, that river will be found to divide into several branches before it finally reaches the sea. The first branch is thrown off just opposite to Cuttack, and is called the Beropa. This has a steeper fall than the parent river, and, after a distance of 35 miles, joins the main stream of the next river, the Brahminee, whose estuary is that fine broad and deep tidal river known as the Dhamrah.

The bifurcation of the Mahanuddy and Katjooree opposite to Cuttack determined the site for the main anicuts across those rivers; for had these works been built higher up, the tract of country contained between the branches below the bifurcation could only be supplied with water by means of very expensive aqueducts across

Site for the head works.

those branches. The site for the head works and the point from whence the canal must be taken off being then determined, the designs of those works had next to be sealed, and these depended principally on the nature of the available material.

Fortunately there was abundance of stone and lime procurable. In the immediate neighbourhood of Cuttack there are vast platforms of laterite, and at Naraje and intermediately there is an excellent description of sandstone.

Form of weir.

As it was ascertained that stone could be deposited at a moderate cost, the form of weir across the river Kistna was adopted in preference to that on the Godavery, as requiring less skilled labor, and admitting consequently of more rapid construction.

The head works were then planned to consist of three weirs across the rivers Mahanuddy, Katjooree, and Beropa; but for the Khoakye a set of regulating sluices was proposed. These weirs were 6,400, 3,900, and 1,980 feet respectively. The height of the Mahanuddy and Katjooree weirs was 12½ feet, and of the Beropa 9 feet, exclusive of shutters 3 feet high, which were intended to be added hereafter, whenever the development of irrigation required a greater depth of water to be sent down the canals.

The weir across the Beropa was placed 1½ miles below the point of bifurcation, in order to save that amount of excavation in the high level and Kendrapara canals.

The bed of the Mahanuddy and Katjooree consists of pure sand, except for a short distance near either bank, where a stiff clay is found, and which is supposed to underlie the whole space covered by the city of Cuttack.

In the Beropa the bed for a short distance on the left bank consists of laterite not very compact; the rest is pure sand.

Mahanuddy anicut.

The Mahanuddy anicut was planned to be furnished with three sets of under-sluices, but only two have as yet been constructed. Those on the left bank have been purposely deferred, in order to see what the action on the head of the Beropa would be by allowing the principal draught to be carried down it. The arrangement has thus far proved successful in keeping the head of that river clear.

The under-sluices were originally designed on the same principles as those in the southern deltas; but their action has been found so feeble that I determined to experiment with the design of double moveable shutters, which have been successfully used on rivers in France. This year will be the first in which the experiment will have been fairly tried, and if successful, their adoption in similar situations will be very desirable, as, by reason of the powerful scour created by them, the accumulations in the bed above the anicuts will be greatly reduced.

The head of the canal which is to supply the tract of country lying between the Mahanuddy and Katjooree, and to which the distinctive term "central delta" has been given, is taken off from the right flank of the Mahanuddy anicut, and a set of regulating sluices is built across the head. The lock, with a separate channel, is constructed at about 400 yards above the sluices.

Junction canal.

From this canal a branch, called the junction canal, is intended to be taken close to the principal part of the city, and to be connected with the Katjooree, so as to admit of boats passing from one river to the other, and of carrying their cargoes as near to the merchants' godowns as possible. This canal will be furnished with only a lock on the Katjooree, as head sluices will not be needed.

In the Pooree district it is proposed to use the river Khoakye as the supply channel.

From the Beropa anicut two canals are led off, one on either bank. That on the left bank is the high level canal, intended to connect Cuttack with

Calcutta; while that on the right bank is intended for the irrigation of the tract lying between the Mahanuddy, Beropa, and Brahminee. Each of these canals is furnished with regulating sluices and locks.

City protective works.

As the level of the ground on which Cuttack is built is below that of the river when in extreme flood, it is necessary to surround the city with embankments. These have been constructed many years, the Mahrattas having in the first instance built a massive revetment of laterite all round the head of the delta. When the anicut came to be built, it was considered necessary that the embankments should be raised and strengthened, and put, as far as human effort could do so, beyond the reach of injury by flood. These embankments are distinguished in the estimate by the name of "City Protective Works."

The structures above enumerated include what are termed the head works on the Mahanuddy at Cuttack. A more minute description of their design, dimensions, and other particulars will be given hereafter.

CHAPTER V.

Description of the canals.

The canals have now to be considered. Those intended for the Pooree district not having as yet been entered upon will not now be enumerated. Five canals have been designed for the Cuttack district, of which two are branches only from the following three main heads, *viz.*,—

1. The high level canal.
2. Kendraparah ,,
3. Taldundah ,,

The two last throw off each a main branch to serve for navigation as well as irrigation. That from the Kendraparah canal is called the Pattamoondee branch, and that from the Taldundah canal is called the Machgong branch; both are intended to terminate in tide water.

Kendraparah canal.

The Kendraparah canal, which it will be convenient to consider, first takes off from the right flank of the anicut across the Beropa. It is intended to convey water sufficient to irrigate the tract of country contained between the Mahanuddy, Beropa, and Brahminee, and to which the name of the northern delta has been given. This tract measures about 700 square miles, and contains about 406,000 culturable acres. As almost the whole area is cultivated with rice crops, it was considered desirable to provide sufficient for the *simultaneous* irrigation of at least two-thirds of it, or for 270,000 acres, at the rate of 1 cubic yard per hour per acre. The dimensions of this canal were regulated accordingly, being planned with a width of 160 feet on the water line, a depth of 7 feet, and side slopes of 2 : 1.

That width, however, was only to be maintained as far as the head of the Pattamoondee branch, after which it is reduced to 100 feet, the slope of the bed remaining the same, *viz.*, 6 inches per mile. The width again diminishes in proportion to the quantity of water drawn off by each distributary, until the minimum width of 75 feet is attained. The depth continues the same throughout in full supply, but the fall is reduced first to 4 inches per mile, then to 1½ inches, and finally to a dead level in the last reach which ends at a village called Marsaghai, and from whence there is tidal navigation to the anchorage at False Point.

The floor of the head sluices being 59·50 feet above mean sea level, that amount of fall has to be overcome in the length of 40 miles. This is affected by seven locks, inclusive of the tidal lock, so arranged as to maintain a depth of 4 feet throughout, should the supply of water ever run so short as to necessitate the canal being reduced to a still-water navigation.

The general direction of this canal being parallel, and for the most part close to the river bank, its embankments serve the double purpose of tow-paths to the canal and flood banks for the protection of the country; consequently by this one work this tract is both preserved from inundation and supplied with water for irrigation, as well as furnished with the means of conveyance for its produce to the port.

Irrigable area.

The actual area allotted for irrigation, after deducting that assigned to the Pattamoondee branch, is 157,000 acres, of which at present only so much is provided for as lies on the left bank of the Chittertollah and Noona (both minor branches of the parent river—Mahanuddy). The insular portions contained between the right bank of those branches and the left bank of the Mahanuddy Proper, about 50,000 acres, will have to be supplied by means of an acqueduct taken off the main line near the head of the Noona.

Distribution channels.

For distributing the water to the villages, 13 principal channels with 37 minor branches, are taken off the main canal, and measure in all 171 miles. These distributaries vary in section according to the areas which they have respectively to irrigate. Their direction is shown on the inch-to-the-mile map.

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Weir.

From the terminus of this canal, there are two routes to the anchorage in False Point Harbour, one down the rivers Noona and Mahanuddy and *viâ* the Bakood creek, the other by the tidal creek called the Jumboo. This latter route being somewhat shorter, and having a greater depth of water over the bar at its mouth will no doubt prove ultimately the route which all cargo boats will take, especially during the months when the river is in flood; for at such times the flood tide has no effect on the current of the river, which is so strong that even empty boats find great difficulty in stemming it, whereas along the bank of the Jumboo a towing path can be easily made, and the upward passage of boats be greatly facilitated.

Pattamoondee branch.

The Pattamoondee branch above mentioned will take off from about the 4th mile from the head of the main canal, and run parallel and close to the right bank first of the Beropa, and then of the Brahminee, into whose estuary it will drop at the village of Pattamoondee. This place is frequented by grain merchants, and is the focus of the little export trade which takes place by the Dhamra. The river here is so large and with such deep water that in all probability it will become a considerable place of export eventually, for when they are once over the bar, on which there is 16 feet of water at spring tides, ships could ride more safely than in the Hooghly. Whether it may eventually prove advisable to improve the entrance to the Dhamra will depend of course on the trade which may spring up, but for the present a steam tug only is wanted to enable vessels to enter and depart safely. This branch has to irrigate 113,000 acres.

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Taldundah canal.

The second canal to be described is that to which the name of Taldundah has been given, as that village is the present limit to the tidal navigation, and is the point to which the steamer *Teesta* brings all goods and passengers from the anchorage. The canal, however, has been projected to extend to 8 miles further down, and to drop into a sheltered tidal creek, for at Taldundah the terminal lock would have to be built on the bank of the main river, and there would be no certainty of deep water being permanently maintained near it. This canal is precisely of the same type as that just described, with the exception that, as it has not to convey so much water, its dimensions are not so large.

The canal head is taken off from the right flank of the Mahanuddy anicut, and runs for 7 miles, with a fall of 6 inches per mile, a surface width of 96 feet,

with side slopes of 2 to 1, and a maximum depth of 8 feet, capable of discharging, if required, 1,460 cubic feet per second.

Machgong branch.

At that distance two locks occur, one to regulate the entrance into the branch canal to Machgong, which is here thrown off; the other to the continuation of the main line, which runs more or less parallel with the bank of the river to Taldundah. There are 8 locks in its whole length, and the same fall of 59·50 feet to be overcome.

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The tract which is commanded by this canal and its branch to Machgong, has been designated the central delta, and contains 400 square miles, equal to 232,000 culturable acres, for two-thirds of which, or 155,000 acres, water is provided at the same quantity per acre as on the Kendraparah canal; for throughout it also rice is the principal crop cultivated. This line will be equally important with the Kendraparah canal as far as navigation is concerned, as all the produce of this delta, and probably all that is brought from the Pooree and southern districts, will find its way along it to the port. It is very important also to have two lines of communication to the port, as thereby it will be always possible to close one for repairs without much inconvenience to the public; and in the case of any unforeseen accidents to one, the other will be always available. When once an important trade has been established, it is most essential to avoid all risk of the line of communication being wholly interrupted.

The Machgong branch was planned more especially with a view to affording irrigation. It will, during the cultivating season, serve the purposes of navigation; but as there is no important place at its terminus, and the estuary of the river Daib into which it falls is visited by only a few country vessels occasionally, a line of canal navigable throughout the year is not of so much importance, and therefore no locks have been designed for it for the present.

The dimensions given to this canal are 60 feet on the water line, with a depth of 5 feet in full supply, and a fall of $1\frac{1}{2}$ feet per mile. It has to supply with irrigation an area of 82,000 acres. As both these canals run more or less near the river's margin, their embankments will likewise help in affording protection to the country from inundation.

The distributaries from both these canals are to be arranged similarly to those from the Kendraparah canal, and the natural drainage of the country wherever defective will be improved. As on the Kendraparah canal, so here the amount of drainage *intercepted* is very small, and will be provided for by 10 syphon culverts in each canal.

High level canal.

It now remains to describe the high level canal. This work differs essentially in design from those just described. Its importance as a continuous line of first class navigation connecting Cuttack and all parts of Orissa with Calcutta is equal, if not greater, than the irrigation which it will simultaneously afford. Its power as an irrigating canal is confined to a small area in comparison with its length, as it is necessary for so important a line of navigation, where there will be so much traffic proceeding both ways, that the velocity should be kept as low as possible, consistent with other conditions. With a low velocity, of course, the discharge must be proportionately small, unless the canal be made of great width.

Dimensions.

The dimensions given in the present instance are 120 feet on the water line, with a maximum depth of 8 feet, side slopes of 3 to 1, and a fall of only one inch per mile. The mean velocity with these dimensions amounts to only $\frac{9}{10}$ of a foot per second, and the surface velocity to about 1,100 yards, or $\frac{3}{5}$ of a mile per hour. * * * * * On this long line of navigation, where the obstruction from lockage will be trifling, I have little doubt but that it will be found profitable to run passenger steamers as well as to use steam power for towing. The capacity of this canal in

full supply will be 705 cubic feet per second, sufficient at the same rate of calculation in round numbers for 90,000 acres.

As the direction of this canal lies *across* the drainage of the country, its construction might at first sight appear to be accompanied with considerable difficulties, especially as some formidable rivers have to be passed before Calcutta is reached; but the very fact of the principal part of that drainage being concentrated in those rivers facilitates the construction of the canal, and affords the means of its proving more remunerative than it would otherwise be; for, as each of these rivers affords a *fresh source* of supply, the canal is divided into as many sections as there are rivers to be crossed, and thus, instead of its being only able to convey 700 cubic feet per second along its *whole* length, it can be made to convey an equal volume along *each section* of its length, and so its irrigating capacity is, of course, increased in proportion to the number of its sources of supply.

Before considering each section in detail, it will be well to give a short general description of the course it takes. Starting from the left bank of the Beropa, it follows the high ground which skirts the edge of the delta, until it reaches the river Brahminee, the bed of which is there 8 feet lower than that of the Mahanuddy. The Brahminee, which here bifurcates, is spanned by two anicuts, one across each branch at the apex of its delta. The canal starts again from the left bank, receiving its supply from the Brahminee, and similarly skirts the edge of the delta land as far as the river Byturnee, which in its turn is spanned by two anicuts at the point of its bifurcation. The canal is then continued from the left bank, receiving its supply from the Byturnee, and runs more or less parallel with the trunk road to the river Salundee, which likewise will be most conveniently crossed by an anicut. From this river the canal will follow a contour line, crossing and re-crossing the trunk road until it reaches the town of Balasore, below which it will be dropped by locks into the Balasore river.

General description.

For its continuation from thence a new summit level and source of supply is found in the river Subunreeka, across which another anicut has to be built, from either flank of which the canals to Balasore and Midnapoor are respectively led off. The levels do not admit of the canal from the Subunreeka being taken to Midnapoor itself, so it joins that portion of the canal which takes its supply from the Cossye at about 10 miles below that town.

The canal from Midnapoor is fed by the Cossye, across which an anicut is thrown, and runs straight to the Hooghly at Ooloobaria. The Cossye has to be re-crossed at Panchkoorah, where a second dam is built, which supplies the next reach as far as the Roopnarain, from whence the two remaining reaches are tidal. The total length from Cuttack is about 250 miles.

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The irrigable area commanded by this section of the canal amounts to 89,000 acres, included in an area of about 150 square miles. The water will be distributed by 17 channels of varying capacity, and an aggregate length of 113 miles, the width of water surface in which will vary from 10 to 26 feet, the depth from 2 to 4 feet, and the fall from ·5 to 1·5 feet per mile.* * * *

The Brahminee is a large river draining a catchment basin of about 9,000 square miles. Its flood discharge amounts to 500,000 cubic feet per second, and its volume does not diminish below 1,000 cubic feet until the month of May, when it is reduced to 380 cubic feet per second, but it is frequently augmented by the heavy north-west storms which occur in the hills at that period of the year. Just above its bifurcation, the Brahminee is nearly a mile wide. Of the two branches into which it divides, the larger measuring 4,000 feet retains the name of the main river, while the smaller branch, which is only 900 feet broad, is called at the head the Pattia, and a few miles lower down is better known as the Kursooa. An anicut, 8 feet high, is designed to span this river into two

The Brahminee.

branches, and the water held up by it feeds the 2nd section of the high level canal, as also the tract of land enclosed between the two rivers from the bifurcation to their junction again after a length of 50 miles.

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From the left bank of the Pattia, the 2nd section of the high level canal is taken off with the same capacity as the 1st section, and runs for about 13 miles as far as the river Byturnee. The triangle of land enclosed between the Kursooa and the Byturnee, and irrigable directly by this section of the canal, contains about 50 square miles, or about 30,000 cultivated acres; but as the area between the two branches of the Byturnee, measuring 250 square miles, or 145,000 acres, of which two-thirds, or nearly 100,000 acres, may eventually require irrigation, is larger than the available water in that river during the cold weather can supply, this section of the canal will have to convey a portion of the water from the Brahminee to supply the deficiency, and therefore it has been designed with dimensions equal to those of the 1st section.

2nd section.

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The irrigation from this section of the canal will be very simple, as the area to be supplied is comparatively small. The irrigation of the tract enclosed between the two rivers above alluded to will have to be taken direct from the river through separate head sluices on the left flank of the anicut across the main branch. Detailed estimates have been made for the distributaries.

The river Byturnee, which furnishes the supply to the 3rd section of the high level canal, is subjected to the most violent floods. The catchment basin measuring 3,100 square miles, appears to be exposed to very heavy storms of rain, and its valley above the village of Amboh, which is situated in a gorge, has been described to be at times completely submerged with water. It is certain that the whole of the drainage of its basin does not find its way by the bed of the Byturnee, but that headed back by the contraction at the gorge at Amboh, a large volume of the flood escapes over a saddle to the north of that village, and spreading over the country crosses the trunk road near the village of Barriepoor by the Roboo nullah, a large drainage stream which ultimately finds its way into the Byturnee again near its confluence with the estuary of the Brahminee.

The Byturnee.

The floods which proceed down the river itself and which are calculated to amount to 200,000 cubic feet per second overtop the banks at about 10 to 12 miles above the trunk road crossing, and occasion much mischief on the left bank especially. Embankments must therefore be constructed to prevent this overflow down to the point where the river bifurcates below the village of Aquapudda, and where weirs have to be built across the two branches. These weirs I should now propose to build of masonry for only 5 feet of the full height, and to obtain the rest by means of shutters, either self-acting or after the model of those lately made at Cuttack, as by so doing both less building material will be required, and less obstruction offered to the passage of the floods.* * * * * * *

The 3rd section of the canal will thus be taken off from the left bank of the Byturnee, and also run more or less parallel with the trunk road as far as the next river, the "Salundee," across which, being provided with a similar set of sluices and lock, it will be carried by a weir near the town of Bhuddruck.

3rd section.

Drainage has to be provided for in this length of canal for an area of about 190 square miles, in addition to the overflow from the Byturnee at Amboh above mentioned. For this purpose, the waterway provided in the Aqueducts amounts to 7,000 square feet.

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The area contained between the Byturnee and Salundee capable of irrigation is considerable, measuring 250 square miles, or about 145,000 acres of

cultivated land. Most of this will have to be supplied during the season of rice cultivation by a separate channel led off from the point of bifurcation and independent of the high level canal. The average discharge during the monsoon is superabundant during the cold weather; the volume does not fall below 500 cubic feet per second; but in the dry months this is reduced to about 180 cubic feet, and it is often replenished by the heavy storms which prevail in the surrounding hills. The lines for the distribution channels have not been surveyed in detail as yet. It is also at present much exposed to inundation for want of a proper system of embankments, though the existing lines have, within the last two years, been improved.

The Salundee. The Salundee, from which the 4th section of this canal is taken off, is a much smaller river than any of the others previously described, having a catchment basin of only 250 square miles. During the monsoon, *i. e.*, from June till the end of October, it is supplied with more water than the high level canal could ever take off. After that month, however, the supply begins to diminish rapidly, and in the dry months the canal must be fed from the Byturnee and Brahminee combined.

From the Salundee two lines of canal have been projected—one to maintain a high level, running on the same rate of inclination and following the configuration of the ground as far as the town of Balasore, where it will be dropped by a flight of locks into the tidal river below the town; the other to be taken direct towards the coast, till it reaches the tidal river "Metaie," into which it will be dropped by a flight of locks at the village of Rokanaidpoor, from whence it is to be carried parallel to the coast as a tidal canal and be locked up to high spring-tide level.

4th section. **The upper line which forms the 4th section will have to be carried by an aqueduct over the river Kansbans, which is met with about half way between the Salundee and Balasore. Its catchment basin measures about 220 square miles, and its waters** are carried under the trunk road by two large bridges, the waterway in which is a gauge of its floods. For the monsoon crop a full supply will be obtainable from the Salundee, but there is not sufficient water to irrigate any cold weather crop. The length of this section is about 58 miles, and the area commanded by this section is about 460 square miles, equal to 230,000 acres, for two-thirds of which irrigation may be provided, or for say 153,000 acres.

The line of this canal has all been surveyed and levelled, but the estimates for the masonry works have not been prepared in detail.

The quantity requisite to supply the evaporation over this length of canal during the hot months will be about 40 cubic feet per second, while the lockage at the rate of 100 locks full per 24 hours will require about 40 cubic feet more, so that allowing half as much more for wastage, 100 cubic feet per second will be sufficient for this canal for all purposes of navigation. The Brahminee carries about 400 cubic feet, and the Byturnee somewhat under 200 cubic feet per second, so that there is plenty of water to spare for the maintenance of navigation along the whole distance. Supposing, however, that it were found either requisite or desirable to expend that supply in irrigation instead, then the navigation could be maintained during those months by the lower or coast line.

The double line of canals was projected for two reasons,—*first*, because the coast line running on the lowest level, and requiring no large drainage works, as well from the softer nature of the soil, can be more quickly and economically constructed; and, *secondly*, because on a great line of traffic, such as this is sure to become, it is most desirable that there should be always an alternative line, so as in the event of any accident happening to the one, the traffic may yet proceed without intermission along the other. This arrangement is rendered all the more feasible in this scheme from the presence of so many tidal rivers in Orissa; for when this connecting link to Balasore has been once made, it will be quite possible to close any of the other canals at any time,

and yet keep the through communication uninterrupted. The river "Metaie" is, notwithstanding its name, a tidal river of large dimension, navigable for sea-going craft almost up to Rokanaidpoor. From its junction with the Brahminee, or rather its estuary, the Dhamra, boats can proceed by open tidal nullahs either across to the Mahanuddy, or to the termini of the Pattamoondee and Kendraparah canals, and thus reach Cuttack. In fact, the coast line, if the existing natural channels are connected by artificial cuts such as that proposed, would form as it were a grand junction canal connecting the ends of all the other canals, and consequently enable the communication from Cuttack to Calcutta to be maintained uninterruptedly.

5th section. The Subunreeka. After reaching Balasore, it becomes necessary to look for a new source of supply for the next or 5th section of the high level canal. This is found in the Subunreeka, a river which has a catchment basin of 6,000 square miles, a discharge of about 300,000 cubic feet per second in the flood season, and of not less than 380 cubic feet per second during the dry months. After careful examination and survey of the river, it was decided to fix the site of the weir at a spot where about 2,000 feet of width could be obtained, near the village of Totaparra. At this point the spill itself is reduced to a minimum on both banks; while, on the right bank, a laterite quarry exists. * * * * * The Subunreeka has a fall varying from 1¼ to 1 foot per mile; its bed consists of very fine sand, and the extreme flood rise is about 20 feet. As during the rains it carries a large body of water, and as its dry weather volume is also very considerable, it is particularly fitted to form a source of supply for the two portions of the high level canal to the north and south of it. After both these lines had been carefully surveyed, it was found that the south canal would just skirt the edge of the cultivated land which marks the boundary of the Mohurbunj Tributary Mehal, and fall into the river at Balasore opposite to the terminus of the canal from Cuttack.

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The area of land commanded by the 5th section amounts 180 square miles, or about 90,000 culturable acres. Much of this land has been exposed to almost annual inundations, and consequently a good deal of it lies waste, and the population per square mile must be less than most parts of Orissa. But there is a number of large villages scattered along it, and the land itself yields good crops of rice. In the year 1865, however, there was scarcely a blade of grass to be seen throughout the whole tract.

6th section. From the left bank of the Subunreeka, the 6th section of the canal will have to be taken off in cutting for the first few miles, after which it can follow the requisite level to its junction with the Midnapoor canal near Debra, about 10 miles from Midnapoor. The levels do not admit of its being carried to that town itself. * * *

Branch junction canal. At the 17th mile it is proposed to throw off a branch canal, which shall likewise carry water for irrigation, but which will be especially intended to connect the high level canal with the tidal navigation at the head of the Russoolpoor river.

The total area for which irrigation is provided by this section of the high level canal is 200,000 acres. The main crop here is also rice, and hitherto there has been but very little attempt at cultivating cold weather or spring crops. The country is thickly populated, and there are villages of considerable size scattered throughout it. As labor, however, has not been plentiful hitherto on the road works, it is probable higher rates may have to be given. The estimate of this portion was therefore framed somewhat higher than for the other sections. The total amount estimated by the Irrigation Company's officers was 38 lakhs, but this included 5½ lakhs for establishment, and a nearly equal

sum for the head works. The distributaries and sluices are estimated at Rs. 4,90,000 more, so that the cost of the canal itself, with contingencies, amounts to about Rs. 22,60,000 for 83 miles, or about Rs. 27,000 per mile. The cost of the whole scheme, however, even as estimated by the Irrigation Company would, for 245,000 acres, be at the rate of Rs. 15·5 per acre.

7th section.

The last or 7th section of the high level canal is that between the town of Midnapoor and the Hooghly at Ooloobaria. For the first 25 miles of its length, it is fed from the river Cossye, across which a weir has been thrown, and the canal led off from the right bank along the ridge which lies between the valley of the Cossye and the feeders of the Kalleaghye. As almost the whole difference of level between the bed of the Cossye at Midnapoor and tide water at Ooloobaria has to be overcome in these 25 miles, there are as many as six locks in that distance, the last one of which drops the canal into the branch of the Cossye, which flows past the village of Panchkoorah. This branch is only 330 feet broad, but as the flood level rises 3 feet above the natural banks, it would have been difficult to pass the river by an aqueduct, and therefore it was determined to build a dam composed partly of masonry and partly of self-acting shutters, by means of which not only could water from the canal be passed across the river, but also the small supply which is available during nearly the whole of the dry season be intercepted and diverted down the next portion of the canal which reaches to the Roopnarain. This reach commands about 50,000 acres, and it was here that lands were first irrigated from the canals, and where probably a considerable extension will hereafter take place. A lock on the left bank will admit boats from the river into this reach, and a lock at the end of it passes them out into the Roopnarain. From thence that river takes up the navigation for about 4 miles, when at the village of Kantapokur, the next reach, only about 4 miles in length, connects the Roopnarain with the Damoodah by an open cut, and from the Damoodah the terminal section to Ooloobaria completes the navigation to the Hooghly. In this section locks have been built at either end, which maintain the canal to the level of high water, so that boats can navigate it at any time of tide.

The Cossye.

The river Cossye has a catchment basin of 2,600 square miles; its extreme flood discharge amounts to about 143,500 cubic feet per second, while its minimum discharge has not fallen below 190 cubic feet per second. Consequently, for the main crop, which consists almost entirely of rice, there is a superabundant supply, while the minimum discharge is more than sufficient to meet all the requirements of navigation. The locks are so arranged that there shall be a depth of 5 feet throughout should it ever be necessary to reduce the canal to still water. The dimensions have been fixed at 80 feet width on the water line in cutting, and 120 feet in embankment, with side slopes of 2 to 1, a maximum depth of 8 feet, with a fall of 4 inches per mile, making its discharging capacity equal to 930 cubic feet per second, or sufficient for about 120,000 acres of rice.

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Beyond the Cossye in the reach between it and the Roopnarain, the great portion of the drainage is taken under the canal near the village of Siddha by a large syphon culvert with self-acting shutters capable of discharging 1,200 cubic feet per second, which has to perform the double duty of keeping out the salt water in the dry months and discharging the surplus fresh water in the rains. The rest of the drainage runs parallel to the canal, and is carried by the Dainan khall into the Roopnarain. In the two tidal reaches connecting the Roopnarain with the Hooghly, sluices are provided on the canal banks to admit the local drainage being passed into it, but it will be better eventually to lead it away from the canal to the nearest outfall.

Seventeen distribution channels, with an aggregate length of about 140 miles, have been designed for this canal, twelve of which irrigate the area

between Midnapoor and Panchkoorah, and five the land between the latter place and the Roopnarain. The water of the Cossye is held by the cultivators in much esteem for the fertilizing deposit which it carries in large quantities during the rains.

As a line of navigation from its proximity to Calcutta, and by collecting the traffic of the intervening rivers, it becomes the most important of all the sections. There is little doubt but that the receipts from tolls alone will eventually pay the interest on its cost.

Tidal canal.

This completes the description of the high level canal. There remains yet one more work to be mentioned, and that is the tidal canal, which commences at Banka, about 4 miles above the junction of the Roopnarain with the Hooghly, and extends at present to Kalinuggur on the Russoolpoor. The first section of this canal was originally a small work belonging to the Government, intended principally for the salt trade. It was merely an open cut, 45 feet wide at the surface, and navigable only at high spring tides. By it boats used to pass into the Huldee, and so up the Cossye to Midnapoor, during the rains. When the Company projected the tidal canal, this section of it was made over to them by the Government. Its dimensions have been increased to 90 feet on the water line, and a lock projected for either end for the purpose of maintaining the canal always full, so that boats may navigate at all times of tide. As long as it remained an open cut, it invariably silted up several feet every year at the place where the tides met, and so cost large sums for clearance. One lock only has as yet been constructed, but the action of this has been beneficial, inasmuch as the tide having only one means of exit, a scour has been created at ebb tides, and thereby the deposit of silt has been considerably reduced.

By continuing the canal from the Huldee to the Russoolpoor a safe communication has been opened from Calcutta to the village of Balliaghai, the principal grain mart of the Hidgelle district. As soon as the southerly winds set in at the beginning of March, the navigation of the Hooghly in the reaches below the Roopnarain becomes dangerous for country craft, so that communication with the districts on its borders may be said to be practically cut off for eight months of the year. The construction of this inland canal at once affords a safe passage to boats, besides shortening the distance by one-half of the river route, or from 60 to 30 miles.

It was originally intended to extend this canal to Balasore; but when the Subunreeka works were projected, and it was found that the canal from that river to Balasore must necessarily run not far from the coast, it seemed better to postpone the continuation of the tidal line. I have little doubt, however, that it will eventually be found desirable, in order to complete the system of alternative lines, and to guard against any possible interruption to the traffic, to finish the coast line as originally contemplated.

When the locks, which are 150 feet long by 20 feet wide, are finished on this canal, so that it can be always kept full to high water level, it will afford a first class navigation,, 90 feet wide at the surface, and never less than 8 feet in depth. There is already a considerable traffic to and from Calcutta to the southern districts; and with the increased facilities which this canal will afford, combined with the trade which its eventual connection with the valley of the Subunreeka will induce, there is very prospect of this portion of the project yielding a good return on the outlay. This completes the system of works projected for the Province of Orissa, and they will, when fully carried out, not only protect its main food crop from the risk of perishing from drought, but by furnishing it with cheap means of transit, and by bringing it into communication with other districts, both north and south, and rendering it accessible from the sea-board, give such an impetus to its trade as it has never yet known.

CHAPTER VI.

Navigation of Upper Mahanuddy.

There is, however, one more side from which it is as yet only partially accessible, and that is from the west. Although the river Mahanuddy is navigable for the greater part of the year, yet from a point 100 miles above Cuttack its bed is so encumbered with rocks as to make navigation at certain stages of the river very perilous. This circumstance has, however, served to call forth a class of boatmen, who, perhaps, are unequalled in skill in managing a boat through such surging rapids as have to be encountered. The boats themselves, one would suppose, were most difficult to manage, where the passages are not only narrow but sometimes tortuous, for they are nearly 100 feet in length and about 6 feet broad, with a long entrance and run, and perfectly flat-bottomed and wall-sided. They seldom exceed 3 feet in depth, and when fully laden draw at the outside 2 feet, generally less. When empty their draft is less than 6 inches. There are seldom more than four men on board each boat, two of whom stand at the bow with a strong bamboo up-lifted, ready for the emergency. The other two are at the helm, which consists of a long sweep generally out of the water. With one vigorous stroke of this oar they will nearly turn their long boat at right angles to the current, and with another stroke bring it back again to its original course. Notwithstanding the difficulties to be encountered, there is a very considerable trade down the river from Sumbulpoor and Chutteesghur, of which cotton forms an important item.

Recommended by Chief Commissioner, Central Provinces.

Sir Richard Temple, when Chief Commissioner of the Central Provinces, was urgent for the improvement of this communication, and surveys were made at the outset of the Company's operations to ascertain the feasibility of constructing a canal parallel to the river, so as to avoid entirely the rocky obstacles in the bed. For this canal it would be necessary to build a dam across the Mahanuddy as high up as Puddumpoor, 30 miles above Sumbulpoor, where there is a rocky barrier right across the river. A canal taken from thence would skirt the margin of the river more or less all the way down to Dholepoor, and fall into the Mahanuddy again not far above the mountain gorge through which that river flows, and which is known as the Burmool Pass. All the necessary particulars for framing an estimate for this work were collected by Mr. Walker, the present Superintending Engineer of the Orissa Circle, who is likewise acquainted with nearly the whole basin of the Mahanuddy, having explored every one of its principal tributaries.

Reservoirs on feeders of Mahanuddy.

In connection with this project investigations were made into the possibility of constructing reservoirs on the several feeders of the Mahanuddy, primarily with the view, by a system of storage, to regulate the floods and moderate their violence in the delta. The examination was carried out very minutely, and resulted in establishing the fact that sites more or less favorable existed on all the tributaries—Tel, Ebe, Husdoo, Jonk and Tedi Maun. The sites of the two first were surveyed in detail and estimates framed. The contents of these reservoirs would be 40,000 and 32,000 millions cubic feet respectively, or 72,000 millions combined. If this volume were kept out of the Mahanuddy for 24 hours, it would be equivalent to reducing the discharge of that river by 833,333 cubic feet per second, leaving 966,667 cubic feet, or just about what the rivers are calculated to discharge within their *natural* banks at a distance of 25 miles from the head of the delta. Supposing the reservoirs were constructed, the actual result in practice might possibly not be as above, but the calculation is sufficient to show what an aid such reservoirs would prove in moderating and retarding the floods, to say nothing of the additional supply they would afford to the river in the summer months, thereby improving its navigation over the existing shoals, as well as being available afterwards for distribution through the delta canals.

The reservoir on the Ebe would command a large part of the Sumbulpoor district, which is Government territory, and prove very valuable for irrigation. The reservoir on the Tel would be situated in one of the Gurjat or independent Hill States. It also would command a large area for irrigation; but as the population in that part of the country is sparse and poor, little or no revenue could be expected from the neighbourhood; but the water would be very valuable in the delta, to which of course it would be allowed to flow, and by its volume would increase the depth over the intervening shoals in the river, and so, as above stated, improve its capability for being navigated during the summer months.

It is not to be understood from what has been said above that reservoirs are absolutely indispensable for regulating the floods of the Mahanuddy, which, I believe, can be otherwise effectually dealt with, and which will form the subject of a separate report; but such works have always appeared to me to be a more reasonable way of managing surplus water in a country (where water is more valuable than almost anything else) than the usual method of allowing it to be carried off to the ocean, and so lost for ever. That there are difficulties in the way of constructing works of magnitude in out-of-the-way places must needs be admitted; but it is the business of the Engineer to overcome such difficulties, and the longer we abstain from grappling with those difficulties, the more formidable will they appear.

CHAPTER VII.

Probable cost of the scheme.

The extent and purposes of the several portions of the works comprised in the Orissa Scheme having been described, it remains to state their probable cost, and to consider the sources from which a return for the past and proposed outlay may be derived.

First, the cost. The following is a statement of all the estimates as prepared by the Company's Engineers towards the close of last year and lately submitted in abstract to the Government of India, and as they have now been revised according to the departmental forms. These include all the works which have hitherto received the sanction of the Bengal Government, and on most of which expenditure has been incurred. For all such, detailed estimates with plans accompany this report:—

No. of Estimate.	Name of Work.	Amount of original Estimate.	Amount of revised Estimate.
		Rs.	Rs.
B. G. Estimate No. 75 of 1869-70.	Mahanuddy Head Works, consisting of the Anicut, Head Lock at Jobbra, Head Sluice to Taldundah Canal, Junction Canal, Lock Channel, Revetment Wall and City Protective Works	12,43,800	12,43,800
No. 89 of 1869-70.	Constructing a Weir at Naraje across the Katjooree and an Embankment to connect the Anicut with the City Embankments	4,52,093	4,52,093
No. 78 of 1869-70.	Constructing 1st Section of the High Level Canal from the Beropa to the Brahminee, including Protective Bunds	11,60,353	11,74,852
No. 88 & revised Estimate No. 128 of 1869-70.	Constructing an Anicut across the Beropa, including Head Locks and Head Sluices to the Kendraparah and High Level Canals	3,12,474	3,23,587
No. 129 of 1869-70.	Constructing Distributaries from the 1st Section of the High Level Canal	2,91,242	2,36,205
	Carried over ...	34,59,962	34,30,537

No. of Estimate.	Name of Work.	Amount of original Estimate.	Amount of revised Estimate.
		Rs.	Rs.
	Brought forward ...	34,59,962	34,30,537
No. 79 of 1869-70.	Constructing 2nd Section of the High Level Canal from the Brahminee to the Byturnee, including Embankments on the Byturneee and Gondonoi ...	4,62,563	4,62,421
No. 127 of 1869-70.	Constructing Distributaries from the 2nd Section of the High Level Canal	1,15,389 1,26,591	2,00,000
No. 77 of 1869-70.	Constructing 3rd Section of the High Level Canal from the Byturnee to the Salundee, including River Embankments	7,60,093	7,59,514
No. 127 of 1869-70.	Constructing Distributaries from the above ...	1,00,000	1,00,000
No. 87 of 1869-70 and Supplementary Estimate No. 130 of 1869-70.	Constructing the Kendraparah Canal from Cuttack to tide water at Marsaghai	6,45,820	7,29,406
No. 87 of 1869-70.	Constructing Distributaries therefrom ...	3,00,000	3,00,000
Ditto ...	Constructing Mahanuddy, Noona, and Chettertollah River Embankments and Satbuttea and Noona Groynes	17,561	17,561
Ditto ...	Constructing an Embankment on the right bank of the River Beropa	41,000	45,100
No. 83 of 1869-70.	Constructing Anicuts across the Byturnee and its Branch the Burrha	2,24,064	2,24,219
No. 82 of 1869-70.	Constructing Anicuts across the two branches of the Brahminee	4,94,691	4,92,042
No. 76 of 1869-70.	Constructing the Taldundah Canal, including Locks, Calingulas, Syphons, Escapes, and Bungalows ...	5,85,000	5,85,000
Ditto ...	Constructing Distributaries therefrom ...	1,60,000	1,60,083
No. 80 of 1869-70.	Constructing the Machgong Canal, including Locks, Calingulas, Syphons, Escapes, and Bungalows ...	3,04,000	3,04,484
Ditto ...	Constructing Distributaries therefrom... ...	1,60,000	1,59,516
No. 141 of 1869-70.	Constructing Midnapoor and Oolabariah Section of the High Level Canal, consisting of six Ranges...	19,31,528	20,52,293
No. 142 of 1869-70.	Constructing Distributaries therefrom ...	3,20,000	3,13,300
No. 140 of 1869-70.	Constructing Ranges 1 and 2 of the Tidal Canal from the Huldee to the Russoolpoor ...	6,68,190	7,98,385
No. 81 of 1869-70.	Constructing permanent Workshop Buildings at Cuttack	75,772	75,772
		1,09,52,224	1,12,09,633

Register of Rainfall at Cuttack.

Years.	For the Monsoon Months.								For the whole Year.														Remarks.
	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.	
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.		
1856 ...	·7	·6	·2	·7	3·1	6·0	15·7	12·2	15·6	4·6	3·8	...	63·2	·7	·6	·2	·7	3·1	6·0	15·7	12·2	15·6	4·6	3·8	...	49·5	608·90	Insufficient.
1857 ...	...	...	1·1	4	·5	9·6	4·9	7·0	12·0	9·1	...	...	44·6	...	...	1·1	4	·5	9·6	4·9	7·0	12·0	9·1	...	...	33·5		Ditto.
1858 ...	·2	...	·2	·3	4·2	4·0	12·7	8·1	9·6	...	...	...	39·3	·2	...	·2	·3	4·2	4·0	12·7	8·1	9·6	...	...	...	34·4		Ditto.
1859 ...	...	...	...	3·2	...	9·6	4·9	...	3·2	5·5	...	·9	27·3	...	...	...	3·2	...	9·6	4·9	...	3·2	5·5	...	·9	17·7		Drought.
1860 ...	...	...	...	...	1·0	7·2	7·4	15·1	12·5	·7	...	...	43·9	...	...	...	...	1·0	7·2	7·4	15·1	12·5	·7	...	...	42·2		Deficient in June and July.
1861 ...	3·0	...	3·6	...	4·0	9·0	8·6	23·3	15·6	4·56	2·57	...	74·23	3·0	...	3·6	...	4·0	9·0	8·6	23·3	15·6	4·56	2·57	...	56·5		Ditto ditto, but excessive rain in August.
1862 ...	·8	...	...	...	1·7	10·2	7·9	17·1	12·0	11·0	...	...	60·7	·8	...	...	...	1·7	10·2	7·9	17·1	12·0	11·0	...	...	47·2		Favorable.
1863 ...	...	1·3	·8	1·5	1·6	19·8	20·8	19·6	10·4	2·5	2·5	...	80·8	...	1·3	·8	1·5	1·6	19·8	20·8	19·6	10·4	2·5	2·5	...	70·6		Excessive.
1864 ...	...	1·7	3·0	...	2·0	2·3	10·0	10·8	13·6	5·5	3·9	...	52·8	...	1·7	3·0	...	2·0	2·3	10·0	10·8	13·6	5·5	3·9	...	36·7		Insufficient.
1865 ...	1·10	2·30	3·60	·70	5·26	10·23	12·23	8·08	7·44	1·47	...	·50	52·91	1·10	2·30	3·60	·70	5·26	10·23	12·23	8·08	7·44	1·47	...	·50	37·98		Famine.
1866 ...	·78	1·17	...	4·16	2·30	7·65	8·90	22·00	14·80	11·90	1·85	...	75·51	·78	1·17	...	4·16	2·30	7·65	8·90	22·00	14·80	11·90	1·85	...	53·35		Ditto.
1867 ...	·05	·45	3·15	4·60	5·20	15·30	12·29	16·36	14·46	7·03	·80	...	79·69	·05	·45	3·15	4·60	5·20	15·30	12·29	16·36	14·46	7·03	·80	...	58·41		Favorably distributed.
1868 ...	·25	·25	·30	1·75	7·70	19·60	8·30	7·20	8·15	·90	...	...	54·40	·25	·25	·30	1·75	7·70	19·60	8·30	7·20	8·15	·90	...	...	43·25		Unfavorable and drought in October.
1869 ...	·35	1·42	3·90	1·00	1·45	6·01	14·45	8·28	8·07	8·47	...	...	53·40	·35	1·42	3·90	1·00	1·45	6·01	14·45	8·28	8·07	8·47	...	...	36·81		Ditto in June, August, and September.
Average during 14 Years													57·33													43·50		

But of the works which have been described in this report, the following are not included in that statement. Some of these have been estimated for in detail, others, such as Nos. 4, 5, and 6, only approximately, at the rates at which similar portions of the work have already been constructed, and they are therefore probably not far out :—

		Rs.
1.	Pooree Series originally estimated	6,00,000
2.	Head Works across the Katjooree	5,71,608
3.	Distributaries to 250,000 acres at Rs. 2	5,00,000
4.	Section No. 4 of High Level Canal from the Salundee to Balasore, 58 miles, at Rs. 22,000 per mile ...	12,76,000
5.	Distributaries therefrom to 153,000 at Rs. 2 ...	3,06,000
6.	Alternative line to the coast from the Salundee to the Metaie, 12 miles, with 5 Locks	2,70,000
7.	Coast line from the Metaie to Balasore, 40 miles, and 4 Locks	6,50,000
8.	Sections 5 and 6, comprising the Subunreeka Series ...	34,50,000
	TOTAL ...	76,23,608

The cost of the Subunreeka Series has been set down, according to the detailed estimate framed by the Company's Engineers, less the sum of Rs. 3,50,000 for permanent establishment, as that is an item which is not usually entered in departmental estimates.

	Rupees.
The above sum of Rs. 76,23,608, when added to the estimate for the works already in progress, and which according to the statement amounts to Rs. 1,12,09,633, will make the estimate for the actual works of the whole scheme, exclusive of those projected for the Upper Mahanuddy Series, which are not essentially an integral portion of the Delta Project	1,88,33,241
To that sum, however, will have to be added the following amount :—	
For Establishments, Tools, Plant and Contingencies under the Company's management, as previously shown in the statement submitted to the Government of India	39,50,471
Also the difference between the sums expended in India and that paid by the Secretary of State to the Irrigation Company in England, which, inclusive of the *bonus* of £50,000, appears by the Deed of Transfer to have been Rs. ... ... 1,04,00,500 Deduct expended Rs. 87,63,076	16,37,424
Establishment from January to August 1869	1,55,593
Value of land paid by Government as per Controller's Books to end of August 1869	4,87,249
which will make the aggregate cost	2,50,63,978
There must, however, be further added to that sum the cost of the Establishments required for the supervision of the works remaining to be done. This, if assumed at 20 per cent. on the balance of the estimates above enumerated, will be as marginally shown	26,50,000
Making the aggregate cost, inclusive of interest on Capital to 31st December 1868, say Rs. 277¼ lakhs	2,77,13,978

Viz.,—

	Rs.
Total estimate	1,88,33,241
Expenditure in terms of estimate to August last	55,84,720
Balance ...	1,32,48,521
Twenty per cent. on which will be in round numbers	26,50,000

The balance of Rs. 1,32,48,521 of the aggregate estimate for the actual works will, if the present outlay only, *viz.*, 12 lakhs per annum, be allowed to continue, be spread over a further period of 11 years. Whether it will be desirable to protract the construction of the works over that length of time or not is a question for the Goverment to determine. My own opinion is that it will prove advantageous to the State to have the works completed more rapidly.

CHAPTER VIII.

Sources of income.

The direct sources of income which may be derived by Government from the works comprised in the Orissa Scheme are—

1. Water-rates from irrigation.
2. Tolls from navigation.
3. Increased custom dues.
4. Rents from waste lands, which may be brought into cultivation.
5. Enhanced land revenue from the increased value of the land and produce at the next settlement.
6. Miscellaneous, such as plantations, fisheries, mill rents, &c.

The indirect returns are such as inevitably follow an increased circulation of bullion consequent on extended commercial transactions, and though they cannot be precisely calculated and separated from the general revenues, yet their contribution to the finances of the State is nevertheless very apparent.

From irrigation.

The first and the principal source of income will be that from irrigation. The areas for which water is supplied by the respective canals which have been enumerated are as follows :—

		Acres.
Pooree District		250,000
Taldundah Canal and Branch to Machgong		155,000
Kendraparah Canal and Branches		270,000
High Level Canal, Section I		89,000
„ „ Section II		30,000
Intermediate Tract from ditto		100,000
High Level Canal, Section III		100,000
„ „ Section IV		153,000
„ „ Sections V & VI, Soobunreeka Series ...		290,000
„ „ Section VII, Midnapoor ditto ...		170,000
TOTAL ...		1,607,000

The acreage is calculated at two-thirds of the cultivated or one-half the gross area *commanded* by each series of canals.

The actual proportion of the whole area cultivated with rice crops is much greater ; but to assume the above proportion is to keep well within the mark, and in a rice-growing country within the probable area which will eventually be irrigated regularly.

The price which is now being charged and paid for water is Rs. 2-8 per acre per annum, far below its actual value for even a single crop of rice, considering the enhanced price to which all food grains have advanced during the last eight years.

No account or credit is taken in the above acreage for any land cultivated with dry or spring crops; but seeing that the aggregate cold weather volume in all the rivers amounts to 5,660 cubic feet per second, and allowing only 100 acres per cubic foot, there would be can addition of 500,000 acres to the above-mentioned area. As far as my own experience and observation goes, I doubt if more than one-fourth of the area in an essentially rice-growing country is ever covered with a second crop. I do not mean of rice only, but of any other cereal.

Where, however, *broad cast* rice is largely cultivated, a second crop is always raised off the same ground, and there are of course localities where cotton, maize, oil-seeds, sugarcane, tobacco, chillies, gram, and such like are sown, and on which rice is not cultivated at all. It is quite within the limits of probability that this area will eventually be found equal to one-fourth of the monsoon cultivated area, especially as the value of all such grain has doubled within the last 10 years, and therefore the value of water supplied to that area may be legitimately looked for as an additional source of

revenue eventually; for the present it is proposed to levy only a rate of Rs. 2-8 per acre per annum, independent of what description or what number of crops are raised off the same ground; but in time as irrigation becomes more general, and the cultivators have acquired confidence, discriminating rates for such crops as sugarcane, plantains, and others which require water throughout the 12 months, may, with propriety and justice, be introduced.

Taking, however, only the area first mentioned, *viz.*, 1,600,000 acres, and the rate of Rs. 2-8 at present paid, the eventual revenue to be derived from irrigation may be assumed at 40 lakhs. As the whole scheme was originally based by myself on securing the main rice crop of the province grown during the monsoon, I will take no account of the cold weather cultivation; any revenue which that may yield hereafter will, of course, be so much additional grain.

From navigation.

The next source of revenue is that to be derived from navigation. In the delta schemes of Southern India the revenue from this source was always disregarded, as it was considered that the income realized from irrigation sufficiently re-imbursed the State, and that all the advantage afforded by cheap water transit might be reaped by the people of the district. It was, however, afterwards determined to levy navigation dues. As there are undoubtedly many objections to levying a tax on goods in transit, it was considered preferable to make every boat take out an annual license for permission to ply on the canals.

Such a measure was feasible where, from the waterways being connected with only two rivers, one of which, the Kistna, is navigable to only a very limited extent, no boats other than those which plied on those rivers could enter the canals, but in a scheme like that of Orissa, which when completed will bring the province into communication with the vast system of navigation throughout Bengal, the plan of "licenses" is not adapted, and I question if it would be practicable; moreover, the levying of tolls is well understood throughout Bengal, though it is novel to the immediate neighbourhood of Cuttack, and therefore I am of opinion it will be better to adhere to the existing practice of levying tolls. The extent to which navigation will be developed, though not possible to be foretold with any exactness, can yet be approximately estimated. The very interesting memorandum lately written by Colonel Anderson shows how great a traffic has sprung up on the Godavery and Kistna canals, which at present collect mainly the traffic of their own deltas. There will certainly be a much larger traffic on the canals in the Orissa Scheme, as the rivers from the Mahanuddy northwards are all largely navigated already, and the very fact of the canals being brought into connection with the city of Calcutta and with the river system of Bengal will at once be followed by the traders on those rivers finding their way to Orissa.

From Colonel Anderson's memorandum, it appears that the traffic in the Eastern Delta Canals, measuring 108 miles which lead to the port of Cocanada, amounted for the year 1867 to 10,192 boats laden and empty, and was equivalent to 4,666,833 tons through one mile. The tolls on that traffic would, at the rate of 2 pie per ton per mile now paid along the Orissa canals, amount to Rs. 48,613, or about Rs. 450 per mile per annum. The traffic along the Cocanada canal alone 32 miles in length amounts to 2,669,615 tons through one mile, which at the same rate of toll would give a revenue of Rs. 27,810, equivalent to Rs. 870 per mile per annum. It is estimated that 3,000 passengers also passed on each mile of that canal during the year. These, at the rate of ¼ of a pie per mile, would give Rs. 47 per annum, and make the total earnings of the Cocanada canal for the year Rs. 917 per mile.

From goods.

In estimating the amount of traffic along the Cuttack and Pooree canals, that which takes place in the eastern delta of the Godavery may be taken as a guide, as a similar trade to the port is certain to arise.

The length of the canals in Cuttack and Pooree will be about 200 miles. The tolls on them, therefore, at Rs. 450 per mile, will amount to Rs. 90,000. But for the high level canal, which will intercept the traffic which is now conducted in all the intermediate rivers, as well as that which comes by land from the interior and is conveyed to the Calcutta market, and of which live cattle forms a large item, I think 200,000 tons per annum cannot but be considered as a moderate estimate. For articles which may be carried a long distance, a toll of one pie per ton per mile will probably be found to be the limit chargeable. The revenue therefrom would, therefore, yield at the rate of Rs. 1,040 per mile about Rs. 2,60,000. For the local traffic in the neighbourhood of Calcutta, such as now travels short distances, the higher toll of 2 pies per ton per mile will continue to be paid as at present, and, when those portions of the canals are complete, they will probably yield a revenue of about Rs. 1,00,000.

From passengers.

The passengers travelling by the canals in the Godavery and Kistna delta are stated by Colonel Anderson to have amounted to about 17,555,480 through one mile during the year; the aggregate length of the canals being 491 miles. This gives about 100 passengers per mile per day, or 36,500 per annum, which, at the rate of ¼th of a pie per head per mile, would yield a revenue of Rs. 47 per mile. The traffic on the Orissa canals will probably considerably exceed that rate, both on account of the crowds of pilgrims who flock to Juggernauth, and the proximity to Calcutta, to and from which there is, of course, a constant stream of travellers. It is estimated that 100,000 pilgrims at least traverse the trunk road yearly to Juggernauth. This item alone would give 550 passengers per day coming and going.

I think that 200 travellers per mile per day in addition, or 750 per day, will be within the mark. This number would at the same rate of toll yield a revenue of Rs. 370 per mile, or on 300 miles, the distance from Calcutta to Pooree, Rs. 1,11,000. The probable receipts from passenger tolls over the whole 530 miles may be assumed then at Rs. 1,00,000.

Adding these sums together, the revenue from navigation will probably amount to—

	Rs.
Cuttack and Pooree Canals	90,000
High Level Canal	2,60,000
Midnapoor and Tidal	1,00,000
From passengers over the whole of the canals	1,00,000
TOTAL PER ANNUM ...	5,50,000

From Customs dues.

The third source of revenue, *viz.*, Customs dues, is one regarding which there can be little uncertainty. Up to this time the export and import trade can scarcely be said to have had any existence. No Custom House was established at False Point till 1860-61, and therefore no returns previous to that time are available:—

	1860-61.	1861-62.	1862-63.	1863-64.	1864-65.	1865-66.	1866 67.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Imports	...	...	...	3,30,939	9,318	15,500	18,48,601
Exports ...	67,596	2,46,568	1,78,021	1,80,942	2,56,346	82,253	...

The above is the invoice value of the articles imported and exported. Of the former, the imports in 1863-64 consisted almost entirely of machinery for the Irrigation Company's works, and in 1866-67, of the rice imported during the famine.

The exports consist almost entirely of rice, seeds and hides, but, as will be observed, they are exceedingly trifling, the largest quantity exported, and which took place in 1864-65, not exceeding 3,000 tons. I remember when the value of the annual exports of the Godavery district were under 4 lakhs of Rupees.

I believe they have now reached 70 lakhs. I know of no reason why the trade of Orissa should not similarly increase, and the Customs dues form an important item in its revenue. What the amount may reach it is of course not possible now to determine, but, at a moderate estimate, it may be taken at Rs. 1,00,000.

From waste lands.

The fourth source of income will be rents from waste lands which may be brought under cultivation.

Of such lands there are in the Pergunnahs within the delta—

	Jungle Waste.	Culturable Waste.	Total.
In Pooree ...	33,500	34,039	67,539
„ Cuttack ...	35,300	45,977	81,277
„ Balasore ...	60,800	53,855	114,655
TOTAL ...	129,600	133,871	263,471

Of the above land possibly 200,000 acres may be brought under cultivation, and if only one Rupee per acre be credited, the result due to the works will be an income of Rs. 2,00,000 from this source.

From enhanced land revenue.

The fifth source of revenue is the enhanced land rent that may be levied at the renewal of the settlement consequent on the increased value of the land and equalization of prices throughout the province, owing to the means of cheap transit and system of inter-communications.

The average assessment per acre of the various qualities of land in the three districts now is as follows:—

	Sarud Rice.	Dalwa Rice.	Two Crop land.	Sugarcane.	Culturable Waste.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Pooree ...	1 9 0	0 12 9	1 13 0	4 15 0	0 10 1
Cuttack ...	3 15 2	1 3 1	3 3 4	5 4 2	0 8 0
Balasore ...	1 8 6	2 11 1	2 2 7	6 4 5	0 9 10

The average revenue of the whole of the cultivated lands paid to Government is—

	Cultivated. Acreage.	Rupees.	Per Acre. Rs. A. P.	Culturable. Acreage.	Rupees.	Per Acre. Rs. A. P.
Pooree ...	308,014	4,57,446	1 7 10	34,039	21,274	0 10 1
Cuttack ...	561,833	6,78,862	1 3 4	45,977	22,088	0 8 0
Balasore ...	463,816	2,72,400	0 9 7	53,855	33,678	0 9 10
TOTAL ...	1,336,663	14,08,708		133,871	77,940	

How greatly the prices of all kinds of food grain have increased within the last eight years will be seen from the following table:—

ARTICLE.	POOREE. Average production per acre.	POOREE. Value in 1860.	POOREE. Value in 1867.	CUTTACK. Average production per acre.	CUTTACK. Value in 1865.	CUTTACK. Value in 1867.	BALASORE. Average production per acre.	BALASORE. Value in 1860.	BALASORE. Value in 1867.
	Maunds.	Rs. A. P.	Rs. A. P.	Maunds.	Rs. A. P.	Rs. A. P.	Maunds.	Rs. A. P.	Rs. A. P.
1. Paddy, Dalwa ...	22	11 6 9	35 10 3	25	12 0 6	37 12 0	21	8 3 0	26 4 2
Sarud ...	13	6 12 0	21 1 9	19	9 2 4	28 11 2	18	7 0 4	21 10 6
Beallee ...	10	5 3 1	16 2 9	13	6 4 0	19 10 2	13	5 1 2	15 10 3
2. Kullie ...	4	3 3 4	18 8 9	6	7 0 11	23 11 6	6	11 0 6	30 13 10
3. Moong ...	2½	5 8 11	10 8 4	3½	6 5 10	12 4 10	4	11 6 10	16 8 6
4. Urhur ...	2½	3 0 0	11 0 9	3½	7 0 4	13 4 0	...	...	...
5. Kooltee ...	4	3 7 11	10 15 9	7	5 8 8	17 11 6	3	4 0 3	6 14 2
6. Wheata ...	3½	6 4 9	11 4 3	3½	7 5 10	15 10 3	2½	3 1 9	13 10 6
7. Goor ...	12	71 1 8	101 1 9	14	67 3 2	104 3 0	14	63 3 6	140 0 0
8. Cotton ...	2	...	16 0 0	4	20 12 0	30 8 0	...	...	...
9. Tobacco ...	Bundles. 1,100	33 5 3	42 7 10	Bundles. 1,500	39 4 6	75 0 0	...	...	...

With this great increase in the value of produce, and with the increased quantity which will be raised off an acre by means of irrigation, it is evident that the enhanced revenue for which the Government may well look by the time the period of the next settlement arrives will probably not be less than 33 per cent. on that which is now paid in the three districts, amounting, as above shown, to a little short of 15 lakhs of Rupees, so that the income derivable from this source will probably be about Rs. 5,00,000.

The quantity of land above shown is only that subjected to assessment. To that has to be added the lakhraj and jagheer, which amount in—

	Acres.
Pooree	72,611
Cuttack	122,900
Balasore	115,650
TOTAL ...	311,161

as also about 200,000 acres of redeemable waste, or 511,060 acres, making a total in Orissa of 1,981,594 acres. Of the 1,600,000 acres for which water is provided by the canals, 370,000 belongs to the Burdwan Commissionership in the Midnapoor and Hooghly districts, leaving 1,230,000 as the irrigable area in Orissa Proper, that is, between the Chilka Lake and the river Soobunreeka.

The above mentioned statistics of land and prices have been given for Orissa only, as obtained from recent investigations. I have been unable to procure similar particulars for the districts comprised within the Burdwan Commissionership.

The item of miscellaneous revenue can at present only be conjectured.

From miscellaneous.

Enquiries have already been made relative to the sale of water to saw-mills, as also regarding fisheries, **while along the Midnapoor canals plantations of mulberry are likely to prove a considerable source of revenue. A sum of Rs. 50,000 may safely be taken for this item.**

The above mentioned gross expenditure of 277¼ lakhs distributed over the whole irrigable area will give a capital cost of Rs. 17·32 per acre, of which about 32 lakhs, or Rs. 2 per acre, may be taken as the proportion due to navigation, leaving the capital cost for irrigation, &c., somewhat under Rs. 15·32 per acre. This sum is considerably more than the works in Madras have cost, and which have not, I believe, exceeded Rs. 8 per acre, but less than is estimated for the Soane and Damoodah, and about the same as for the Gunduck Project. I am unable to account altogether for the difference between the cost of the Orissa and Godavery works, unless it is that within the last 10 years the value of money has fallen so much. The canals in Orissa are certainly on a larger scale, especially as regards the navigation, but the requirements to be provided for are, as has been before shown, greater than those in the Godavery. The amount of drainage that has to be passed in the shape of large rivers is also much greater; but, as before observed, this circumstance is not without a compensating advantage. The individual works may have been more expensively designed in some instances, and the rate of wages has been higher, especially at the Calcutta end of the works; but on the whole I think neither much superfluous labor nor materials has been expended hitherto, and I believe the estimates for the remaining work represent adequately the probable further expenditure necessary to carry the whole scheme, as above described, to completion.

Capital cost of works per acre.

The indirect sources of revenue, which the general increase of prosperity will create, it is of course impossible to estimate; but without taking these into consideration, and

Gross income from all sources.

collecting that which may be realised from the six direct sources, the eventual gross income may be assumed as follows :—

From Irrigation to 1,600,000 acres, at Rs. 2-8	...	Rs.	40,00,000
„ Navigation over 530 miles of Canal ...	...	„	5,50,000
„ Customs Dues on Exports and Imports	...	„	1,00,000
„ Waste Lands and Rent	...	„	2,00,000
„ Enhanced Land Revenue ...	...	„	5,00,000
„ Miscellaneous	...	„	50,000
TOTAL Rs.	...		54,00,000

From this sum will have to be deducted the cost of repairs and maintenance. The former may be taken at 2 per cent. on the *whole* capital cost, and the latter at 4 annas per acre. Assuming, then, that by the time the works are fully completed, the entire cost, inclusive of every item, as before explained, reaches the sums of Rs. 2,77,25,000, and that 1,600,000 acres are irrigated for the sum, the deductions to be made will be 5,54,500 for repairs and 4,00,000 for maintenance, establishment, and so forth, or a total of Rs. 9,54,500, which would leave Rs. 44,45,500 as net revenue, or about 16 per cent.; or, if the item of enhanced land revenue be omitted, 14 per cent. on the gross expenditure. If the water-rate be raised, as will doubtless be the case after a few years, and if a distinct rate be levied for cold weather crops, then the returns will of course be proportionately higher.

CALCUTTA,
The 20th November 1860.

F. H. RUNDALL, *Colonel, R. E.,*
Chief Engineer, Bengal,
Irrigation Branch.

No. 2441 I, dated 29th November, 1860.

From—*Joint Secy. to the Govt. of Bengal, P. W. Dept., Irrigation Branch,*

To—*Secretary to the Government of India, P. W. Dept.*

With reference to para. 6 of your letter No. 173 I, dated 17th June last, and subsequent correspondence, and also in continuation of my letter No. 1424 I, dated 19th July last, I am directed to forward the estimates marginally noted, amounting in the aggregate to Rs. 1,12,09,633, for those portions of the Orissa irrigation works which have hitherto been commenced, and are in course of construction, together with as many of the plans* to which these estimates refer, as have been received by this Government. The remainder, the Superintending Engineer states, will be shortly despatched; but as the estimates have been delayed so much longer than was expected, the Lieutenant Governor is desirous that no further detention should occur, and has therefore directed me to submit them in anticipation of these plans.

Nos. 75, 76, 77, 78, 79, 80, 81, 82, 83, 87, 88, 89, 127, 128, 129, 130, 140, 141, and 142 of 1869-70.

* As per list attached.

2. In explanation of the delay which has occurred, the Superintending Engineer writes as follows :—"I regret much that such a time has elapsed since these estimates were returned to me for revision, but so much of the work has been re-cast, so many details added, which were not in the original estimates, that it has only been by great exertion that these papers have been completed. I beg to remind you that of late the strength of my own office, as well as of the offices of the Executive Engineers, has been materially reduced at a time when many and voluminous returns were urgently called for."

3. Of the works provided for in the accompanying estimates, the following are either completed or nearly so :—

The Mahanuddy anicut and sluices.
„ city protective works.
„ Beropa anicut and head-works.
„ Naraje „ „
„ Kendraparah canal.
„ high leave canal, 1st section, to a limited width for 23 miles.
13 distributaries from the Kendraparah canal commanding 90,000 acres.
The anicut and head-works across the Cossye at Midnapoor.
„ „ „ „ „ at Panchkoorah.
„ three reaches of canal between Panchkoorah and the Hooghly.
„ earth-work and one lock on the tidal canal.
„ workshops at Cuttack.

4. The works in full progress are—

Completion of the 1st section of the high level canal and distributaries therefrom.
The Taldunda canal.
„ Machgong „
„ earth-work and masonry of the Midnapoor canal between Midnapoor and Panchkoorah.
„ locks on the tidal canal.
„ distributaries from the Midnapoor canal.

5. The 2nd and 3rd sections of the high level canal and the anicuts connected therewith, which had been commenced, have been stopped, agreeably to the orders contained in your letter No. 353 I, dated 1st ultimo, to which a separate reply will be addressed.

6. I am desired at the same time to forward a memorandum which has been prepared by the Chief Engineer, agreeably to the instructions contained in paras. 6 and 7 of your letter above quoted In this memorandum the particulars of the whole scheme, both as regards its professional details and its financial prospects, are carefully enumerated. The Lieutenant Governor trusts that the explanation given in the 1st and 2nd chapters of that memorandum, as to the condition of the province, and how that condition necessarily governed the principles on which the works have been projected, will satisfy the Government of India of the soundness of those principles, and that the statement of the anticipated eventual returns, which appear to the Lieutenant Governor to have been based on fairly reliable data, and on a moderate scale, is sufficiently encouraging as to its remunerative character.

7. In para. 2 of your letter No. 353I, dated 1st October, a doubt is expressed as to the expediency of proceeding with the works between the river Brahminee and the Midnapoor series "until the prospect of the works already carried out, and distributing water for irrigation proving remunerative, is more satisfactorily established." The Lieutenant Governor trusts that the particulars explained in my letter of 24th September last, No. 2002I, as well as the information conveyed in my letter of the 12th current, No. 2288 I, announcing that a good commencement of irrigation had been made from the Midnapoor canal, will have helped to remove such doubt; he himself sees no reason why the works in Orissa should not be eventually at least as remunerative as works of a similar character elsewhere, and he cannot but apprehend that to arrest the progress of the scheme in its present stage will prove a matter of regret hereafter, for the past history of the province too clearly shows that a failure of seasonable rains and the consequences may recur at any time.

8. It is perhaps necessary to explain to the Government of India that the works, as far as they have as yet been carried out, will affect only the country situated between the rivers Brahminee and Katjooree, an area of about 800 square miles, or less than one-fourth of the province. The Pooree and Balasore districts, in the first of which the late famine was earliest developed over an area of 800 square miles, and in the second of which it prevailed throughout an area of 2,000 square miles in as great, if not greater, intensity than elsewhere, will feel but little relief, inasmuch as from no works having yet been commenced therein, not only will they continue to be deprived of the means of irrigation, but for want of the navigable canals they will be shut out also from receiving

succour from the produce of those tracts to which the water will have been led by the works at present under construction.

9. The Lieutenant Governor considers it unnecessary to recapitulate the particulars entered into in the Chief Engineer's memorandum, but he is desirous of pointing out that the works as designed effectually embrace the whole area of the province, and that the proposed system of inter-communication ensures access to every portion of each of the districts into which it is divided, and will not only render it, as far as human foresight can provide, secure from scarcity, but will convert it into a granary from which other localities may be supplied in time of need.

10. The Chief Engineer, from his personal knowledge of the works and localities, is of opinion that the estimates for which sanction is now asked provide amply for the works projected. The rates appear to have been carefully fixed from the experience already gained, while the designs for the several works are based on the models of those which are already in successful operation. The only point in which the outlay may be reduced is in the number and cost of the bungalows at the sites of the locks, which were designed by the Company for the subordinate canal officers and toll collectors, and this applies only to the Taldundah, Machgong, and upper portions of the Midnapoor canals. This sum, amounting in aggregate to Rs. 32,254, has been deducted from the respective estimates. The sum of 10 per cent. allowed in some of the estimates for contingencies on the works yet remaining to be done is greater than is usually admitted in departmental estimates; but as the Chief Engineer is of opinion that in large works of this character the ordinary limit of 5 per cent. is scarcely sufficient, the Lieutenant Governor considers that it will be better to allow the higher sum to remain.

11. The ultimate cost of the entire scheme of works enumerated in the Chief Engineer's memorandum appears to be as follows :—

	Rs.	Rs.
Outlay on construction by the East India Irrigation Company in India up to 31st December 1868	48,12,605	
Tools and plant	14,19,717	
Contingencies	1,54,989	
Establishment under the East India Irrigation and Canal Company, including direction and accounts ...	23,75,765	
Balance of sum paid by Government, including *bonus* ...	16,37,424	
TOTAL UP TO 31ST DECEMBER 1868 ...	1,04,00,500	
Further expenditure up to 31st August 1869 ...	7,72,115	
Establishment	1,55,593	
Land from commencement to 31st August 1869 ...	4,87,249	
Balance of detailed estimates now submitted ...	56,24,913	1,18,15,457
Probable cost of works approximately estimated ...	76,23,608	
Establishment at 20 per cent. on ditto		1,32,48,521
		26,50,000
GRAND TOTAL OF PROJECT		2,77,13,978

12. The probable returns from the various sources enumerated in the Chief Engineer's memorandum are as follows :—

	Rs.
From irrigation to 1,600,000 acres, at Rs. 2-8	40,00,000
„ navigation over 530 miles of canal	5,50,000
„ customs dues on exports and imports	1,00,000
„ waste lands and rent	2,00,000
„ enhanced land revenue	5,00,000
„ miscellaneous	50,000
TOTAL ...	54,00,000
Deduct probable annual charge for maintenance ...	9,54,500
NET RETURN ...	44,45,500

or about 16 per cent. on the above total outlay. The returns from irrigation, it will be observed, have been based on only the amount of water-rate at present levied. *viz.*, Rs. 2-8 per acre per annum, and only on the monsoon crops.

13. Regarding the estimates for works, such as have been quite or nearly completed, and specified in para. 3, no remarks, it is presumed, are necessary, except that the submission of the estimates is required principally for the purpose of bringing the expenditure which has been incurred since the transfer of the works from the Company under proper authority.

Of the other estimates, the following sums are those which the Lieutenant Governor would recommend for sanction :—

1*st.*—For the Taldundah canal, Rs. 4,19,966, being the cost of the first 27 miles which have been estimated for in detail; for the remaining 17 miles, the cost of which has been assumed at only a mileage rate, separate estimates will be submitted hereafter.

2*nd.*—For the Machgong branch, Rs. 1,18,023, being the detailed estimates for the first 15 miles; the remaining length of the canal having also been taken at only a mileage rate.

3*rd.*—The estimates for the Midnapoor canal, exclusive of distributaries, having all been carefully worked out, the amount of Rs. 20,39,717, after deducting the bungalows which may be dispensed with, may be sanctioned.

4*th.*—The estimates for the tidal canal, which have been carefully revised, amounting to Rs. 7,98,386.

5*th.*—The distributaries from the Taldundah and Machgong canal are estimated at Rs. 2 per acre, as they will be precisely similar to those which have already been constructed from the Kendraparah, canal. The amounts are for the Taldundah canal Rs. 1,60,083, and for the Machgong Rs. 1,59,516.

6*th.*—The distributaries from the 1st section of the high level canal which have been estimated in detail at Rs. 2,36,205.

7*th.*—The distributaries in the Midnapoor canal, half of which have been nearly completed, and the cost of which has not yet reached Rs. 2 per acre. The estimate amounts to Rs. 3,13,300.

8*th.*—The estimates for the 2nd and 3rd sections of the high level canal, all of which have been estimated for in detail, amounting to Rs. 4,62,421 and Rs. 7,59,514, respectively.

9*th.*—The anicuts across the Brahminee, amounting to Rs. 4,92,042.

10*th.*—The anicuts across the Byturnee, amounting to Rs. 2,24,219.

14. The aggregate sum of all the estimates now submitted, and for which sanction is required, amounts to Rs. 1,05,00,462, while the respective totals of each estimate are as particularized below :—

	Rs.
1.—The Mahanuddy anicut and sluices	11,96,552
2.—The city protective works	47,248
3.—The Beropa anicut and head-works	3,23,587
4.—The Naraje ditto ditto	4,52,092
5.—The Kendraparah canal	7,46,967
6.—Distributaries from ditto	3,00,000
7.—The high level canal, 1st section	11,74,852
8.—Distributaries from ditto	2,36,205
9.—Weir at Panchkoorah included in Midnapoor Canal ..	20,39,717
10.—Distributaries from ditto	3,13,300
11.—Tidal canal	7,98,386
12.—Workshop buildings at Cuttack	75,772
13.—The Taldundah canal	4,19,966
14.—Distributaries from ditto	1,60,083
15.—The Machgong canal	1,18,023
16.—Distributaries from ditto	1,59,516
17.—Anicut across Brahminee	4,92,042
18.— Ditto Byturnee	2,24,219
19.—High level canal, 2nd section	4,62,421
20.— Ditto 3rd ditto	7,59,514
TOTAL ...	1,05,00,462

No. 59 I, dated 15th February, 1871.

From—The Government of India, P. W. Dept.,

To—The Joint Secretary to the Government of Bengal, P. W. Dept.

I am desired to acknowledge the receipt of your letter No. 2441 I., dated 29th November 1869, forwarding plans and estimates, amounting to Rs. 1,12,09,633, for those portions of the Orissa works which had been commenced, or were in course of construction on that date, and enclosing a report by the Chief Engineer, in which a comprehensive review of the whole scheme, both as regards probable cost and returns, is furnished.

2. So long a time has elapsed since the receipt of your letter, and the works have intermediately progressed so much further towards completion, that His Excellency the Governor General in Council considers it only necessary now to remark briefly on a few points which seem to call for notice in connection with such of the plans and estimates as it is now requisite for the Government of India to sanction, in order that the expenditure incurred since the transfer of the undertaking from the Company may be brought under proper authority.

3. The designs and arrangement of the several works seem suitable in every respect; in a few instances, however, certain requisite plans are wanting, but as the estimates have evidently undergone careful preparation, it is probable that the desired information is with the Chief Engineer, and that it was only through an oversight that the plans in question were not forwarded.

4. This remark applies especially to the tidal canal project, the data submitted for which were very scanty. As it appears that most of the earthwork of this canal, as also the greater part of the locks, had been executed previous to the transfer, and that the remaining locks are approaching completion, this estimate will be included with the rest now sanctioned. It is understood, however, that certain modifications in the designs of the locks have since been found desirable, rendering a revised estimate necessary. Such revised plans and estimates should be submitted without delay, together with detailed drawings and estimates of the iron lock-gates.

5. It is observed that a reduction has been made by the Chief Engineer in the number and size of the bungalows and canal offices (chokies) provided for in the Executive Engineers' estimates. Possibly this was thought necessary under the impression that they would be objected to by the Government of India, but there is nothing in the orders which have been issued to show that the Government of India has any desire to be parsimonious in this respect. It is probable that the remarks which have been made with regard to temporary buildings have been misunderstood to apply to permanent structures as well, but such is not the case; on the contrary, canal offices required permanently should be constructed of good material, so that the expenditure on repairs may be kept as low as possible. In this view, therefore, all the buildings which have been provided for in the several estimates may, if still considered necessary, be retained, but at the same time His Excellency in Council is of opinion that it would be well if the Hon'ble the Lieutenant Governor would cause suitable standard plans of canal bungalows and chokies to be prepared for general adoption. Possibly the same style of building may not be adapted to all localities, but a standard design is useful, though it does not of necessity impose a rigid adherence thereto under all circumstances.

6. With these remarks, His Excellency the Governor General in Council sanctions the estimates, of which the following is an abstract :—

Amounting in aggregate to Rs. 85,94,520.

	Rs.
1.—The Mahanuddy dam and sluices	11,96,552
2.—The City protective works	47,248
3.—The Beropa dam and head-works	3,23,587
4.—The Naraje dam and head-works	4,52,092
5.—The Kendraparah Canal	7,46,967
6.—Distributaries from ditto	3,00,000
7.—The High Level Canal, 1st section	11,74,852
8.—Distributaries from ditto	2,36,205
9.—The Taldundah Canal	4,35,387
10.—Distributaries from ditto	1,60,083
11.—The Machgong Canal	1,22,280
12.—Distributaries from ditto	1,59,516
13.—Workshop buildings at Cuttack	75,772
14.—Weir at Panchkoorah included in the Midnapoor Canal	20,52,293
15.—Distributaries from ditto	3,13,300
16.—The Tidal Canal	7,98,386
TOTAL ...	85,94,520

7. In intimating this sanction, I am desired to add that His Excellency the Governor General in Council regrets the delay that has occurred in replying to the Lieutenant Governor's communication, and at the same time His Excellency wishes to convey his thanks to the officers employed on the Orissa scheme for the pains which they have taken in endeavouring to comply with the requisitions of the Government of India for information on all points connected with the works.

8. It is necessary to turn now to the financial aspect of the scheme. The Chief Engineer has entered fully into this subject in his report, and the Governor General in Council is glad to observe that, in the opinion of the Lieutenant Governor, the returns from the works anticipated in that report have been based on fairly reliable data, and are sufficiently encouraging as to the ultimately remunerative character of the scheme.

9. The cost of the entire works is estimated by the Chief Engineer in round numbers at 277¼ lakhs, and the several sources of income at 54 lakhs, from which a sum of 9½ lakhs is deducted for maintenance, leaving 44½ lakhs as the probable net revenue. How much of this it may be possible to realize, it is of course premature to say; but it is satisfactory to learn from the irrigation statements lately furnished by the Government of Bengal, that a great increase has taken place in the demand for water during the past season, and that there is a marked improvement in the disposition of the cultivators to avail themselves of the canals.

10. It is understood that the irrigated area during the past season has reached to nearly 160,000 acres, of which 120,000 acres have been watered in the Cuttack district. It is understood further that it is probable that the area will next season be increased to 250,000 acres.

11. Much of this gratifying result is doubtless owing to the judicious measure taken by His Honor the Lieutenant Governor in reducing the water-rate, and His Excellency in Council now looks hopefully to such a permanent appreciation of the benefits of the canals by the people of Orissa as will lead to a general and continuous adoption of irrigation.

12. In view, therefore, of the different aspect which the question has assumed during the past year, and of the prospect of fair returns being brightened by actual experience, the Governor General in Council is of opinion that the general scheme may now be prosecuted gradually to completion, due regard being had to the quantity of labour procurable, and to the necessity for avoid-

ing any undue disturbance in prices, as also to the gradual advance in the spread of irrigation, and to the increase of traffic. With reference therefore to the remarks made in paras. 7 and 8 of the letter under acknowledgment, I am to communicate provisional sanction to the 2nd and 3rd Sections of the high level canal, subject to final approval by the Secretary of State, who will be duly informed that such provisional sanction has been accorded. In conveying this sanction, however, I am to point out that the particulars of information relating to those sections, stated in para. 3 of my letter No. 100 I., dated 22nd February 1870, to be wanting, but which it is understood are available, should be forwarded to the Government of India as soon as possible.

13. In thus intimating the assent of the Governor General in Council to the gradual prosecution of the Orissa scheme to completion, I am to observe that His Excellency continues to be still impressed with the necessity which exists of special legislation, with the object of securing more completely to the Government a return from these great works. It is the opinion of His Excellency in Council that a measure framed with this view on sound principles would ultimately prove a greater boon to the consumers of the water, than it will be a matter of security to the Government itself, and therefore His Excellency in Council desires it may be understood by the Government of Bengal that, when the Canal Bill for Northern India has been disposed of, legislation for the irrigation works in Bengal will be seriously taken in hand.

14. The estimates comprised in the 2nd and 3rd Sections of the high level canal, now provisionally sanctioned, are, in round numbers—

	Rs.
Weirs across the River Brahminee	4,92,000
Main Canal, 2nd Section, 13 miles	4,62,400
Weirs across the Byturnee...	2,24,000
Main Canal, 3rd Section	7,60,000
Distributaries on 2nd Section	2,00,000
Ditto on 3rd ditto	1,00,000
TOTAL ...	22,38,400

15. Finally, I am to suggest that instructions should now be issued for the careful preparation of plans and estimates of the remaining portions of the scheme, as laid down in the Chief Engineer's memorandum, forwarding them successively for the consideration of the Government of India, accompanied by such details as will enable the Governor General in Council to form a correct conclusion regarding the cost and financial results of each respective portion. I am further to suggest that all local names, such as 'anicut', 'calingula', and so forth, may hereafter be discarded, and the English equivalents as 'weir', 'fall', &c., be substituted wherever practicable.

16. This sanction has been registered as No. 34 I of 1870-71.

No. 35, dated 6th March, 1871.

From—The Government of India,

To—The Secretary of State for India.

In continuation of our despatch No. 84 of the 5th July 1869, we have now the honor to forward, for the information of Her Majesty's Government, copies of the papers noted below regarding the construction of irrigation works in Orissa. Amongst these papers is a comprehensive review of the whole scheme by the Chief Engineer for Irrigation in Bengal, both as regards probable cost and returns.

2. From our communication to the Bengal Government, No. 59 I., dated 15th February, your Grace will observe that, after having satisfied ourselves of

the suitability of the designs and general arrangement of the works, we have sanctioned estimates, amounting in the aggregate to Rs. 85,94,520, for works which had either already been constructed during the Irrigation Company's management, or are in course of construction, with a view to bringing the expenditure which has been incurred since the transfer of the undertaking to the State under proper authority.

3. The cost of the entire scheme, inclusive of establishments, is estimated by the Chief Engineer, in round numbers, at 277¼ lakhs, of which about 117 lakhs have been expended. The several sources of income are taken at 54 lakhs, from which a sum of 9½ lakhs is deducted for maintenance, leaving 44½ lakhs as the probable net revenue. How much of this it may be possible to realize, it is of course premature to say; but it is satisfactory to learn from the irrigation statements lately furnished by the Government of Bengal, that a great increase has taken place in the demand for water during the past season, and that there is a marked improvement in the disposition of the cultivators to avail themselves of the canals.

4. We have been informed that the irrigated area during the past season reached to nearly 160,000 acres, of which 120,000 acres were watered in the Cuttack district, and the remainder from the Midnapoor Canal, and that there is a probability of that area being next season increased to 250,000 acres.

5. In view, therefore, of the improved aspect which the question has assumed during the past year, and of the probability of fair returns being strengthened by actual experience, we are of opinion that the general scheme may now be prosecuted gradually to completion, and we have issued instructions for the careful preparation of plans and estimates for the remaining portion of the scheme, as laid down in the Chief Engineer's memorandum, with a view to their being forwarded successively for our consideration. Your Grace will observe that we have not overlooked the necessity of maintaining a due regard to the quantity of labour procurable, with a view to the avoidance of any undue disturbance in prices, as well as to the gradual advance in the spread of irrigation, and to the increase of traffic. With reference, therefore, to the remarks made in paras. 7 and 8 of the letter from the Bengal Government, No. 2441 I., dated 29th November 1869, we have likewise communicated provisional sanction to the 2nd and 3rd sections of the high level canal, subject to your Grace's final approval, which we have now the honor to solicit.

6. The estimates comprised in the 2nd and 3rd sections of the high-level canal, provisionally sanctioned by us, are, in round numbers—

	Rs.
Weirs across the River Brahminee	4,92,000
Main Canal, 2nd Section, 13 miles	4,62,400
Weirs across the Byturnee...	2,24,000
Main Canal, 3rd Section	7,60,000
Distributaries on 2nd Section	2,00,000
Ditto on 3rd ditto	1,00,000
TOTAL ...	22,38,400

The area which will be brought within reach of irrigation by these works as stated in the Chief Engineer's report, amounts to 230,000 acres, of which the estimates now sanctioned provide for distributive works capable of supplying 150,000 acres.

7. Your Grace will observe that we continue to be still impressed with the necessity which exists of special legislation with the object of securing more completely to the Government a return from these great works We have, therefore, desired it may be understood by the Government of Bengal that, when the Canal Bill for Northern India has been disposed of, legislation for the irrigation works in Bengal will be seriously taken in hand.

No. 439 I, dated Simla, the 1st September 1871.

ORDER,—By the Govt. of India, P. W. DEPT.

Read the following despatch :—

No. 48, dated London, the 27th July 1871.

From—Her Majesty's Secretary of State for India,

To—His Excellency the Right Hon'ble the Governor General of India in Council.

MY LORD,—I have received and perused with interest the papers transmitted with your Excellency's despatch No. 35 of 6th March last, relative to the irrigation works in Orissa, which have recently come into the possession of your Government by purchase from the late East Indian Irrigation and Canal Company.

2. Among the papers is a comprehensive review of the whole scheme by the Chief Engineer for Irrigation in Bengal, which seems to be based on moderate data, and according to which the state and prospects of the works are much more satisfactory than had been previously supposed. The amount already expended on them is stated at 117 lakhs, and the amount required to complete them is estimated at about 160 lakhs more, but the total net revenue is expected eventually to be at least 44½ lakhs, or 16 per cent. on the outlay; and both such experience as has already been afforded by the works themselves and analogous experience elsewhere warrant the belief that this is not an extravagant estimate.

3. I am glad, therefore, to observe that your Excellency in Council is now satisfied of the expediency of prosecuting the works gradually to conclusion, and that, besides according formal sanction to a considerable amount of past expenditure, and conditional authorization to a further outlay of Rs. 22,38,400, for which my sanction is required, you have issued instructions for the careful preparation of plans and estimates for the remaining portions of the scheme. Executive operations should, in my opinion, be pushed on henceforward as fast as possible consistently with due regard to the danger of an excessive rise in the price of labour, and to the disposition shown by the cultivators to avail themselves of the new facilities offered for irrigation and navigation.

4. The estimates just adverted to, amounting to Rs. 22,38,400, are hereby sanctioned.

I have, &c.,

(Signed), ARGYLL.

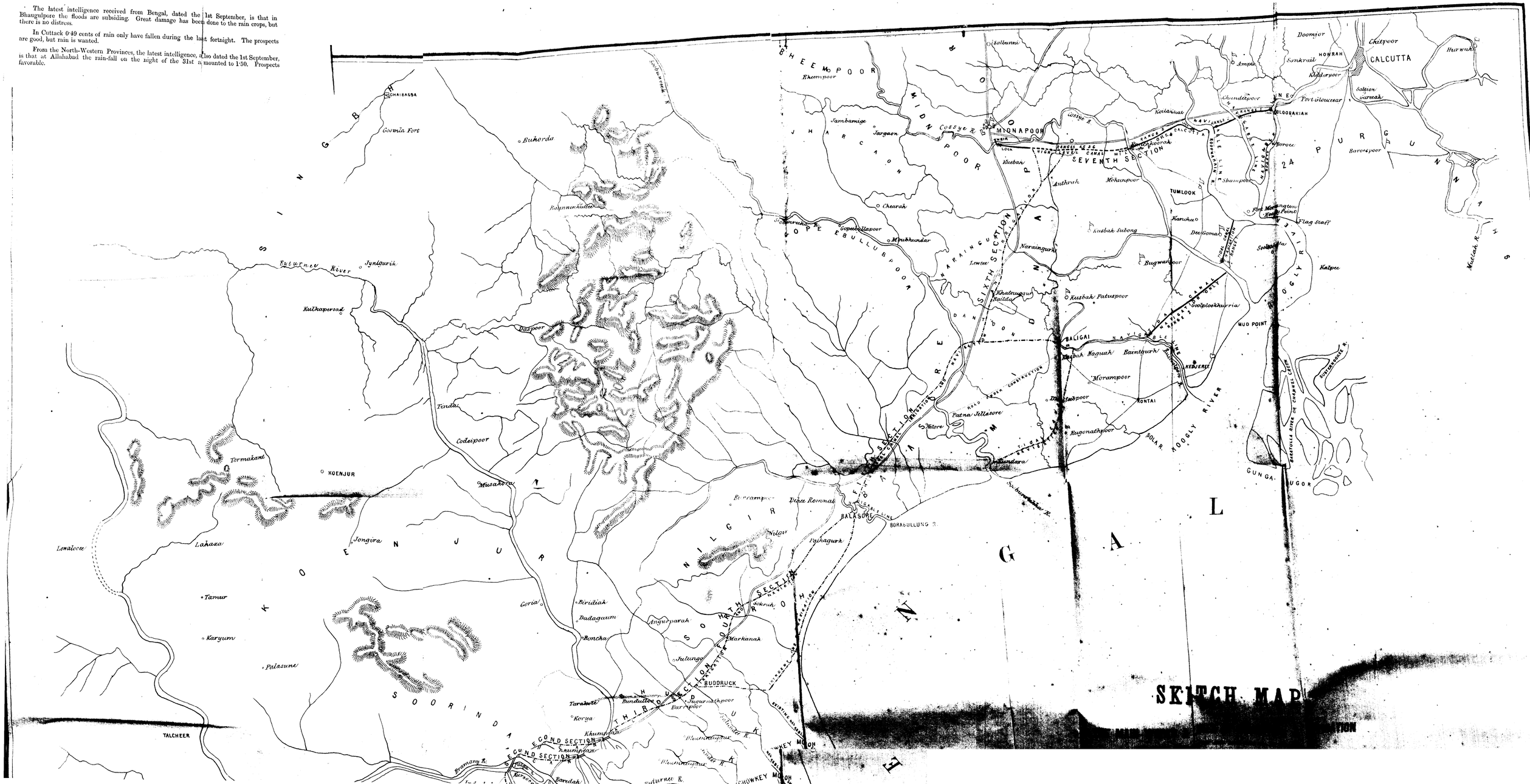
ORDER.—Ordered, that a copy of this despatch be forwarded to the Government of Bengal, in the Public Works Department, Irrigation Branch, for information, in continuation of letter No. 59 I of 15th February 1871.

Printed and Published for the GOVT. OF INDIA, *at the Office of* SUPDT. GOVT. PRINTING, 8, *Hastings Street, Calcutta.*

The latest intelligence received from Bengal, dated the 1st September, is that in Bhaugulpore the floods are subsiding. Great damage has been done to the rain crops, but there is no distress.

In Cuttack 0·49 cents of rain only have fallen during the last fortnight. The prospects are good, but rain is wanted.

From the North-Western Provinces, the latest intelligence, also dated the 1st September, is that at Allahabad the rain-fall on the night of the 31st amounted to 1·50. Prospects favorable.



Fort

Buhorda

Kuynnimhuttee

Sindhunnuck R.

Dasspoor

Tendu

Codeipoor

Musakora

Goria

Biridiah

Dadagaum

Boncha

Angurparah

Markanah

Sokruh

Julungo

Tarasoote

Bundutton

Jugurnathpoor

Barripoor

Korya

Khumpra

Bhimpoor

Kheempoor

Jambamige

Jargaon

Cossye R.

Midnapoor

Salbunni

Cossye R.

Chearah

Gopeebullapoor

Mubhundar

Soobunreeka R.

Lewtee

Naraingurh

Khatruggur

Ralida

Kusbah Patuspoor

Kusbah Subong

Anthrah

Mohaunpoor

Kusbah

Kurlakhar

Kantakoorah

Ampta

Doomjor

Sankrail

HOWRAH

Kiddepoor

Chitpoor

CALCUTTA

Hurwah

Chundeepoor

Fort Gloucesar

Saltion Gareeah

COLOORARIAH

Borooe

Baroospoor

Shampoor

TUMLOOK

Karwee

Dee Goma

Fort Mornington

Hooly Point

Flag Staff

Soolkea

Katpee

Mutiah R.

Bugwanpoor

Goolplookharria

MUD POINT

BALIGAI

Kusbah Naguah

Baintgurh

Rustumpoor R.

KEDJEREE

Morampoor

Dhuleepoor

KONTAI

Patna Jellasore

Jellasore

Rugonathpoor

Mundara

SOLA R.

HOOGLY RIVER

BARATULLA RIVER OR CHANNEL CREEK

SUBTERMOUKE R.

GUNGA

UGOR

Subunreeka R.

BALASORE

BORABULLUNG R.

Pahagurh

Nilgiri

Vehre Remnah

Burrampur

Nilgiri

Chowkey Mohun

BUDDRUCK

Jellasore

JHARCAMON

MIDNAPOOR

SEVENTH SECTION

SIXTH SECTION

NARAINGURH

DANTON

SECOND SECTION

THIRD SECTION

SOUTH

SOUTH WESTERN FRONTIER

NAVIGATION

NAVIGABLE LINE

NAVIGATION ONLY

CONSTRUCTION

EXISTING NAVIGATION

ROAD UNDER CONSTRUCTION

TIDAL CANAL

HIGH LEVEL CANAL

RANGE 1

RANGE 2

RANGE 3

RANGE 4

RANGE 5

RANGES 4 & 5

TIDAL CUT

TIDAL CUTTING

TIDAL CREEK

SALT LINE

HOOGHRAIN R.

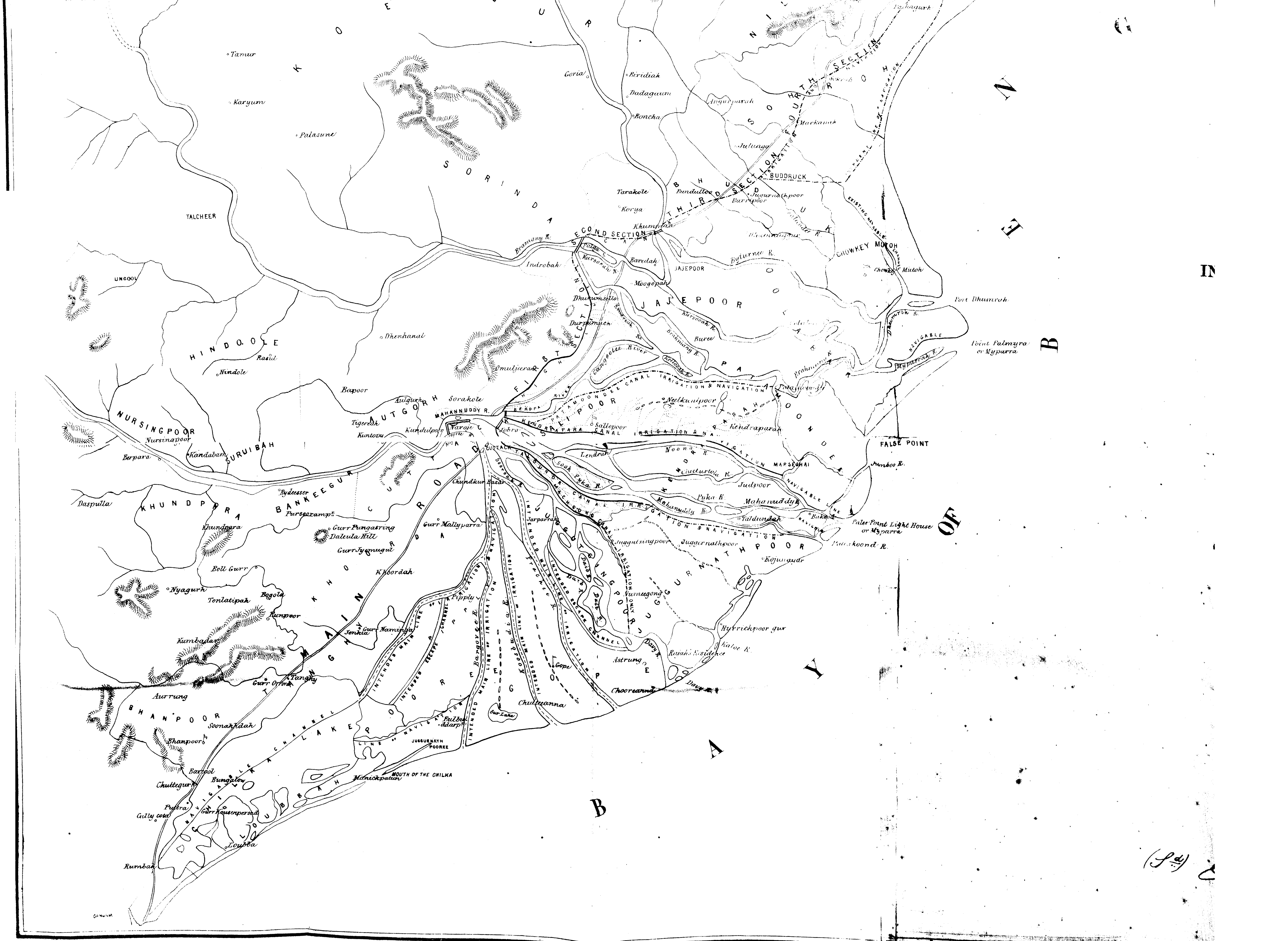
2 A

PURGUNNAHS

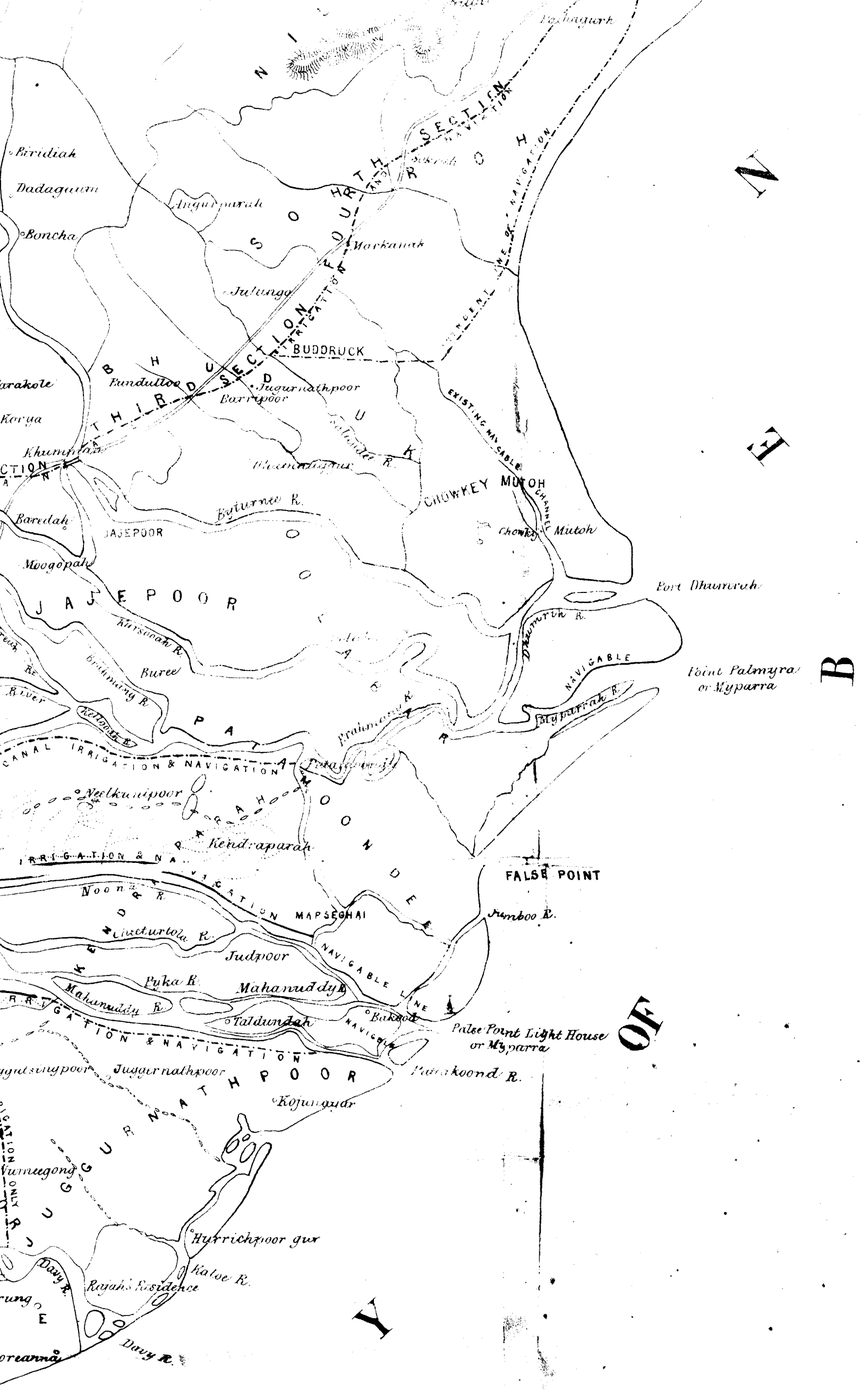
ORISSA

NUGGAL

SKETCH MAP



TALCHEER
Tamur
Karyum
Palasune
SORINDA
Goria
Biridiah
Dadagaum
Boncha
Angurparah
Markanah
Julungo
BUDDRUCK
Tarakote
Korya
Bundulloo
Jugurnathpoor
Barripoor
Khumnan
SECOND SECTION
THIRD SECTION
FOURTH SECTION
IRRIGATION & NAVIGATION
Bramany R.
Patga
Kursoaah R.
Baredah
JAJEPOOR
Byturnee R.
CHOWKEY MUTOH
Chowkey Mutoh
EXISTING NAVIGABLE CHANNEL
Port Dhumrah
Dhumrih R.
Point Palmyra or Myparra
NAVIGABLE
Myparrah R.
FALSE POINT
Jumboo R.
False Point Light House or Myparra
Patakoond R.
Indrobah
Moogopah
Dhurumsello
Durpumuch
JAJEPOOR
Kursoaah R.
Brahmany R.
Buree
Cangootee River
Kelloaah R.
FIRST SECTION
HIGH LEVEL CANAL
Omuljeerah
UNGOOL
HINDOOLE
Rasul
Hindole
Dhenhanal
Bapoor
Aulgurh
AUTGORH
Sorakote
MAHANNUDDY R.
Tigereah
Kuntopu
Kundulpoor
Naraje
Jobro
CUTTACK
BEROPA RIVER
PATAMOONDEE CANAL IRRIGATION & NAVIGATION
Neelkuntpoor
SALIPOOR
KENDRAPARA CANAL
Sallepoor
IRRIGATION & NAVIGATION
Kendraparah
KENDRAPARAH
PATAMOONDEE
Lendrah
Noona R.
Cheturtola R.
Judpoor
Soak Pyka R.
Pyka R.
Mahanuddy R.
Mahanuddy
Taldundah
Bakood
MARSEGHAI
NAVIGABLE LINE
TALDUNDA CANAL IRRIGATION & NAVIGATION
MACHGONG CANAL IRRIGATION ONLY
Juggutsingpoor
Juggernathpoor
JUGGURNATHPOOR
Kojungur
JUGGUTSINGPOOR
Numeegong
Daib R.
Hurrichpoor gur
Katoe R.
Rajah's Residence
Astrung
Davy R.
Chooreanna
NURSINGPOOR
Nursinapoor
Kandabam
SURUIBAH
Berpara
Daspulla
KHUNDPARA
Khundpara
BANKEEGUR
Bydeesser
Purseerampr.
CUTTACK ROAD
Chundkur Bazar
Gurr Mallyparra
Gurr Pungasring
Daltula Hill
Gurr Jyemugut
Khoordah
KHOORDAH
Boll Gurr
Nyagurh
Tonlatipah
Bogola
Runpoor
Kumbadar
Jenkia
Gurr Naminga
Pipply
MAIN ROAD
Tanghy
Gurr Orrora
Aurrung
BHANPOOR
Soonakhdah
Bhanpoor
Barcool
Chuttegurh
Bungalow
Puttra
Gilly cota
Gurr Kousenpersad
Loubba
Rumbah
CHILKA LAKE
NAVIGABLE CHANNEL
LOUBBAH
Manickpatun
MOUTH OF THE CHILKA
JUGGURNATH POOREE
LINE OF NAVIGATION
Bulbru ddarpr.
INTENDED MAIN LINE OF IRRIGATION
INTENDED ESCAPE CHANNEL
Bargovee R.
Koosbudia R.
Prachee R.
POOREE
Gope
Chutteeanna
Sur Lake
B A Y O F B E N G
(Sd)



SKETCH MAP

SHOWING

THE MAIN WORKS & LINES OF IRRIGATION & NAVIGATION

NOW UNDER CONSTRUCTION AND PROPOSED TO BE CONSTRUCTED

IN ORISSA AND ADJACENT DISTRICTS.

AS

COMPRISED IN THE ORISSA UNDERTAKING,

MAY 1870.

Scale 8 miles to an inch.

NOTE OF S. W. CIRCLE.

In this sketch only the comple[ted] seven miles of High Level Canal [from] is shewn as completed.

[ed] Locks and Weirs are shewn—not those in progress. The first [fur] as 1st Lift Lock at Lachmutpoor having been opened to traffic

REFERENCE

Canal Completed or partially so and opened.
Do. under construction.
Do. Proposed but not commenced.
Annicut and Head Sluices.
Drainage.
Escape Channels.

(Sd) [illegible] Lieut. Colonel M.S.C.
Offg Supt Engineer S.W. Circle

(Sd) [illegible] Colonel R.E.
Joint Secretary to the Govt of Bengal
P.W.D. Irrigation Branch.

No. 41 of 1871.

SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, OCTOBER 28, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

Non-Subscribers to the GAZETTE *may receive the* SUPPLEMENT *separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.*

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA *is required by Law, of which it has been customary to publish in the* CALCUTTA GAZETTE, *will be included in the* SUPPLEMENT. *For such Orders and Notifications the body of the* GAZETTE *must be looked to.*

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Report on Coal Exploration in the Chanda District.

From MR. MARK FRYAR, Mining Engineer, to the Commissioner, Nagpur Division,—No. 234, dated Warora Colliery, Chanda, Central Provinces, the 23rd July 1871.

I BEG to acknowledge the receipt of your letter No. 2359, dated 28th June 1871, in which you say that the Chief Commissioner desires that a general report upon the coal explorations should be submitted, and that this report should give a brief summary of past operations from the beginning, showing the cost of the same and the results obtained. Accordingly, I have now the honour to submit to you the following brief summary of the work which has been done in the Chanda District, in the way of putting down bore-holes and pits to prove the existence and quality of coal-beds, and of the expenditure incurred on account of each work.

2. Earth borings for proving coal were commenced by me in the neighbourhood of the city of Chanda on the 22nd May 1869. Prior to this, a boring had been made on the South-East side of the Chanda walls, near the dâk bungalow, by the Deputy Commissioner (Major Lucie Smith). This was put down to a depth of about 180 feet, and was said to have passed through about 20 feet of shaly rock containing coal stains or thin layers of coal.

3. For the sake of clearness and brevity, I have divided the places where borings have been made into the following, *viz.*, Chanda, Ballarpur, Gugus, Telwassa, Telwassa to Nandori, North from Warora, and Warora.

Commencing with Chanda and its neighbourhood we have the following records, viz.:

CHANDA.—I.

Names of Bore-holes.	Dates. Commenced.	Dates. Finished.	Depth in feet.	Results.	Cost of boring.	Contingencies	Office.	Total.
Chanda.	1869.				Rs. A. P.	Rs A. P.	Rs. A. P.	Rs. A. P.
Nos. 1 and 2 ...	May 22nd ...	June 5th ...	80 & 40	Sandstones and soft decomposed stones	22 12 0	122 4 3	.....	145 0 3
* No. 3 ...	June 6th ...	July 16th ...	242	At about 162 feet, 2 feet of coal, and at 206, 1 foot 6 inches of coal and shale	249 14 0	817 7 4	.....	1,067 5 4
„ 6 ...	Sept. 19th ..	Nov. 30th ...	238	Was stopped by the Superintendent, Geological Survey, when in coaly shale, had penetrated this for 11 feet	700 5 4	749 15 1	201 11 9	1,651 12 2
„ 6 A ...	.....	.....	...	Put down by steam borer, but lost by running together, there being no tubes at the time to prevent this	.....	.....	.....	1,364 12 11
								4,228 14 8
	1869.			BALLARPUR.—II.				
Ballarpur No. 1	July 21st ...	Aug. 14th ...	74	Surface soil and pebble bed. The river bank	120 8 0	199 15 1	68 1 6	338 8 7
				ft. in.				
				At 109 feet good coal ... 0 9				
				Black shale ... 0 9				
†Ballarpur No. 2	Aug. 15th ...	Sept. 18th ...	172	Good coal ... 1 6	496 14 6	251 9 3	41 7 0	789 14 9
	1870.			At 40 feet coal ... 3 0				
‡ No. 3 ...	Jan. 9th ...	Jan. 29th ...	118	„ 71 „ coal shaly ... 2 0	293 1 0	40 [illegible] 2	.....	333 4 2
				At 51 feet coal shaly ... 1 0				
				Good coal ... 2 0				
				At 101 feet coal shaly ... 1 4				
No. 4 ...	Jan. 30th ...	March 7th...	200	„ 182 „ good coal ... 3 0	510 1 10	42 2 0	.....	552 3 10
								2,013 15 4
				GUGUS.—II.				
	1869	1870		ft. in. ft. in.				
				At 45 0 coal ... 4 0				
				51 10 coal ... 3 6				
				60 8 coal ... 3 6				
				81 0 coal ... 9 0				
				100 10 coal ... 21 8				
Gugus No. 3 ...	Nov. 5th ...	Jan. 8th ...	143	122 8 coal ... 13 0	328 12 2	23 10 9	.....	352 6 11
				At 124 6 coal ... 3 0				
				129 6 coal ... 3 0				
				138 6 coal ... 4 0				
				151 6 coal ... 7 0				
No. 4 ...	Dec. 16th ...	Feb. 5th ...	206	169 0 coal ... 32 0	599 15 1	324 9 6	.....	924 8 7
Gugus § Pit No. 1 ...	.....	.....	...	.....	152 0 0	55 14 6	.....	207 14 6
				At 80 0 Coal ... 8 0				
				Shale ... 11 6				
				Coal ... 13 0				
				Shale ... 11 6				
|| No. 2 ...	The Mayo Pit.		...	Coal ... 8 6	.....	.....	.....	25,532 11 1
								27,017 9 1

* This seems to be below the good coal-bearing horizon of the field.
† In the same stratum apparently as the No. 3 boring at Chanda.
‡ Put down by Dr. Oldham. This seems to be in the same stratum as No.
§ Sunk to recover lost boring tools and rods.
|| The first bore-hole at Gugus was put down where No. 2 pit (the Mayo Pit) was afterwards put down to the coal: 470 tons of coal have been raised from this pit; part of this was conveyed to Railway and Bombay Gas Works to be experimented on as well as Warora new mining for engine fuel.

TELWASSA.—IV.

Names of Bore-holes.	Dates. Commenced.	Dates. Finished.	Depth in feet.	Results.	Cost of boring.	Contingencies.	Office.	Total.
					Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Bandak.	1869			Passed through surface soil into the Talchir beds under the				
No. 1 ...	Dec. 1st ...	Dec. 9th ...	23½	coal-bearing sandstones ...	50 0 6	40 7 0	.....	90 7 6
				ft. in. ft. in.				
				At 150 0 Coal ... 1 6				
				165 0 Coal ... 0 8				
Telwassa.	1869	1870		Shale mixed				
No. 1 ...	Dec. 9th ...	Jan. 22nd ...	187	with coal... 20 8	187 12 0	115 7 7	70 15 9	374 3 4
				At 68 ft. Coal ... 29 0				
				Shale ... 1 6				
				Coal ... 4 5				
				Shale ... 12 9				
No. 2 ...	Dec. 13th ...	Jan. 17th ...	140	Coal ... 11 2	143 0 2	39 2 0	.....	182 2 4
								646 13 2
				TELWASSA TO NANDORI.—V.			Total for 1869 ...	33,947 4 3
Kunara.	1870			No coal; beds of sandstone and				
No. 1 ...	March 16th..	April 5th ...	180	clay	133 0 0	114 4 9	58 1 5	305 6 2
Majri.								
No. 1 ...	March 14th..	March 21st..	82	No coal	147 5 2	69 12 0	.....	217 1 2
„ 2 ...	March 22nd	April 9th ...	127	At 75 ft. 3 in. coal 50 ft. 8 in.	269 14 3	109 8 0	.....	379 6 3
* Nandori								
No. 1 ...	April 16th...	May 30th ...	214	No coal	489 4 0	119 2 0	.....	608 6 0
„ 2 ...	May 31st ...	June 13th ...	134	No coal	174 10 0	7 3 0	.....	181 13 0
								1,692 0 7
				NORTH FROM WARORA.—VI.				
Ekona.	1870.			No coal-hole in hard rock below				
No. 1 ...	April 23rd...	May 29th ...	40	the coal-bearing sandstone ...	245 2 0	136 8 0	131 13 11	513 7 11
	1870	1871						
† No. 2 ...	Decr. 15th.	Jany. 7th ...	155	Sandstone, no coal ...	231 2 6	21 10 6	.....	252 13 0
	1871							
„ 3 ...	Jany. 7th.	Feby. 6th ...	177	Ditto ditto ...	214 15 0	36 15 0	.....	251 14 0
„ 4 ...	Jany. 16th.	Feby. 6th ...	134	Ditto ditto ...	183 1 0	53 4 8	.....	236 5 8
Kundara.	1871		about					
No. 1 ...	...	March ...	200	No coal ...	216 6 0	50 8 0	.....	266 14 0
Nagpur.								
No. 1 ...	...	...	...	Not known ...	.....	1,376 11 0	.....	1,376 11 0
								2,898 1 7
				WARORA.—VII.				
Warora.	1870							
No. 1 ...	May 30th.	July 26th ...	220	No coal ...	450 11 3	576 5 4	124 14 0	1,151 14 7
„ 2 ...	Oct. 15th.	Oct. 20th ...	56	Put down through surface	44 15 3	1 0 0	.....	45 13 3
Akapur.				deposits to prove the sand-		10 7 0	.....	40 5 0
No. 1 ...	July 27th	July 30th ...	37	stone.	29 14 0	9 7 0	.....	48 13 0
„ 2 ...	Augt. 2nd	Augt. 6th ...	40		39 6 0			
				ft. in.				
				At 102 ft. Coal 4 6				
				Coal sha[illegible] 1 0				
				Coal 7 6				
				Sandy sh[illegible] 1 6				
				Coaly sh[illegible] 3 0				
„ 3 ...	Augt. 8th.	Sept. 14th...	158	Coal 17 0	262 6 6	48 7 9	.....	310 14 3
„ 4 ...	Sept. 1st ...	Sept. 10th...	103	To prove strata—put down to coal horizon	74 13 8	3 4 0	.....	78 1 8
								1,675 15 9
„ 5 ...	Sept. 12th...	Oct. 3rd ...	120	Into thick clay beds ...	135 11 4	14 1 0	.....	149 12 4

* These two holes passed through sandstone strata into decomposed trap rock.
† The borings Nos. 2, 3, and 4 at Ekona were put down in consequence of coal being said to have been found in a similar stratum on the Berar side of the river Wardha.

WARORA VII.—*continued.*

Names of Bore-holes.	Dates. Commenced.	Dates. Finished.	Depth in feet.	Results.	Cost of boring.	Contingencies.	Office.	Total.
					Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Akapur.	1870							
No. 6 ...	Sept. 15th...	Oct. 3rd ...	93	At 69 feet, coal 10 feet ...	109 6 6	2 15 0	.....	112 5 6
„ 7 ...	Oct. 5th ..	Oct. 18th ...	133	At 103 ft. 6 ins. coal 13 ft. Coal shale 4 ft.	108 14 6	0 14 0	.....	109 12 6
„ 8 ...	Oct. 5th ...	Oct. 14th ...	105		89 14 6	1 2 0	.....	91 0 6
„ 9 ...	Oct. 20th ...	Nov. 16th ...	166		196 5 0	18 15 0	.....	215 4 0
								678 2 10
		1871		Borings made to prove the existence of the coal-bearing sandstones in the vicinity of Warora preparatory to commencing pit sinking.				
„ 10 ...	Nov. 23rd ...	Jany. 5th ...	197		315 11 6	36 11 6	.....	352 7 0
Yekarjoon.		1870						
No. 1 ...	Oct. 20th ...	Nov. 4th ...	96		113 7 3	2 0 0	.....	115 7 3
„ 2 ...	Nov. 10th ...	Dec. 13th ...	156		276 13 6	4 3 0	.....	281 0 1
				By Steam Borer.				
Warora.								
No. 1 ...	June 11th ...	Aug. 16th ...	250	No coal, but firm stratum of sandstone with 44 feet of interbedded blue shale ...	1,523 12 3	887 11 2	1,049 7 11	3,460 15 4
„ 2 ...	Sept. 3rd ..	Sept. 26th...	140		781 0 3	608 0 4	573 0 9	1,962 1 4
								5,819 8 0
							Total for 1870 ...	12,763 12 9
Akapur.	1870	1871		At 176 ft. 6 in., coal 3 ft. 6 in. Shale 8 „ 6 „				
* No. 1 ...	December.	Jany. 7th	194	Coal 8 „ 6 „	1,816 7 4	1,052 12 8	270 7 3	3,139 11 5
Cleaning Warora well				By the orders of the Commissioner, Nagpur ...	.....	.....	.....	86 6 9
Iron smelting furnace.	.....			An experiment made to smelt the rich iron oxides of Chanda with the coal from Gugus. A rich slag was obtained, but owing to weakness of available blast this could not be reduced	.....	.....	.....	147 3 0
	1871							
Warora Pit ...	Jany. 10th			In course of sinking at the position of No. 1 Akapur boring. The shaft is now about 60 feet deep, and is yielding water at the rate of at least 60 gallons per minute. This water is being raised to the surface by a pumping engine of 15 nominal H. P. Owing to the softness of the sandstone in the present bottom of the pit, not only is much labour and expense incurred by having to support the sides of the pit by masonry and wood, but in addition to this drawback on the progress of the work the sand from the disentegrated rock rises with the water in the pumps causing a rapid wear of bucket leather and necessitating a change of buckets about every twelve hours. The sandstone is now fortunately becoming harder, as found by increasing depth, so that in another week I anticipate that the difficulties referred to will have disappeared, or at any rate will have become much lessened.	4,013 15 4	25,364 12 5	549 1 8	29,927 13 5
								33,301 2 7
								352 7 0
								33,653 9 7

* Owing to the difficulty met with in boring through the coal with the cutting tool of the steam borer, this boring was stopped before the whole coal stratum was proved, but a sufficient thickness of workable coal-bed was proved to justify pit sinking.

MARK FRYAR.

From Mr. Mark Fryar, Mining Engineer, to the Commissioner, Nagpur Division,—No. 266, dated Warora Colliery, Chanda, Central Provinces, the 14th August 1871.

Replying to your letter No. 3041, dated 12th August 1871, and with reference to letter to you from Assistant Secretary to the Chief Commissioner, No. 1726-189, dated Nagpur, 10th August 1871, I have the honour to state that my report "showing the general result and cost of the Chanda coal operations from the commencement" includes the salaries of the staff with the following exceptions, *viz.*:

	1868-69.	1869-70.	1870-71.
	Rs. A. P.	Rs. A. P.	Rs. A. P.
Salary and allowances of Mr. Mark Fryar ...	...	...	10,810 0 0
Ditto ditto of Mr. Mather ...	...	1,028 11 3	250 0 0
Ditto ditto of Serjeant Carson...	1,271 6 2	1,650 3 4	1,720 11 0

The whole expenditure incurred in connection with the coal-boring operations in the Chanda District up to end of 1870-71 has been as follows:

	Rs.	A.	P.
1868-69	6,719	3	8
1869-70	41,517	8	5
1870-71	48,818	14	8
Total ...	97,055	10	9

Result of the Experimental Cultivation of Carolina Paddy Seed in the North-Western Provinces during 1870.

Allahabad Division.

Allahabad.—The Collector distributed the seed among Dr. Pilcher, Superintendent of the Central Jail, Baboo Pearee Mohun, a Pleader of the High Court, and a Mr. Carbery.

Dr. Pilcher reports that his experiment was a failure; 17 chittacks of seed were sown, the yield was 12 chittacks and 15 seers of straw. The seed was sown on 1¾ biswas of land, which was not manured, but irrigated. He states that many of the ears were empty, but cannot account for this.

Baboo Pearee Mohun planted his seed under the bund of a tank; the bund burst, and the whole was washed away.

Mr. Carbery has not reported the result of his experiment, although repeatedly asked to do so. In this District, the experiment has not been fairly tried. It can only be by chance if experiments of this kind succeed in the hands of mere amateurs, and if they fail in their hands, the impression must remain that there might have been some ignorance or mismanagement which would have been avoided had the experiment been carried out by professional cultivators.

Cawnpore.—The experiment in this District has been a total failure owing to the rains having set in unusually early and swamped the seed that was sown. The Collector is desirous of trying the experiment on various conditions of soil and cultivation. The Commissioner recommends that a good supply be placed at the Collector's disposal.

Humeerpore.—The Collector of this District alone is able to submit a report showing satisfactorily that under similar circumstances the yield of Carolina rice exceeds the out-turn from at least one kind of the ordinary country grain. His method of conducting the experiment was to sow an equal area in the same field with foreign and country seed, and to treat both alike. Unluckily, the amount of seed varied; but the outturn was 18 seers produce out of 15 chittacks of Carolina seed, and 20 seers produce out of 3 seers country seed. This was in Muhoba alone; the site selected was the bed of a tank, and probably this experiment was carried out under favorable conditions. In other places, the experiment failed: in one case, the crop was destroyed by cattle; in another, unsuitable land was selected. Commissioner suggests that Mr. Harrison may be entrusted with seed to carry out further experiments in another season.

Jounpore.—The Deputy Collector sowed some seed in the municipal garden, the result was 13 lbs of clean grain out of 2½ lbs of seed.

Banda and Futtehpore.—In these two Districts the experiments were a total failure: the heavy rain early in the season quite destroyed the growing plants.

The Commissioner of Allahabad, in submitting the above reports, remarks that to have such an experiment satisfactorily carried out, it is essential to have a good supply of seed early, so that there may be no hurry in distributing it or in selecting fields for the purpose; also states that simple instructions should be issued to the District Officers. They should be directed to select at least six or eight localities, to choose land adapted for rice in general, and not to try what they can make out of unlikely kinds of soil, to sow half of each selected field with the Carolina and the usual country grain in equal proportions of seed, and to treat each alike, and then to report the out-turn. If any difference in cultivation suggests itself, it should be carefully tried and reported.

Rohilkhund Division.

Bijnour.—The quantity of seed assigned to this District is reported as being very small: it was distributed among Mr. Tresham, a zemindar, and several Natives. Mr. Tresham reports very favourably indeed of the result of his experiment, but the Natives seem to have been less fortunate. The Collector recommends that Mr. Tresham be allowed to try the experiment again this year on rather a larger scale. It may be said that the experiment has not altogether succeeded, for the yield is rather less than half that of country seed both in grain and straw; but, with care and plenty of water, which is essential, the result might be better.

Moradabad.—Ten pounds were sent to this District, which, when winnowed and cleaned, yielded 6¼ lbs. As the rainy season had been for some past years rather uncertain, the Collector thought it best to try the sowing in several rather than in two or three spots. Accordingly, the seed was distributed in various quantities to 12 respectable farmers, who appear in some cases especially to have taken considerable care in carrying out the Collector's directions. They were instructed to sow broad-cast about one-fourth of the weight usually sown with common country seed. The four best out-turns were given from sowings made in the first week of July, while the crop was cut in the third and fourth weeks in October. Of the 6¼ lbs., 11 oz. were swamped after sowing, leaving 5 lbs. 10 oz. sown in 13½ biswas pucca in ten different villages. The yield, on the whole, was 148 lbs. of rice, giving an average of 26 fold. One of the farmers, whose experiment was somewhat successfull, wishes to try the sowing again next year with double the quantity he first received. The other six cases were rather feeble and require no notice. The Collector has kept the present crop for the purpose of distributing the seed in larger quantities this year. Collector will be glad to learn results of other Districts and any direction the Board may be pleased to issue regarding the time which may be found to be the best for sowing, and the quantity which may have been found best for a certain area.

Budaon.—No experiments were tried in this District.

Bareilly.—The amount of paddy seed received in this District was 5 seers. Three seers of this was sown in the Deputy Collector's garden at Pilleebheet, the remainder by two landlords in Baheree. The experiments in the garden proved again the great amount of moisture this variety of rice requires. Two of the beds were more wet than the remaining two; in the former the stalks of each plant varied from 10 to 12, in the latter from 7 to 8. The head of an average looking plant when counted gave 365 grains, of which 332 were good and the rest empty. The out-turn was above the average of country rice, but the produce is coarser than even 3rd class rice. The seed given to one zemindar germinated, but failed ultimately, and that to the other gave an out-turn in the proportion of about 2½ pucca Bareilly maunds to the beegah, which is well above average.

Shahjehanpore.—Mr. J. Powell, of the Rosa Factory, reports that as he had no proper rice lands in this District, it was thought best to sow the rice in different soils under different circumstances, *i. e.* (1) *in low land liable to inundation;* (2) *on the side of a jheel where the land had not been previously well worked;* (3) *in a garden plot.* The seed was first sown and afterwards the plants were laid out singly or in pairs: it was then found that each plant shot out from 6 to 10 strong stems. In the low land liable to inundation, the show of plant was magnificent; but a flood came and entirely swamped a portion, and, in receding, left a slime on the leaves; these plants sickened, the ears came out weakly, and did not fill well. Where the plants were not altogether swamped, the return was excellent. By the side of the jheel the out-turn was not good; the plants were immersed in water at the time of seeding. In the garden, where the plants never had more than an inch of water on them, and where the ground was only just moist at the time of seeding, the crop was beautiful, a picture to look at, the grain of a bright golden hue, every ear pendent, stalks high and strong. Mr. Powell concludes that the rice is suitable to all lands which can be kept fairly moistened for two months, or that may have from two to four inches of water on during that time,

provided the lands are properly prepared and weeded. The seed should not be sown until the end of July, as the rice matures early and should not be allowed to ripen before September.

Kumaon Division.

Kumaon.—Commissioner stated, in October last, that part of the paddy was then quite green, and that he did not expect he would be able to report on the out-turn until the close of November. He now reports that in consequence of the great sickness at the important time, the seed was neglected, and that no satisfactory data can be given. Commissioner tried some with servants to look after it, but they fell sick, and the wild pigs destroyed it.

Meerut Division.

Allygurh.—The Collector reports that the seed was made over to the Secundra Rao Tehseeldar for trial, as that part of the District is most damp. A portion was given to two cultivators, who sowed it in marshy land, and who gave their best attention to its cultivation; but the result is quite a failure, the grain produced being very small, and stalk short and unhealthy. Mr. Chase is of opinion that the climate of Allygurh is not suitable to rice, and that it does not appear advisable to continue the trials of any paddy seed.

Dehra Doon.—Superintendent says that the plants that were transplanted throve best, but the continued heavy rain did not agree with the plant, or rather it was the absence of sun that did the harm. The average produce of Carolina paddy would be by the results about 15 maunds to the acre; ordinary country rice produce about 25 maunds. There can be no doubt but that the Carolina paddy would thrive well in the Doon, and would produce about 30 maunds to the acre if properly tended; but Mr. Ross doubts if it would ever come into much favor: it is so coarse and utterly without flavor; none but the poorest of the poor would eat it.

Saharunpore.—Collector states that so small a quantity of seed was sent him that he distributed the whole (8¼ seers) to one Kour Sein, of Harotee. The result is the same as that described in Mr. Webster's letter last year (1869). In vigor, amount of produce, and especially in strength and size of stalk, it far exceeds the Native rice. Kour Sein sowed also 9 seers of last year's (1869) seed in a field. The crop was a fine one, and quite as high and strong as the new seed crop, but the out-turn was not quite so good. Mr. Jenkinson recommends that this experiment should be tried again next year, for in introducing a new kind of rice it is most important to ascertain whether the seed, produced in this country, continues equal to the imported seed, or whether it deteriorates, and states that it would not befair to come to any conclusion on this point from only a single experiment carried out on so small a scale. The cultivation of this Carolina rice by Kour Sein has been so successful that Collector is sure that if seed were obtainable, it would be very extensively sown, and that in time it would perhaps entirely take the place of the Native rice. The Collector further states that the Carolina rice is coarser than Native rice, but in flavour is only inferior to the best Native rice, and that the Natives are of opinion that it is equal to the 2nd quality of rice produced in the District, and will have no objection to take to Carolina rice.

Mozuffernugger.—Collector forwards a report drawn up by the Assistant Collector, and states that he is afraid the experiments must be looked upon as a failure; for the result on Oodey Ram's land, four maunds from 12 biswas, would only give about 6½ maunds per beegah, and this for good land and well watered, would be an indifferent crop of ordinary Indian grain. Collector himself saw the particular field to which reference is made, and before the paddy was cut it struck his eye as in appearance below the ordinary average. The Commissioner, in submitting the reports, remarks that there is so much similarity in soils, in humidity of atmosphere, and in water-supply, in Saharunpore and Mozuffernugger that he would certainly suppose the results to be identical, whereas it will be seen that they are contrary. Mr. Lind concludes that the cultivation was carefully attended to in the former District, and neglected in the latter. Adverting to the objection urged by Mr. Ross in regard to the rice being coarse and without flavour, Commissioner states that the nutritive qualities of the grain can best be ascertained by chemistry, but he can hardly fancy the zemindars of Saharunpore would be eager in enquiries after the seed, if the rice is so poor as described by the Superintendent of the Doon.

Collector forwards another report by Mr. Cadell, the Settlement Officer, whose "experiments have been far more satisfactory, and offer a far better guide to the probable capabilities of the seed, under favorable conditions and with intelligent management, than the experiments which were made under superintendence of the District officials, and which were reported on by Mr. Donovan." Mr. Palmer says that if seed is to be again distributed next season, it would probably be best to entrust direction of the cultivation to Mr. Cadell, and to confine the experiment to those estates in which, as agent for the Court of Wards, he is able entirely to control its working.

Benares Division.

Ghazeepore.—States that before the receipt of the Carolina paddy seed from the Board some was procured from the Agricultural Society, so that the amount sown in his District was larger than in others. Adds that the seed sown under his personal superintendence near the Cutcherry was a failure; that throughout the District it met in several places with unfavorable weather; but in many cases succeeded well and produced from 8 to 16-fold crops.

Azimgurh.—Collector states that the 13 lbs. of Carolina seed received from Commissioner's office, 8 lbs. was sown under the personal supervision of Mr. Sladen in June last. The seed was sown in land belonging to zemindars of a village adjoining the Collector's house; some in the manner in which the Natives sow their own rice, some in drills prepared after the fashion described by the American Consul in his memorandum submitted to the Government of India. Owing to the excessive rains the experiment was unsuccessful. The seed sown in the drills in damp ground was drenched by the rain and did not even germinate. The other seeds germinated, and the rice grew to some height, but rotted within a month from superabundant rain.

Collector adds that Mr. Sladen received about 5 lbs. of the seed this year for experiment, but that the fact was not brought to his notice, nor was he aware of the existence of the seed till informed by Commissioner. The season for sowing rice has now passed, but the result of the sowing the seed will be looked after by Collector; at present it seems to be that the seed is not suited for a country where the rains are heavy and continuous.

Mirzapore.—Collector reports that the Carolina paddy seed received by him was distributed among several gentlemen, of whom only one furnished the result of his experiment, which was a failure. This gentleman states that "he sowed the seed in ordinary garden ground, but that it was attacked by a kind of insect which destroyed the grain by perforating the grain while yet in the milky stage and leaving it quite empty. Of the two seers sown all the plants germinated; but the yield of the grain was 1¾ seers, or half less than was actually sown."

Goruckpore.—Collector states that last year the Carolina paddy seed was distributed to a Mr. Palmer and a certain zemindar in Deorea. Mr. Palmer reports that the result has not been good owing to the plants having been destroyed by inundation and flies, and that he will make a further trial this year from the small quantity of the paddy he has secured. The Deoreea zemindar reports that the plants were destroyed by heavy rains, the plants being under water for some time.

A further supply of paddy seed has been sent to the zemindar for this year's trial, being the half retained of the seed sent in 1870.

Benares.—Commissioner, in submitting the above reports, states that it is apparent that the season was unfavourable for the experiment, and that moreover from the Goruckpore and Mirzapore reports it is evident that the seed, when sown, is liable to attack from insects. The system of distributing new varieties of seeds, &c., for experimental culture, unless to officers who take an interest in such matters, must, the Commissioner fears, prove a failure, and regrets now that he did not keep a portion for Benares, and supervise it himself. Is of opinion that to give a seer to one man and a seer to another, as was done in the cases reported, can never profit. Adds that there is a public garden in Benares, superintended by a skilled gardener; but that the institution lives from hand to mouth, depending on petty subscriptions; its value for experiments is consequently reduced to the lowest.

Board of Revenue, N. W. P.,
Allahabad;
The 23rd September 1871.

A. COLVIN,
Secretary.

Extract paragraph 8 *of letter No.* 393, *dated* 20*th April* 1871, *from the Superintendent, Botanical Gardens, North-Western Provinces.*

8. *Carolina Paddy.*—This rice has been grown on a small scale; 3 lbs. were sown in a small plot of land in June last, and transplanted on to a kutcha beegah of land, and was cut down in October. The out-turn was 471 lbs. or about 6 maunds, equal to a yield of about 80 maunds per acre. An adjoining Native farmer, Koer Singh, obtained 32 maunds per acre. The straw was about 5 feet in height and most luxuriant.

Report on Analysis of bark yielded by the Government Chinchona Plantations, Madras.

Extract from the Proceedings of the Government of Fort St. George, Revenue Department,—No. 1686, dated the 26th September 1871.

READ the following:

From J. BROUGHTON, Esq., Government Quinologist, to the Secretary to the Government, Fort St. George, Revenue Department,—dated Ootacamund, the 31st July 1871.

As in certain former reports I have the honour to adduce analyses, which express the changes in the composition of our oldest barks during the past two years. The following table expresses the amount of alkaloids in the trunk bark of the oldest trees of *C. Succirubra* in the month of May, the period of maximum yield in the respective years. The amount is expressed in percentages of dry bark:

	1868.	1869.	1870.	1871.
Total alkaloids	6·74	7·43	7·60	7·85
Total sulphates obtained...	6·06	6·43	6·00	5·45
Quinine	2·40	1·72	1·73	1·80
Chinchonidine and chinchonine	4·34	5·71	5·87	6·05
Sulphate of quinine obtained crystallized	2·21	1·51	1·40	1·15
Sulphate of chinchonidine obtained crystallized	3·85	4·92	4·60	4·30

2. The above analyses show that up to May 1871 the total amount of alkaloids in the red bark had continued to increase. But as I had the honour to mention in a report dated 17th August 1868 (Proceedings, Madras Government, 22nd September 1868, No. 334, Revenue Department) as being highly probable to occur, the annual increments diminish in amount—a circumstance with indicates that the bark is arriving at its maximum of yield. The numbers which approximately express the annual increments during the period of my observations are 0·75, 0·69, 0·17, 0·25. The circumstance that these numbers do not accurately express a regular diminution of increment, is doubtless attributable to the difficulty which occurs in collecting in successive years a sample, which shall accurately represent the mean yield of the bark of a large number of trees, together with the difficulty in collecting the samples each year under precisely comparable circumstances.

3. From certain results obtained in the comparison of the analyses of barks that have been treated with moss, with those of the natural unmossed bark, I am strongly inclined to believe that if the bark of our oldest trees has not actually reached the age of its greatest yield, it must have very nearly approached it. As this is a point of some importance, which cannot be held decided without positive proof hereafter being obtained, I here merely mention my personal opinion.

4. In a report appearing (Proceedings, Madras Government, 22nd February 1869, No. 235, paragraph 4), I had occasion to mention that the amount of quinine had diminished during past years in the red barks, although that of the total alkaloids had increased. During the last two years, it appears that the amount of quinine has remained nearly constant, and probably in years to come its amount will hereafter remain nearly stationary in our red bark.

5. From the above analyses it also seems probable that the amount of obtainable crystallized sulphate of chinchonidine is diminishing with the increase of age. But with the present evidence I cannot hold this yet to be quite clear, since the determination of the amount of crystallized sulphates is apt to be modified by circumstances other than the real amount of pure alkaloid, which latter it only approximately indicates.

6. The large amount of variation according to circumstance of growth met with in the bark of *C. Officinalis*, renders a precise determination of its *mean* quality, a work of great

difficulty. I here quote certain analyses of this bark calculated in percentages of its dry state:

Crown Bark from Dodabetta Plantation.

	I. Trees of good growth, 6 years 6 months of age.	II. Trees of good growth, 5 years 9 months of age.	III. Oldest trees.	IV. Trees of fine growth.
Total alkaloids	5·26	3·10	6·53	6·91
Quinine	3·48	1·62	4·18	4·71
Chinchonidine and chinchonine	1·78	1·50	2·35	2·20
Sulphate of quinine obtained crystallized	3·25	1·64	4·17	4·80
Sulphate of chinchonidine obtained crystallized ...	2·04	1·14	1·37	1·60

Crown Bark from Neddivuttum Plantation.

	Trees, 6 years 9 months of age.	Trees, 6 years 3 months of age, of good growth.
Total alkaloids	[illegible]	6·01
Quinine	3·03	4·19
Chinchonidine and chinchonine	1·93	1·32
Sulphate of quinine obtained crystallized	3·14	4·24
Sulphate of chinchonidine obtained crystallized	1·05	1·39

7. The above analyses, though comparatively useless to determine the alteration of the bark with age, are adduced as showing the high quality of the barks. Though it falls without my province to speak of the improvement in the growth of the *C. Officinalis* trees, yet I cannot forbear to remark that a low yield is getting much less frequent in their bark than formerly. Both the crown barks of Dodabetta Plantation, which consists entirely of this species, and those of Neddivuttum are improving in quality. The increase in the yield of alkaloids is quite apparent, although I cannot with accuracy express its actual amount. This increase is due to quinine, and at present it actually appears probable that hereafter the total yield of alkaloids will equal that of the red bark. These two kinds divide between them nearly the whole of our plantations. For European quinine manufacture, the bark of *C. Officinalis* is admirably suited, as it is so rich in quinine. In addition, it is easy to work, and the sulphate of quinine crystallizes with great readiness and purity. It is especially the bark for export to Europe. A small quantity is now packed for sending to England, and I trust that from time to time its export may be continued.

8. In total yield the bark of *C. Succirubra* is the richest, but in its natural state at least, this consists mainly of chinchonidine, chinchonine, and occasionally quinidine—alkaloids which custom and the addition of fresh names, coincident with the first separation of these substances, have kept out of extensive theraputical use. The medical reports of the Chinchona Commissioners of the Indian Presidencies and the report on the medical use of "amorphous quinine" appear to indicate that these alkaloids, and consequently red bark, is the kind that can be employed most usefully in India. In Europe the price of the natural red bark will hereafter sink, when it is brought into competition with crown bark. How far by

careful special cultivation of the red bark it may hereafter be possible to modify this result, it would at present be premature to speculate.

9. After the above kinds, the most important at present cultivated on the plantations is undoubtedly that of *C. Calisaya*. As in my former reports the trees of Calisaya were very young, it is quite natural to find the amount of alkaloids in the bark has increased. The most remarkable point about the plants of *C. Calisaya* is the great number of varieties. These display almost every habit. As it was necessary to examine the bark of the trees of most marked character, in order to determine the kind most suitable for cultivation, these varieties have taken up much time. I have the honor to quote the analyses of several of these varieties. The alkaloids are given in percentages contained in dry bark.

Trunk Bark of C. Calisaya grown at Neddivuttum.

	I.	II.	III.	IV.	V.
Total alkaloids	3·95	3·93	5·28	4·16	5·36
Quinine	2·67	3·18	1·02	2·50	4·67
Chinchonidine and chinchonine ...	1·28	0·75	4·26	1·66	0·69

10. These represent fairly the different yields I have met with among the kinds of *C. Calisaya* raised from seed obtained from Mr. Money. They are as a whole of good quality; but No. V., or the bark of a variety with broad leaves, which are red in the under surface and of vigorous habit, is the kind which should be propagated, as it is the one whose cultivation can be most profitably extended. I have examined the bark of several other varieties besides those whose analyses are given above, but find them all inferior to No. V., and promising nothing remarkable in their qualities. The bark of our *C. Calisaya* is of excellent quality, aud is better suited for quinine manufacturer's use than that of *C. Succirubra*. I regret that a larger number of the trees has not been planted, but as the yield of bark from the present plantations will shortly be so large, I cannot now recommend any considerable extension, even with this sort.

11. In a report appearing in Proceedings, Madras Government, Revenue Department No. 334, paragraphs 22 and 23, I had occasion to remark that in the barks of the *C. Succirubra* and *Officinalis* a high mean temperature appeared unfavorable to the production of quinine, that alkaloid occurs more readily in the bark of trees grown at high elevations within certain limits. I have met with a remarkable illustration of this principle also in the bark of *C. Peruviana*. The bark of this tree, grown at Neddivuttum, generally contains no quinine whatever, and at best contains it in so small an amount that it is with difficulty it can be clearly detected. But the Superintendent of the Plantations has, with great judgment, experimentally planted several of these trees at Dadabetta Plantation, where they grow with much difficulty from the cold being too great for them. An analysis of the bark of one of these trees gave the following results, to which, for comparison, I attach an analysis of the bark grown at Neddivuttum.

Dodabetta.		Neddivuttum.	
Total alkaloids	2·06	Total alkaloids	6·25
Quinine	0·79	Soluble in ether	0·41
Chinchonidine and chinchonine ...	1·27	Chinchonidine	2·00
		Chinchonine	3·84
Sulphate of quinine obtained crystallized	0·67		
Sulphate of chinchonidine obtained crystallized ...	0·94	Sulphate of chinchonidine obtained crystallized ...	1·80

Though the bark of *C. Peruviana* from Neddivuttum contained a small amount of alkaloid soluble in ether, it was not quinine. But by growing the same species at the higher elevation of Dodabetta Plantation, its bark quite alters its character, and yields in analysis an amount of pure quinine, which readily crystallizes as sulphate. Indeed, the bark thus grown, far more resembles the bark of *C. Succirubra* than a grey bark. I cannot but consider this instance of a total change of alkaloid, by increase of elevation, a most interesting one.

12. The occurrence of several remarkable varieties among the trees raised from seed has directed my attention to the occurrence of hybrids among our species of chinchona. In one instance I was able, from the account given by Mr. C. Dawson, then Assistant Superintendent at Neddivuttum, to directly trace the origin of a very beautiful plant, which was found to be a hybrid between *C. Succirubra* and *Micrantha*. This plant was picked up a seedling under a tree of the latter. I analysed its bark and found its yield was poor, but represented a a mean between the qualities of the two species. Examination among seedling trees led to the discovery of many other examples of hybridism, especially to cross-breeds between *C. Succirubra* and *Officinalis*. In 1870 I communicated a short memoir on the subject to the Linnæan Society.* The occurrence of the demorphic varieties *macho* and *hewbra*, in each species of chinchona was shown in this communication to render cross-breeding highly probable, in the same manner as has been shown by Darwin to occur in *Primula*, *Oxalis*, and other plants. I learn from the discussion which took place on the subject at the Society's meeting that the fact of the tendency of chinchona to hybridism was considered proved. Since that time I have made numerous analyses of the bark of various hybrids that I have observed, but in no one instance have I found any of special excellence. In fact, it appears to me that these hybrids combine the bad qualities of both their parents. I therefore do not quote the analyses.

* Read March 3rd, 1870.

13. I cannot but think that this ready hybridism between the species of chinchona affords an explanation of the occurrence of the numerous *varieties*, which have been recognized by botanists. I observe, for instance, that a most recent classification gives 33 undoubted species, and nearly 80 separate varieties of chinchona. On our plantations there are several plants which, though certainly hybrids, would undoubtedly be made into species by a botanist ignorant of their origin. It seems, therefore, not improbable that several species, to which a separate name has been attributed, may be only South American hybrids. It is to be hoped that in any future botanical classification of the genus, this circumstance may be borne in mind.

14. This fact of the inter-breeding of the species renders the seed of a tree, surrounded with many others of a different kind, subject to considerable uncertainty of producing all plants like its parent. As a fact the seeds of the variety I called provisionally *lanceolata* gave but few plants which resembled their parent, and consequently the seedlings had to be discarded. As the tree producing the seeds was surrounded on all sides by the ordinary crown barks, the variation in the seedlings becomes intelligible.

15. I observe that Dr. Weddell in his "Notes sur les Quinquinas" (Annales des Sciences Naturelles, 5 e. serie, Tomes XI. and XII.) and at the suggestion of Mr. Howard, calls the valuable variety I called *lanceolata* above alluded to, *Chinchona Officinalis*, *Bonplandiana*, *Angustifolia*, remarking that *lanceolata* does not express so well as *Angustifolia* the peculiar shaped leaf. I would suggest that the name *Angustifolia* be, in future, adopted as the name of the variety.

16. In several preceding reports I have abundantly stated my convictions, and their grounds, for considering that living chinchona bark has its yield of alkaloids injured by exposure to sunlight. The experimental evidence of this already adduced appears to me to be quite conclusive of the fact, so that further proof is scarcely needed. Further proof appears, however, in the circumstance of which I have been for some time aware, that the bark of opposite sides of the same tree differs in yield of alkaloids. This, of course, is only fully apparent in trees that are equally exposed to sunlight on each side, which from the site of the plantations, does not generally occur. But the following analyses express the yields of the bark taken respectively from the north and south sides of a tree which is equally exposed on all sides. The bark was taken July 25th, 1871.

	North side.	South side.
Total alkaloids	3·18	3·80
Quinine	0·62	1·40
Chinchonidine and chinchonine	2·56	2·40

17. As the sun has been on the north side of the tree for the last four months, the effect has been that the yield of alkaloids has been diminished 0·68 per cent. This decrease

apparently consists of quinine, which is commercially the most valuable of the alkaloids. This effect has been produced in spite of its being the most cloudy period of the year.

ORDER THEREON.

ORDERED, that the above paper be forwarded for the information of the Right Honourable the Secretary of State, and that copies be as usual furnished to the Governments of India and of the other Presidencies, and of Ceylon, the Straits Settlements, Batavia, and the French Settlements in India.

2. The fact noted by Mr. Broughton are of much interest, especially as regards the effect of altitude and sunlight on the production of quinine. The attention of Mr. McIvor, the Superintendent of Chinchona Plantations, will be specially directed to the apparent ready hybridisation noticed by Mr. Broughton, in view to steps being taken to isolate plants of the more valuable kinds for the production of pure seed.

(True Extract.)

W. HUDLESTON,
Secretary to Government, Fort St. George.

Improvement of the public health of Calcutta since the introduction of the new water-supply.

From DR. J. M. CUNINGHAM, Sanitary Commissioner with the Government of India, to the Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce,—No. 410, dated Simla, the 13th June 1871.

As directed in Home Department No. 2387 (Public), dated the 15th ultimo, I have the honor to submit, for the information of His Excellency the Governor General in Council, all the statistics I have been able to procure regarding the mortality from cholera and other diseases in the town of Calcutta in provious years, so as to afford a means of comparison with the deaths from like causes in 1870, in the early part of which year the water-works were brought into operation.

2. This information has been derived partly from an interesting pamphlet, "On the Mortality of Culcutta during the 20 years ending 31st December 1860," by Surgeon H. M. Macpherson, of the Bengal Army, and partly from the annual reports of the Health Officer of the town.

3. For the four years, 1861 to 1864, I regret that I have been unable to obtain any data regarding the number of deaths in Calcutta, or the causes to which they were due. I have delayed replying to the letter now under reference in the hope of being able to fill in the figures for these years, but Dr. Tonnerre informs me that they cannot be procured.

4. In the annexed statement the comparative mortality from cholera is given in each year from 1841 to 1860 as taken from Dr. Macpherson's tables, and from 1865 to 1870 as extracted from Dr. Tonnerre's reports. I have been unable to ascertain with any precision how far the statistics of these two periods can properly be compared. Dr. Macpherson states that his "Tables refer to Calcutta within the Mahratta Ditch;" Dr. Tonnerre's statements "include the deaths which have occurred within the street boundaries of the town as defined by the proclamation of the Governor General in Council, dated May 1793, which are also the limits within which the census was taken."

5. This census, which was made in 1866, shows a total population of 374,500; for the earlier years the number of inhabitants is not known. The population, however, has certainly not decreased, and the area now embraced in registration appears to be considerably greater than that included in Dr. Macpherson's tables. In neither of these respects, therefore, do the statistics of 1870 gain any unfair advantage over those of the previous years.

6. How far in either period they can be relied upon as strictly accurate it is difficult to say. In all probability they all, more or less, under-estimate the mortality; but as registration has of late years received much more attention than it did formerly, it may, I believe, be assumed that the figures for the past five years are nearer the truth than those from 1841 to 1860.

7. The great diminution in the mortality from cholera in 1870, especially if it be considered in connection with the points just mentioned, is very remarkable. The deaths from this cause numbered only 1,563, or about one-half of what occurred in the most favorable of the 25 years with which comparison can be made.

8. Regarding other causes of mortality details are wanting. Dr. Macpherson in his tables, in addition to cholera, specifies no other disease except small-pox. In the ten years from 1841 to 1850, the deaths from this cause are stated to have averaged 970 annually. In the next ten years—1851 to 1860—an average of only 388 is shewn. During the last six years the deaths from diarrhœa, dysentery, fever, and small-pox are given as follows. Dysentery shows a marked diminution in 1870, as compared with any one of the previous five years; but the same remark does not apply to the other diseases named:

Diseases.	1865.	1866.	1867.	1868.	1869.	1870.
Diarrhœa	981	1,251	832	730	174	662
Dysentery	2,291	2,555	1,708	1,682	1,835	1,038
Fever	5,369	5,258	3,866	3,676	3,831	3,596
Small-pox	4,920	83	35	42	39	151

Statement showing the Annual Mortality from Cholera in the Town of Calcutta in each of the 20 *years,* 1841 *to* 1860, *and also in each of the* 6 *years,* 1865 *to* 1870.

Year.	Christians.	Hindoos.	Mahomedans.	Total.	Remarks.
1841	*	3,417	1,760	5,177	
1842	*	5,198	1,350	6,545	
1843	*	2,572	1,168	3,739	
1844	*	4,061	1,750	5,811	
1845	*	4,335	1,905	6,240	
1846	*	4,301	2,126	6,427	
1847	*	2,071	970	3,041	* For these years the deaths among any class of Christians are not shown.
1848	*	1,450	1,052	2,502	
1849	*	2,602	1,265	3,867	
1850	*	2,324	1,024	3,348	
1851	*	3,089	1,285	4,374	
1852 [illegible]	*	[illegible]			
1853 [illegible]	[illegible]				
1854	*	2,169	913	3,082	
1855	*	2,794	950	3,744	
1856	121†	3,458	1,082	4,540	† The figures shown in these years represent deaths from cholera only among persons of purely European birth and parentage, and are not included in the totals which have been taken as they stand from Dr. Macpherson's tables.
1857	145†	2,584	1,254	3,838	
1858	188†	3,653	1,542	5,195	
1859	97†	3,126	1,550	4,676	
1860	165†	4,255	2,298	6,553	
1861	No statistics procurable.				
1862					
1863					
1864					
1865	184	3,653	1,239	5,076	
1866	308	4,615	1,900	6,823	
1867	85	1,468	715	2,268	
1868	143	2,817	1,218	4,178	
1869	123	2,358	1,111	3,592	
1870	61	1,141	361	1,563	

J. M. CUNINGHAM,
Sanitary Commr. with the Govt. of India.

From A. O. HUME, ESQ., C. B., Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce, to the Sanitary Commissioner with the Government of India,—No. 12, dated Simla, the 28th June 1871.

I AM directed to acknowledge the receipt of your letter No. 410, dated the 13th instant, submitting statistics of mortality from cholera and other diseases before and after the introduction of the new water-supply in Calcutta.

2. In reply, I am desired to observe that, although there has certainly been a marked decrease of cholera in Calcutta during the past year, yet, in the opinion of the Governor General in Council, it would be premature to conclude that this was due to the improved water-supply. You are requested to bear the point in mind, and to report further when you shall have fuller data before you.

From the Government of India, to Her Majesty's Secretary of State for India,—No. 2, dated Simla, the 30th June 1871.

WE have the honor to forward, for your Grace's information, in continuation of our despatch in the Home Department, No. 63 (Public), dated the 16th ultimo, the papers noted on the margin, relating to the influence which the new system of water-supply has had on the health of the inhabitants of Calcutta.

Home Department letter to Sanitary Commissioner, No. 2387, dated 15th May 1871.
Reply from Sanitary Commissioner, No. 410, dated 13th June 1871.
Further letter to Sanitary Commissioner, No. 12, dated 28th June 1871.

2. The statistics furnished by our Sanitary Commissioner are sufficiently striking, the decrease in cholera being specially marked; but, having in view the brief period that has elapsed since the introduction of the new system, we think the figures are not conclusive, and that it would be premature to attribute the decrease in cholera to the improved water-supply.

3. We have, therefore, requested Dr. Cuningham not to lose sight of this important matter, and we shall not fail to transmit to your Grace in due course the further report he has been desired to submit hereafter, based on more ample data and more extended experience.

From Her Majesty's Secretary of State for India, to the Government of India,—No. 18, dated India Office, London, the 13th July 1871.

THE despatch of your Excellency in Council, in the Public Department, dated 16th May No. 63 of 1871, forwarding a report from the Justices of the Peace for the town of Calcutta on the working of Act I. (Bengal Council) of 1870, has been considered by me in Council.

2. In reply, I have to express my satisfaction that Calcutta is now supplied with pure water, and that the Native inhabitants gladly avail themselves of the boon.

From Her Majesty's Secretary of State for India, to the Government of India,—No. 28, dated India Office, London, the 20th September 1871.

THE despatch of your Lordship in Council, dated 30th June, No. 2 of 1871 (Sanitary), forwarding a communication from the Sanitary Commissioner with your Excellency's Government, relating to the influence which the improved system of water-supply has had on the health of the inhabitants of Calcutta, has been considered by me in Council.

2. I forward, in reply, copy of a letter* from the Army Sanitary Commission, to whom the correspondence was submitted. I agree with the Commission and with your Lordship's Government in the opinion that the statistics given by Dr. Cuningham can hardly be accepted as conclusive regarding the point in question, though the reduction of mortality from cholera since the new water-supply has been introduced into Calcutta is very striking.

* Dated 22nd August 1871.

3. I concur also with the Army Sanitary Commission in the praise bestowed by them on the municipal authorities of Calcutta for the effective manner in which, in a comparatively short space of time, the inhabitants of that city have been provided with an abundant supply of good water—a measure from which the most fortunate results may be confidently expected.

From J. J. FREDERICK, ESQ., Secretary to the Army Sanitary Commission, to the Under Secretary of State for India,—dated War Office, London, the 22nd August 1871.

WITH reference to Mr. Merivale's letter of the 16th instant, forwarding, for submission to the Army Sanitary Commission and for any remarks they may wish to offer, copy of a despatch from the Government of India, dated 30th June (No. 2) 1871, Sanitary, with enclosures, shewing the effect of the improved system of water-supply upon the health of the inhabitants of Calcutta. In returning the enclosures as requested, I am directed to acquaint you, for the information of the Secretary of State for India in Council, that the Commission, after consideration of the facts stated regarding the great reduction in mortality from Asiatic cholera at Calcutta since the introduction of the new water-supply into that city, cannot give a decided opinion as to the relation in which the two facts stand to each other until more experience has been obtained.

They admit, however, the very striking character of the coincidence; but they are disposed to place more value on the gradual reduction of mortality since sanitary improvements were first commenced.

Taking it for granted that the disease and mortality statistics are approximately correct, these shew that the sanitary work done by the municipal authorities has been attended by results to health of a very marked character which have already more than compensated the community for the outlay. The municipal authorities of Calcutta and their officers have, moreover, in the opinion of the Commission, set an example of enlightened administration and effective expenditure to other Indian municipalities which, it is hoped, will be followed. There are, indeed, few, cities anywhere which can shew so much good work done in so short a time, and with such promising results for the future.

The Forests of Moldavia.

Report by the French Consul at Jassy to the Government of the Emperor.

(From the Revue des Eaux et Forêts.)

MOLDAVIA formerly ranked among the most richly-wooded countries of Europe. The principal trees there met with are the fir, oaks of various species, ash, maple, birch, linden, wild cherry, hornbeam, elm, beech, walnut, and poplar. Unfortunately, the absence of a proper working system from the commencement has led to the destruction of all the best descriptions of trees, and to a consequent diminution in the yield of the forests.

The Moldavian forests may be classed in two distinct categories,—(1) the forests of the Carpathians, and (2) those of the secondary ranges and plains.

Notwithstanding the continued heavy fellings to which they have been subjected, the forests of the Carpathians still contain a large amount of timber of which the predominating species is the fir.

This timber is usually worked up (1) into round logs, which are carted out to supply the saw-mills set up on the Bistritza, Troutouch, and Moldava rivers; (2) into spars and mass pieces for ships; and (3) into squared beams of various lengths and thickness.

The demand for fir timber in Moldavia is very considerable, arising from the custom which prevails of building largely in wood, especially in rural districts where stone is not procurable; while the consumption of it is much increased by the export of large quantities of planks, beams, and other scantlings which are conveyed down the rivers Bistritza and Sereth as far as Galatz, whence they are shipped to Constantinople.

With the exception of fir, which is used for building purposes and to supply the saw-mills, the rest of the Carpathian forests supply only firewood. Almost all the inhabitants of these mountains are engaged in work in the forests,—some being employed in felling and transporting the logs to the saw-mills, or in squaring timber, while others gain a livelihood by purchasing planks, scantlings, and firewood, which they convey to market in the cities and sell by the waggon-load.

It is a subject of much regret that these magnificent forests have never been worked on any regular system,—the only plan pursued being to fell any tree that is selected, no attention being paid to the destruction caused in cutting it down and carrying it away. Thus, in large tracts of forest, while the finest trees have been cut down on all sides, numbers of others may be seen partially destroyed and injured by the felling and carrying away of the first. The wasteful practice, too, prevails of felling the trees very high above the ground, two feet and even three feet and upwards not being unusual, with the natural result of an enormous loss of timber and much impediment to natural reproduction.

The saw-mills fed from the Moldavian forests are of very rude construction, the machinery being of wood, and they certainly employ six times the power by which the same work could be done with better machinery. The water-works, moreover, are so faulty in design and construction, that they do not utilize more than half the volume of water available; and in fact it may be fairly said that, on a moderate estimate, an average loss of three-fourths of the motive power results from the primitive construction of these works. In 1861, some good saw-mills, worked by steam, were set up in well-selected spots especially at Largo, in one of the secondary valleys opening on the Bistritza. It was found necessary, however, to abandon them on account of the difficulty of obtaining good workmen to effect the constant repairs they required.

The forests of the secondary ranges and plains contain all the species of timber found in France. The species most commonly met with are the beech and the linden; the oak, hornbeam, poplar, and other species are also found, but in smaller quantity. These forests are very numerous. In Lower Moldavia, however, in the neighbourhood of Galatz and at Cahoul, Ismail and Belgrade (Bessarabia and Roumania), the country is quite bare, consisting of immense plains, where even a few scattered trees are seldom found.

The forests of the secondary ranges and the plains are chiefly utilized for firewood, timber for building purposes, clap-boards, hoops and wood for fencing.

The chief object of the fellings is firewood. The traffic in this direction, however, diminishes in proportion to the distance of the forests from the towns, because the cost of transport being very great, the prices of the timber reach so high that they prohibit any attempts at transport.

The owners of forests so situated as to render firewood cutting unprofitable, set up brandy-distilleries near their forests and find a use for their timber in the manufacture of charcoal for the distilleries.

The unit of measurement for firewood is the cubic sagène (cubic mètres 2·24). The price of one sagène of hard wood (hornbeam, oak, beech) varies at Jassy according to circumstances. It sells sometimes for 4 ducats (47 francs), sometimes 5 ducats (58 francs), and sometimes dearer still. Last year, for instance, it fetched 6 ducats (70 francs, 60 centimes). In winter, and especially when the rains make communication very difficult, the price frequently rises to 10 ducats (117 francs, 50 centimes). But near the Carpathians, taking the town of Bakau as the starting point, the same sagène of wood is sold during the fine season,

owing to the proximity of the forests, at much lower prices, *i. e.*, at prices ranging from 10 to 12 francs.

A tolerably large quantity of wood is cut for carts. This wood is almost monopolized by the great centres, such as Jassy, Galatz, Roman, Bakan, Fokchani, &c.; and there is an equally great demand in the villages by the cartwright peasants (rotars) who subsist by making extremely solid wheels for bullock-carts and the small light carriages (*carouzza*) of the country.

The building timber yielded by the forests of the secondary ranges and the plains is worked on a large scale, as in the Carpathians. Fir is selected in preference to all other timber, because it is softer and less troublesome to work than the oak, beech, and hornbeam. Even beams and other large logs required in building are made of fir in preference to harder woods.

Clap-boards are cut in oak forests far away from towns; they are good in appearance and quality. They are used in the country in considerable numbers,—the fabrication of wine and brandy requiring an enormous quantity of casks of all sizes.

Hoop-wood is also largely, but badly, cut. Instead of so regulating the felling as to make it conducive to the better preservation of young forests by clearing parts that are too close, it is done at random and carelessly. Thus, the workman, in splitting one twig of hornbeam, oak, &c., capable of turning out two hoops, does not care if, in the operation, he destroys the neighbouring twigs. The consequence is that, though for the moment handsome profits are realized for the proprietor of the forest, a store of undoubted loss and damage is laid up in the future. The hoops cut in the forests are sold at between five and six francs the hundred twigs, according to thickness.

The cutting of wood for fencing, which is carried on with the same negligence as the cutting of hoops, is also a cause of destruction to the forests. This is the result of the freedom left to the buyer himself to cut, uncontrolled, the twigs he requires. The damage caused by this custom is all the greater in consequence of an enormous consumption of such wood arising out of the custom prevailing here, for the preservation of the harvests during the winter, of surrounding the buildings of every farm with fences which are generally destroyed either by the peasants or by cattle, and which have to be repaired or renewed every year. Fences of this kind consist of stakes spaced out at a distance of eighteen inches apart, on which are twisted to the height of 4½ feet thin twigs, generally eighteen feet in length. Besides the fencing, many of these twigs are used for the support of vines.

Among other products obtained from the forests may be mentioned resin, potass, bark, tinder, and charcoal. The last is made from average sized branches and thick faggot wood. In those forests, which are so far away from the towns that the transport of firewood is impossible on account of the cost, the proprietors make charcoal, of course only when they find it to their advantage to do so. The pieces of charcoal are generally small, in consequence of bad manufacture. It fetches at Jassy 10, 15, and 20 paras the ocque, according to season, 8·3 centimes, 12·5 centimes, and 16·6 centimes.

It is needless to say that the forests of the secondary ranges and the plains have been worked as recklessly as those of the Carpathians, and that, therefore, the injury done has been as great.

It follows from the above that the forests of Moldavia may be considered at present to have been almost exhausted by the wasteful system of working which has hitherto been followed. The Government has, it is true, latterly adopted some measures of conservancy in its own forests, as well as in those which are private property, by demarcating reserves and laying down systems of management. But these tardy measures are now too late to repair at once the immense damage inflicted; and many years must elapse before any such returns can be obtained as ought to be expected, if the forests had been worked with method and intelligence. And this leads me to the conclusion that the exportation of Moldavian timber to other parts of Europe, which might have been largely developed in consequence of the new railways in course of construction, will continue to be, as it has always been, extremely restricted.

Reports on the state of the Season and prospects of the Crops.

GENERAL REMARKS.—Prospects are much the same as they were a fortnight ago. In Bengal, the North-Western Provinces, Madras, the Central Provinces, British Burmah, Sindh, Mysore, and Central India, the previous more or less favorable anticipations are confirmed. In Oudh, much injury has been done by the floods, but prospects are nevertheless good.

In Bombay, the Punjab, East Berar, and parts of Rajpootana, the continued absence of rain is much felt, and the aspect of affairs in those Provinces is not encouraging.

From West Berar no report has been received.

The accounts of the cotton crop are, on the whole, promising.

No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Government or Local Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
1	MADRAS	Masulipatam ...	October 25	1·03	October 26	Rain insufficient; canals and tanks low. The dry crops have been harvested and the yield is fair. Standing crops need rain.	Government satisfied with prospects of season and markets.
		Nagapatam ...	,,	4·31	,,	Prospects good.	
		Kurnool ...	,,	·31	,,	Crops generally fair; slightly suffering on poor soils from drought.	
		Trichinopoly ...	,,	3·24	,,	Crops flourishing. Prospects good.	
		Calicut ...	,,	6·	,,	Prospects good.	
		Khandeish ...	,,	*Nil.*	,,	Prospects very bad. Early crops have almost entirely failed. Prices rising.	Cotton crop in Ahmedabad and Kaira healthy and fresh; in Surat and Broach in fair condition; in Khandeish unpromising; in Shikarpore fair, and in Oomerkote favourable. Except in the Southern Maratha Country, the general prospects are not good. In Khandeish, they are very bad.
2	BOMBAY	Dharwar ...	,,	2·99	,,	A plentiful fall of rain throughout the Collectorate. Rice crop revived in places. Early crops generally in good condition. Sowing of late crops in progress.	
		Sholapore ...	,,	*Nil.*	,,	Rabbee crops suffering.	
		Ahmedabad ...	,,	*Nil.*	,,	Prospects of rice not very good; of other crops, only fair.	
3	SIND	.....	,,	*Nil.*	,,	Khureef crops generally good. The harvest has commenced.	Cotton fair in some Districts. In Kurrachee and Hyderabad indifferent, and slightly injured by fog and dew. Wheat from 9½ to 14 seers per rupee. Bajree 13½ to 16 seers. White jowary 21. Bad fever and cough prevalent in frontier Districts.
		Burdwan ...	,,	...	,,	Weather fair; crops good and promising, except in inundated parts. Hot in Bancoorah; crops suffering from want of rain.	
4	BENGAL	Bhaugulpore ...	21	...	,,	Weather fair; crops good. Cold weather crops are being sown in Rajmehal. In Deoghur fine but hot; rain wanted for high lands. In Nya Doomka high land paddy cut; low land improved. In Godda and Jantara rice suffering from want of rain.	
		Dacca ...	25	2·6	,,	Prospects of crops continue good. In Backergunge and Cachar rainy, crops favorable; in Mymensing fair, crops good; in Sylhet very hot, crops very favorable.	

No.	Presidency or Province.	District.	Date of District report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of Agricultural prospects.	Remarks of Local Government or Administration.
	Bengal, *continued* ...	Orissa ...	October 25 ...	·7	October 26 ...	Rain greatly wanted for high land crops. Rain fell on the 24th, and more expected. Increased demand for irrigation. Prices rising. In Pooree, dry and hot. Much injury apprehended from want of rain.	*General remarks.*—Rivers falling; crops improving.
		Presidency ...	„ 21 ...	...	„ ...	In Nuddea floods subsiding. Cattle dying of exhaustion. Cold weather crops being rapidly sown. In Jessore water subsiding; crops comparatively less damaged. In 24-Pergunnahs waters subsiding.	
		Patna ...	„ ...	...	„ ...	Weather fair, crops good. In Tirhoot waters fast subsiding; rice and cold weather crops good.	
		Rajshahye ...	„ 24 ...	...	„ ...	In Rajshahye waters subsiding; rice good where not inundated. In Bogra, Dinagepore, and Rungpore crops favorable. In Pubna rainy crops promising. In Maldah rivers have fallen considerably; crops improving: a good deal of sickness.	
5	N. W. Provinces ...	.....	„ 25 ...	*Nil.*	„ ...	Khureef as before. Ploughing and sowing for rubbee going on, and prospects, on the whole, fair.	
		Delhi	„ ...	*Nil.*	„ ...	Crops being cut. Rubbee sowings commenced. Rain wanted.	
		Umballa	„ ...	*Nil.*	„ ...	Rubbee sowings delayed for want of rain.	
		Jullundhur	„ ...	*Nil.*	„ ...	Want of rain interfering with rubbee sowings.	
		Lahore	„ ...	*Nil.*	„ ...	Rains much required for rubbee sowings. Baree Doab Canal stopped for some days, but now flowing. Inundation Canals not flowing. Sohag Canal ceased to flow about 9 days ago.	The continued absence of rain causes general anxiety regarding the rubbee sowings.
6	Punjab ...	Mooltan	„ ...	*Nil.*	„ ...	Agricultural prospects same as last reported.	
		Rawul Pindee ...	„ ...	*Nil.*	„ ...	Agricultural prospects good in northern tracts, bad in southern.	
		Peshawur	„ ...	*Nil.*	„ ...	Khureef out-turn expected to be three-fifths of an average one.	
7	Oudh ...	Lucknow ...	„ 26 ...	*Nil.*	„ 27 ...	.....	Regarding the Province generally, the Chief Commissioner reports that the weather has been clear and the ground has rapidly dried up. The khureef is being cut. The injury done by the floods is found to have been very great, but where the crops were not flooded the yield is good. The rubbee ploughings and sowings are being vigorously pushed on. The prospects of the rubbee are good, though, owing to the late and excessive rain and the distress in parts, there will not be so large an area under cultivation as there would otherwise have been.
		Fyzabad ...	„ ...	*Nil.*			
8	British Burmah ...	Rangoon	„ 25 ...	3·67	„ 26 ...	Crops favorable.	
		Moulmein	„ ...	6·75	„ ...	Very good.	
		Thayetmyoo ...	„ ...	1·33	...	Fair.	
		Tounghoo	„ ...	3·98	„ ...	Very good.	
9	Central Provinces ...	Raipore	„ 21 ...	*Nil*	„ ...	Khureef crops on high lands slightly affected. Rice and kodo on low lands need no more rain and are very healthy. Oilseeds promising. Rubbee sowings progressing favourably. Cattle disease in a few villages.	
		Bilaspur	„ ...	*Nil*	„ ...	Crops healthy and a bumper harvest expected.	
		Sumbulpur	„ ...	*Nil*	„ ...	Nearly half of the high land rice sowings will be lost. Low land crops secure. Oilseeds and pulse crops languishing. Sugarcane promises well.	
		Hoshungabad ...	„ 25 ...	*Nil*	„ ...	An average khureef harvest, or very slightly below the average, is expected. Rubbee is being sown under favorable circumstances. A little more rain in parts would improve prospects further.	
		Betul and Chindwara ...	„ ...	*Nil*	„		
		Nursingpur ...	„ ...	*Nil*	„ ...	Khureef, rice, kutkee, and kodo being harvested. Rubbee sowings progressing. Prospects good	
		Nimar ...	„ ...	*Nil*	„ ...	Rain wanted for rubbee sowings. Khureef crops excellent.	
		Jubbulpur ...	„ ...	*Nil*	„ ...	Khureef prospects excellent. Rice being harvested, and rubbee sowings commenced.	

No.	Presidency or Province.	District.	Date of District report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
		Damoh and Mundla	October 25	Wl.	October 26	Rubbee sowings well advanced. Teelee and gram sowings completed. Prices nearly stationary.	The last fortnight has been marked by no change. The weather has been seasonable, and, speaking generally, the harvest promises to be a full average one.
		Nagpur	" 26		"	Khureef crops in good condition. Wheat sowings commenced.	
	CENTRAL PROVINCES, —*continued.*	Wardah	"		"	Prospects of khureef crops excellent. Cotton prospects very fair.	
10	MYSORE	Bangalore	"	66	"	Crops continue healthy.	
		Mysore	" 24	282	"	Crops generally in good condition.	
		Coorg	" 26	409	"	Crops generally thriving.	
11	BERAR	East Berar	.....	Wl.	"	Autumnal crops on high soil suffering from want of rain. Sowing of spring crops commenced; these also require rain to bring them forward. Cotton crops in good condition.	
		West Berar	No report received.				
12	CENTRAL INDIA	Indore	October 25	Wl.	"	The prospects of the crops are, on the whole, favorable.	
		Gwalior					
		Rutlam					
		Neemuch					
		Myhere					
		Nagode					
		Sohawul					
		Serohi	" 21	"	"	Tanks dry; wells very low; khureef gathered; out-turn very indifferent.	
	RAJPOOTANA	Meywar	"	"	"	Rubbee prospects very poor.	
		Marwar	" 14	"	"	Water getting more scarce. Crops poor.	
		Deolee	"	"	"	Ditto ditto.	
		Kota	"	"	"	Crops cut; out-turn below average.	
		Jalawar	"	"	"	Rubbee crop operations commenced.	
		Ulwur	"	"	"	Tanks as usual. Crops gathered; out-turn above average. Rubbee prospects good.	
		Bhurtpore	" 25	Wl.	"	Crops fair.	
		Jeypore	"	"	"	Ditto.	
		Ajmere	"	"	"	Scarcity of water. No pasture or crops in lower Mhairwara. Famine works starting. People leaving their homes.	

GOVERNMENT OF INDIA.

FOREIGN DEPARTMENT.

Ladak Trade Returns for August 1871.

TABLE I.

Imports into Ladak during the month of August 1871.

Names of Goods.		In maunds of 80 pounds. Kooloo.	Rampoor.	Cashmere territory.	Chinese territory.	Toorkistan.	Total.	Rates per maund.	Value.	Remarks.
		M. S.	M. S.	M. S.	M. S.	M. S.	M. S.	Rs. A.	Rs.	
Bazzazee (English piece goods, cotton)	...	85 24	30 32	3 12	.....	...	119 28	175 0	10,927	
Course cotton cloth from Punjab	...	9 32	.....	.....	.....	...	9 32	87 8	860	
Sugar	...	127 3	12 20	5 16	.....	...	144 39	56 0	5,219	
Treacle	...	6 0	.....	.....	.....	...	6 0	20 0	120	
Spices	...	46 8	57 32	18 1	.....	...	122 1	40 0	4,881	
Tea	...	40 12	.....	1 8	26 16	...	66 36	150 0	10,183	
Indigo...	...	.....	1 8	.....	.....	...	1 8	160 0	192	
Maniâree (buttons, beads, &c.)	...	0 6	.....	0 3	.....	...	0 9	150 0	34	
Copper vessels	...	10 31	.....	.....	.....	...	10 31	80 0	862	
Iron vessels and horse shoes ...	...	3 24	.....	6 26	.....	...	10 10	40 0	410	
Rice	...	.....	.....	139 20	.....	...	139 20	5 0	698	
Dry apricots	...	.....	.....	9 22	.....	...	9 22	5 0	48	
Apricot kernels (for oil, &c.)	...	.....	.....	9 0	.....	...	9 0	8 0	72	
Butter	...	.....	.....	19 0	.....	...	19 0	20 0	380	
Opium	...	6 10	.....	.....	.....	...	6 10	480 0	3,000	
Tobacco	...	.....	.....	19 32	.....	...	19 32	20 0	396	
Halela (a drug) ...	...	18 0	.....	.....	.....	...	18 0	24 0	432	
Senna	...	.....	14 8	.....	.....	...	14 8	20 0	284	
Rhubarb	...	.....	.....	.....	.....	2 32	2 32	80 0	224	Left in the road from last year.
Hennah	...	.....	.....	0 20	.....	...	0 20	20 0	10	
Lac	...	.....	.....	0 4	.....	...	0 4	25 0	3	
Cash (English rupees)	...	.....	.....	0 6	.....	...	0 6	80 0	480	
			By	number.		...		Rate.		
Brocade (in piece)	... ...	62	.....	2	.....	...	64	100 0	6,400	
Broadcloth ...	... yards	.....	124	.....	.....	...	124	4 0	496	
Pushm { Baltee puttoos, coloured	pairs	.....	.....	2	.....	...	2	40 0	80	
Pushm { Shawl borders, hâshya	yards	.....	.....	150	.....	...	150	0 8	175	
Wool chadars, coloured ...	pieces	.....	.....	9	.....	...	9	5 0	45	
Embroidered dresses ...	...	.....	.....	1	.....	...	1	8 0	8	
Otter skins	...	259	102	4	.....	...	365	4 0	1,460	
Goat skins, dyed red, lâkee ...	scores	5	.....	15 8	.....	...	20 8	25 0	510	
Chagreen skins	...	.....	.....	62	.....	...	62	1 8	93	
Shoes, caps, &c.	...	.....	.....	619	.....	...	619	var.	583	
Paper, tablets, combs, &c. ...	...	.....	.....	172	.....	...	172	var.	232	
Shells for bracelets ...	...	1,371	125	.....	.....	...	1,496	2 0	2,992	
Plumes (Kulghee) ...	...	100	12	.....	.....	...	112	0 6	45	
Coral	tolas	60	.....	.....	.....	...	60	2 0	120	
China cups	...	.....	.....	125	.....	...	125	0 8	63	
Wooden cups	...	.....	1,500	.....	.....	...	1,800	0 3½	300	
Swords	...	.....	.....	27	.....	...	27	10 0	270	
Snuff	bottles	.....	.....	5	.....	...	5	2 0	10	
	TOTAL ...	.....	.....	.....	.....	...	.....	.....	53,597	

LEH—LADAK;
The 4th September 1871.

ROBERT B. SHAW,
Joint Commissioner on special duty.

TABLE II.

Exports from Ladak during the month of August 1871.

Names of Goods.	In maunds of 80 pounds.						Rates per maund.	Value	Remarks.
	Kooloo.	Rampoor.	Cashmere territory.	Chinese territory.	Toorkistan.	Total.			
	M. S.	M. S.	M. S.			M. S.	Rs. A.	Rs.	
Coarse cloth	.....	.....	9 32	.....	...	9 32	87 8	858	
Pushm (black)	.....	.....	2 32	.....	...	2 32	40 0	112	
" (white)	35 0	.....	36 16	.....	...	71 16	70 0	4,997	
Wool	20 0	.....	.....	.....	...	20 0	20 0	400	
Silk (raw)	1 0	.....	.....	.....	...	1 0	260 0	260	
Tea (Lhassa)	.....	.....	34 27	.....	...	34 27	150 0	5,200	
Copper vessels	.....	.....	9 23	.....	...	9 23	80 0	766	
Iron "	.....	.....	3 20	.....	...	3 20	40 0	140	
Churrus	69 16	27 16	15 16	.....	...	112 8	50 0	5,610	
Phoollee (carbonate of soda), ...	.....	.....	36 38	.....	...	36 38	1 4	46	
Borax	.....	.....	2 8	.....	...	2 8	23 0	51	
	...	By	number.				Rate.		
Carpets	10 0	.....	.....	.....	...	10 0	10 0	100	
Felts	30 0	49 0	82 0	.....	...	161 0	2 0	322	
Gold dust ... ... tolas	13 0	.....	.....	.....	...	13 0	14 0	182	
Total	.....	.....	.....	.....	...	.....	.....	19,044	

Leh—Ladak;
The 4th September 1871.

ROBERT B. SHAW,
Joint Commissioner on special duty.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

Satisfactory state of the works on the East Indian Railway after the recent floods in Bengal.

From Lieutenant-Colonel F. S. Taylor, R. E., Joint Secretary to the Government of Bengal, Public Works Department, Railway Branch, to the Secretary to the Government of India, Public Works Department,—No. 2063 G., dated Fort William, the 2nd October 1871.

In continuation of this Office letter No. 1763 G., dated 28th August last, I am directed to forward, for the information of the Government of India, copy of a note by Captain C. H. Luard, R. E., Deputy Consulting Engineer to the Government of Bengal, on his inspection of the East Indian Railway during the heavy floods up-country.

Note by Captain C. H. Luard, R. E., Deputy Consulting Engineer to the Government of Bengal, on his inspection of the East Indian Railway,—dated the 28th September 1871.

I accompanied the Chief Engineer on the inspection which he made during the heavy floods up-country.

His detailed report leaves little for me to add. I was not with Mr. Sibley during his inspection of the Allahabad works, but was with him everywhere else, and the soundings at the Jumna bridge at Delhi took place in his and my presence.

It is extremely satisfactory to find that all the works stand so well, and it may be reasonably hoped that there is very little chance of their being more severely tried during the present season. It is a subject for particular congratulation if the Company are put to no extraordinary expense during the present year, in which their receipts have so seriously decreased.

Mr. Sibley does not say much regarding the Cawnpore bridge, and it may be as well to state matters more in detail. The force of the flood produced such a strain upon the chains that they gave way, and 36 pontoons, with their girders and platforms, were carried down-stream. The pontoons were those nearest to the Cawnpore or right bank of the river, where the stream is strongest. The bridge consists of iron pontoons about 80 feet apart connected with [illegible] by means of chains attached to buoys anchored on the up-stream side. The pontoons are attached in sets of five to a buoy placed opposite to the centre pontoon, and connected by a chain with the outer pontoons of each set. Between each set there is an intermediate pontoon, so that each chain has to sustain the weight of six pontoons. It is not proposed to alter that part of the bridge which is uninjured; but in replacing the pontoons which have been carried away, the buoys will be placed opposite every fourth pontoon, and the connection will be made by a chain straight from the pontoon to the buoy instead of at an angle as before. It is also proposed to double the length of the anchor chain, so as to reduce the strain on it, and by these means it is anticipated that the bridge will be made sufficiently strong to resist the heaviest flood.

Memo. by E. Palmer, Esq., Chairman, Board of Agency, East Indian Railway,—No. 596 G, dated the 12th September 1871.

Copy of the following forwarded to the Consulting Engineer to the Government of Bengal for information.

From G. Sibley, Esq., Chief Engineer, East Indian Railway, to the Chairman, Board of Agency, E. I. Railway,—No. 1971, dated the 9th September 1871.

The floods produced by the late continuous and universal heavy rains having now so far subsided as to relieve us from any apprehension of further damage, I beg to report that our works have all stood well and that the traffic has been uninterrupted. The up line between Futwah and Patna was closed for a short time to traffic, to allow of its being given up entirely to the ballast train bringing material to protect the up line slope, but traffic was carried through on the down line.

On the 4th August Mr. Cummins reported that the Jumna at Delhi had risen to the height of eight inches above the maximum recorded (that of 1843), but that he thought that this was partly due to the Irrigation Department anicut recently erected at Okh, below Delhi.

On sounding on the 10th August it was found that the whole of the sand was scoured away, but the wells were sunk 12 feet into clay mixed with kunkur; rough rubble stone was thrown round the piers.

On the 11th Mr. Cummins telegraphed that the river had again risen and was then running at 12 to 13 feet per second. On the 12th it reached one foot above highest recorded flood.

On that evening I went up the line and reached Delhi on the morning of the 15th, having inspected the Cawnpore pontoon bridge on the way, respecting which I wrote in my No. 1867.

On the 15th, when I reached Delhi, the stream which had been running with its greatest force between piers Nos. 8 and 11 was then flowing more evenly over the bed.

The rapid current and subsequent fall was ascribed to the giving way of the anicut. A store of rough rubble was collected on the up-stream half of the piers, which it was arranged to throw in when the scour extended to more than 15 feet below lowest low water.

At Agra, where I arrived on the morning of the 16th August, I found that all cart traffic over the pontoon bridge had been stopped for several days, and that even foot passenger traffic was stopped, except as regards Europeans. The river had risen to 15 inches above the highest recorded flood, but was flowing very evenly over its whole width.

I arrived at Allahabad on the 17th August. On the 7th August the river had risen to 42½ half feet above low water level, being within 7 feet of the highest recorded flood. Soundings were afterwards carefully taken, and in only three piers was the scour more than 25 feet below low water level; that had been the level at which we had in previous years thrown in rough rubble round the piers; a supply of rubble was in hand, and it was being thrown in wherever the scour round the piers extended below our minimum.

The stream was flowing fairly through all the openings with a greater velocity through the middle half, that is, from 4th to 10th piers.

There had been no severe floods on the Jubbulpore line.

On the 2nd August there was a rise in the Saone of 21 feet, or slightly higher than the floods of 1864 and 1867, but this was rather due to the height of the Ganges at the time than to the volume of water passing down. I am informed by Mr. Levinge that flood did not at Dehree rise to within 1·20 feet of that of 1867.

On the 19th August, when I came down the line, the floods were out against the railway bank from Patna to beyond Luckeeserai, but though covering the country in many places to the extent of 10 feet, there was no dangerous rush through any of the openings, and there being no great amount of wind, there was no very heavy wash.

On the 22nd August Mr. Shervinton reported that the floods reached their maximum on the 21st, and a heavy wind having sprung up from the south, the waves cut to a considerable extent into the southern slopes of the bank between Futwah and Patna, but prompt measures were taken to bring down train loads of ballast and broken chairs and the slopes were protected.

On the 24th August Mr. Burr reported that the flood reached its highest on the 23rd, and the surface waves did some damage to the slopes; these were protected with ballast faggots, and jungle grass were thrown on the slopes to protect them. Where the jungle grass had itself grown densly, it formed the most perfect protection against the wash of the waves. Some of the paved slopes at the corners of bridges have slightly cut away; large rubble was thrown in as fast as the ballast trains could bring it. On the night of the 21st a portion of the Ganges bund was overtopped between 364 and 366 miles, and some rush through the opening between Barrh and 366 miles ensued.

On the 23rd August Mr. Heenan wrote that between Chumpa Nullah and Jumalpoor it had reached the highest recorded since 1856. On the 26th it reached 6 inches above the maximum of 1856.

Considerable damage was done to fence walls and to slopes of banks, but nothing to impede traffic, and no damage is done to any of the bridges; the greatest inconvenience has been, that the wire fencing having submerged, and the railway bank being the only ground out of water, the cattle have been swimming to it over the fence, and numbers have been run over by the loop line trains.

The flood has now fallen 2·6 feet.

From the Government of India, Public Works Department, to the Consulting Engineer to the Government of India for Guaranteed Railways, Calcutta,—No. 2062 R., dated Simla, the 16th October 1871.

Referring to the letter No. 2063 G. of the 2nd instant, from the Joint Secretary to the Government of Bengal in the Public Works Department, Railway Branch, I am directed to express the satisfaction with which the Governor General in Council has received the report therewith submitted of the efficient state of the works of the East Indian Railway, as evidenced by the manner in which they have withstood the recent heavy floods.

IRRIGATION OPERATIONS OF LOWER BENGAL UP TO 31st AUGUST 1871.

CIRCLE	CANAL.	Water supplied during 1871-72. Full supply depth.	Water supplied during 1871-72. Estimated full discharge in cubic feet per second.	Water supplied during 1871-72. Average depth throughout the month.	Water supplied during 1871-72. Average discharge in cubic feet per second through-out month.	Approximate area irrigated during August 1871-72. District.	Approximate area irrigated during August 1871-72. Area actually receiving water during the first time of column 8 maximum acres.	Approximate area irrigated during August 1871-72. Area actually receiving water for crops during current year.	Total of column 9 for all previous months of current year.	Total area irrigated up to date during the current year.	Rain-fall. Inches during the month.	Rain-fall. Inches up to date during the year 1871-72.	Average of ten preceding years for the same period.	Navigation Returns. Nature of traffic.	Navigation Returns. Number of boats.	Navigation Returns. Tonnage.	Navigation Returns. Ton-mileage.	Navigation Returns. Approximate value of goods.	Chief Irrigation. Per column 8.	Chief Irrigation. Per columns 8 & 9.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Orissa	High Level	6	675	4·6	..	302 Cuttack ..	7,457	731	6,676	7,457	6·93	35·66	40·83	Local Government ..	40	85	1,406	925	Rice ..	Rice ..	Escape 116 cubic feet per second.
															59	677	12,180	16,128			
	Kendrapara	7	1,262	4·80	704,131	.....	16,219	1,400	14,819	16,219	5·93	35·66	40·83	Local Through Government ..	56	440	11,240	7,032	Rice ..	Rice ..	Ditto 214 ditto ditto.
															114	1,082	45,444	..			
	Taldunda	8	1,300	6·75	75	.....	2,038	613	2,338	2,838	5·93	35·66	40·83	Local Government ..	16	119	4,484	445	Rice ..	Rice ..	* One day's irrigation.
															16	48	476	330			
						Total ..	26,744	2,803	29,774	26,877					174	4,312	44,307	4,132	Rice ..	Rice ..	
South-Western	Midnapoor*	8	875	2·25	100	Midnapoor ..	130	..	5,963	6,963	12·63	49·27	52·75	Local Government ..	2,557	11,266	93,154	542,107	Rice ..	Rice ..	† No irrigation.
	Panchkoorah	6	240	..	..	Howrah ..	..	..	..	..	12·70	50·45	Not available.		9	19	211	65			
						Total ..	..	..	..	..											
	Tidal Canal	..	..	..	..	Midnapoor ..	..	..	..	..	..	..	..	Local Government ..	1,023	6,031	156,806	125,210			
						Total ..	26,744	2,803	29,774	26,877					9	42	1,086	223			
	August 1870.																				
Orissa	High Level	..	..	..	..	Cuttack ..	22,035	21,655	380	23,035	10·01	27·84									
	Kendrapara	..	..	..	..	Ditto ..	40,000	38,000	2,356	38,356	10·01	27·84									
	Taldunda	..	..	..	..	Ditto ..	8,000	8,000	..	8,000	10·01	27·84									
South-Western	Midnapoor	..	..	..	..	Midnapoor ..	3,741	2,180	96,604	98,784	11·89	30·85									
	Panchkoorah	..	..	..	..	Howrah ..	500	292	298	800	13·76	39·05									
						Total ..	74,276	70,127	99,543	99,675											

T. M. KIRKWOOD,
Canal Revenue Superintendent, Bengal.

The 25th September 1871.

No. 42 of 1871.



SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, NOVEMBER 4, 1871.

OFFICIAL PAPERS.

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GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Thursday, the 12th October 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding*.
His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.
The Hon'ble John Strachey.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major-General the Hon'ble H. W. Norman, C. B.
The Hon'ble F. R. Cockerell.
The Hon'ble R. E. Egerton.
His Highness Sarámade Rájáhác Hindústán Ráj Rájendra Srí Mahárájá Dhiráj Sivái Rám Sing Bahádúr, of Jaypúr, G. C. S. I.

CRIMINAL TRIBES' BILL.

The Hon'ble MR. STEPHEN moved that the report of the Select Committee on the Bill for the registration of Criminal Tribes and Eunuchs be taken into consideration. He said that the Bill had been for some time

before the Council, having been introduced as long as a year ago, and that, as its provisions affected only the northern States of India, there appeared to be no objection to passing it in the Panjáb, one of the provinces principally concerned, and the chief officers of which were members of the Council. The Bill had been considered with great attention, and it had in its present form substantially received the approbation of the various Local Governments to which it had been submitted. The Bill had several objects in view. It was unnecessary to dwell again on the unfortunate state of things at which it was levelled. In dealing with the matter the Committee had been alive to the fact that, in any measure of the sort, it was difficult not to confound the innocent with the guilty, and to avoid entrusting to unfit depositaries of power the means of exercising oppression. Still the object in view rendered it worthwhile to run some risk. He might give the Council one or two instances which would explain the nature of the evil and the absolute necessity for legislation. A report had been received early in 1870, from the Superintendent of Operations for the Suppression of Thuggee and Dacoity, as to the habits and proceedings of one of the principal of the criminal tribes—the Meenas at Shajanpúr—from which he would, with the permission of the Council, read one or two extracts:—

"It is a fact that Shajanpúr is inhabited almost exclusively by Meena plunderers. As many as five hundred adult Meenas have habitation there, and distant robbery is notoriously their profession and their livelihood. Their houses are built of substantial masonry, some with upper stories to them and with underground passages; fine wells have been constructed at their own expense; the land they cultivate, and for which they duly pay revenue, yields no more than would be sufficient for a fourth part only of the population,—men, women, and children combined,—which the number of their adult males represents; they maintain fleet camels, some of which may be found secreted in their premises in readiness for an expedition, or but now arrived from some unknown raid. Cows, buffaloes and goats are among their possessions; they live amid abundance, and they want for nothing; their festivals of marriage and other ceremony, whether of joy or solemnity, are attended with lavish expenditure. Flesh is their food, and liquor their potation. Trinkets of gold and silver and fine dresses adorn, on pleasure days, the persons of their females. Gold and coral necklaces, earrings and good turbans, are the display of the men; bracelets and frontlets studded with various coins, the ornaments, and party-coloured garments the apparel, of their children. Music and every requirement without stint form the accompaniments of their feasts; revelling and quarrel mark their termination: plenty they have, plenty they spend, and plenty they bestow, and there is no end to their charity."

Another officer describes their villages thus by way of explaining the desperate and successful resistance which they were enabled to offer to the police who wished, on a particular occasion, to arrest a criminal:—

"The Meena quarters of Shajanpúr is divided into plots, and round each of these is a thorn hedge, some twelve feet high, piled up purposely to prevent passers-by from observing what is going on inside. Every plot contains some twenty or thirty houses, and round each of these again is a thorn hedge, with openings here and there to enable the inmates to escape into the adjoining premises in case search is being made for them."

A case which occurred at Ajmere showed the nature of the operations of these men and the impossibility of dealing with them satisfactorily under the present law. The Superintendent said:—

"Three gangs of Meenas, numbering in all fifty-seven men, were detected simultaneously quartered in different parts of that city with the connivance of certain members of the local police and of some chaprásis on the establishment of the Magistrate of the district according to the following account as furnished in the Dacoity Statements for British districts submitted by me in the Home Department:—'A large number of Meenas was arrested at Ajmere by the local police in December of the year, the most of whom were convicted by the Deputy Commissioners of "unlawful assembly." They were examined soon after by the approvers of the Thuggee and Dacoity Department. At that time only a few of them were recognized, *the operations against the Meena tribe being then but new, and no more than two approvers as yet admitted;* but several of them have since been registered as dacoits. The men who composed these gangs were, at the time of their arrest, on an expedition of dacoity lower down the country. They had come down from Shajanpúr in the British district of Goorgaon near Delhi, and from the Ulwur and Jaypúr States, and had stopt at Ajmere for want of funds, intending to commit dacoity there by which to recruit them. They had already committed two dacoities in contiguous territory (the plunder in those robberies, Mr. Stephen observed, was valued at Rs. 24,000), and had marked down the house of a mahájan in the city of Ajmere which they would next have plundered but for their opportune arrest by the district police.'

"The Deputy Commissioner of the district sentenced the whole of these men to rigorous imprisonment for seven years, and they had been transferred to the Agra Jail to undergo that punishment, when the case was reviewed by the High Court at Agra upon petitions presented by three men of the local police force who had been convicted of aiding and abetting them. The Judges recommended the remission of the sentences of the entire number on the ground of wrongful imprisonment without any legal or sufficient evidence of guilt, which, after some further local enquiry, was complied with by the Government of the North-Western Provinces. Owing to our having then only recently taken up operations against the Meenas, and to the acquaintance with Shajanpúr Meenas on the part of our two only approvers being very limited, the evidence which this Department was able to produce against these persons was of little moment, further than that all or nearly all of the arrested parties were declared to be *Meenas*, and that several of them were *Meenas of Shajanpúr*. But the Police Constable who conducted the Meena roll-calls and the Lambardár of Shajanpúr, were able to claim several of them as residents of that place, of whom they pointed out *five* to be Meena leaders, and three of these (Gara, Sadasookh and Sheolall) have since become known to us as important leaders, against whom several dacoities have been registered by members of the tribe since admitted as approvers.

"The Judges observed that the then recent *Fenian trials* in Ireland, held before a commission of three Judges, afforded examples of the course which ought to have been pursued in the present case, in which a large number of persons were similarly simultaneously charged with the same offence. The charge upon which the present prisoners were arraigned was *assembling and making preparation to commit dacoity*, and the Deputy Commissioner of Ajmere, who tried the case, considered that charge to have been fairly substantiated against them. But the Judges, on the ground that it had not been satisfactorily shown that all were *Meenas* (this fact Mr. Stephen observed was afterwards, according to the Superintendent, satisfactorily proved), and that it was not a crime to be a Meena, nor a proof of a crime, held that the mere fact of their being congregated in Ajmere and having some of them swords and others sticks, or a few camels and horses, was not sufficient for their conviction under the particular laws under which they and their abettors had been tried. By *making preparation* they considered that the Indian Penal Code intended something more than the mere *assemblage* of persons for the purpose of committing dacoity, and that proof was necessary of some *arming* or *equipment* for the special purpose of committing dacoity, or some other act besides *the mere assembling*, having as its object the perpetration of dacoity, of which, in their opinion, there was no evidence, or that the different parties of Meenas had any common felonious object in assembling. [illegible] would have disposed me to reply to these observations that dacoits certainly *assemble* preparatory to committing dacoity; that, to preserve secrecy, they naturally conceal their weapons near the scene of the intended crime, or put them away somewhere they might be readily found; and that they are generally only *armed* when actually perpetrating the offence. And, further, that the fact of these men secreting themselves in different parts of a city *at so great a distance from their homes*, unable, when discovered, to give any satisfactory account of themselves, those who were recognized being ascertained to have changed their names, their castes and their places of residence, was of itself a fair proof of no *good* intention; and that, considered with the circumstance that it was well known that Meenas were habitual dacoits, *their being away from their homes in a body*, was a reasonable-enough proof of *felonious* intent when taken with the other circumstances under which they were detected."

Such was the state of things with which the Legislature had to deal—armed parties of criminals living in fortified villages, going about systematically to commit acts of violence. Could there be a doubt that Government was absolutely bound to deal expressly with such a case?

How then were they to deal with it? It was the rule of the Legislative Department not to initiate measures of general administration,—and the department had not done so, and did not intend to do so, in the present instance; but this report and other authorities, to which he (Mr. Stephen) had referred when the Bill was introduced, had called their attention to the fact that a great evil existed, and that the law was not only too weak to cope with it, but had actually put a stop to the measures, weak, though beneficial, as far as they went, which the Executive Government had devised for its suppression. Both in the Panjáb, Oudh and the North-Western Provinces, systems of registration and roll-call had been adopted; but, as the executive officers had no power to punish those who broke the rules imposed on them, and as the Courts, at least in

the Panjáb, expressly declared such rules to be illegal, they broke down entirely, and the persons restrained by them were left at full liberty to pursue their habits of systematic criminality, and the result had been, as affirmed by the Local Government, a most serious and alarming increase of crime. It was easy enough to understand the feelings of bitterness which such mishaps occasioned on the part of executive officers zealous for the discovery and repression of crime towards the legal tribunals, who, in the discharge of their duties, pronounced the only means for effectually dealing with criminals to be illegal. Those feelings were an illustration of a general tendency of which he (MR. STEPHEN) had noticed many forms in India, the existence of which appeared to him to be very unfortunate. He referred to a tendency on the part of the executive officers, in whom the actual government of the country was vested, to dislike and suspect law and lawyers, as if there were something in the very nature of law by which executive vigour was rendered impossible. This was a great mistake. If the existing law was ill fitted for the state of society, in which it existed, it ought to be altered. There was nothing in law as such to prevent executive officers from acting with whatever degree of vigour might be required by the general interests of the community. Indeed, nothing could possibly be more conducive to executive vigour than a distinct system of laws defining, in the clearest possible terms, the powers with which executive officers were to be invested. Such a system would be to the executive officer what precise orders would be to a soldier on active service. He would know where he was, and be free from doubt as to the legality of his conduct,—a doubt which might well paralyze the most vigorous. He (MR. STEPHEN) did not think that the Courts were to blame for the views which they were apt to take upon such subjects. No doubt they decided, according to their conscientious belief, as to what the existing law actually was, and this was, of course, their duty. The Legislature, if any one, was in fault. It was undoubtedly their duty to keep a careful watch upon the course of administration, and to give expressly to their officers, from time to time, such powers as were necessary for good government. The task, however, was one of the greatest difficulty and delicacy, and was also one in which rashness might be disastrous. The present Bill was an attempt to discharge it, in regard to this particular matter.

He would now shortly describe a few of the leading provisions of the Bill which had been settled with the greatest care in concert with the Local Governments of the provinces to which it extended. The Bill was divided into two parts,—one referring to criminal tribes, and the other to eunuchs. The part which related to criminal tribes had been very considerably altered since the introduction of the measure, in order to meet the views of the Local Governments. He (MR. STEPHEN) had originally proposed to confine the measure to tribes who had fixed places of residence during at least part of the year. The reason of this was that it appeared exceedingly difficult to deal with tribes which had no place of residence, but perpetually wandered. To prevent them from wandering might, in many cases, be equivalent to preventing them from earning their living; and it did not follow that, because a tribe of basket-makers or grain-sellers might occasionally, or even frequently, commit thefts, they were to be treated as a criminal class, who travelled about for the purpose of committing crime, and made their ostensible occupation a mere pretence for the purpose of enabling them to do so with more convenience. The tribes who were chiefly in the mind of the framers of the Bill when it was introduced, were persons like the Meenas, of whose habits the (MR. STEPHEN) had already given a description. The Local Governments had however, represented to the Committee that wandering gangs of criminals were both common and dangerous, and that few, if any, criminal tribes were of greater importance, or more urgently required the discipline which this Bill would provide for them. The Bill had accordingly been so moulded as to apply to all criminal tribes, whether they had or had not a fixed place of residence. Careful precautions had, however, been taken to prevent, as far as possible, any abuse of the very extensive powers which the Bill conferred. The second, third and

fourth sections of the Bill provided in substance that, before a gang, tribe or class could be declared criminal, the Local Government should report the case to the Governor General in Council, detailing in their report their reasons for regarding the tribe as criminal, the nature of the crimes which it was suspected of committing, and if it was a wandering tribe, the reasons for supposing that any lawful occupation followed by it was a mere pretence for the purpose of facilitating the commission of crime. The report was also to set out the arrangements proposed to be made for enabling the tribe, when settled in any fixed place of residence, to earn its living therein. This report would not be liable to be enquired into by any Court of Justice, but it would remain amongst the records of Government, and might be produced at any time if oppression were found to result, so as to fix the responsibility of procuring a tribe to be declared criminal on those to whom it might properly belong.

If, on the consideration of the report, the Governor General in Council thought fit, he might authorize the tribe to be declared criminal. Thereupon, a register of its members would be formed under the orders of the Local Government, according to a procedure laid down in the Bill. Persons aggrieved by an entry therein would have an appeal to the Magistrate of the district, and his order might be reviewed by the Commissioner. If the tribe had no fixed place of residence, it could not be registered until the Local Government had made arrangements which the Governor General in Council considered suitable for enabling it to earn its living in the place in which it was to be settled, and no tribe, whether wandering or not, once settled in a fixed place of residence, could be removed to another, except upon similar conditions. Parts of tribes might be separately dealt with, so that their organization might be broken up, and the young instructed in better modes of life than their parents.

Criminal tribes, when registered, might be placed in either of two categories, according as the settlement in which they were placed was or was not declared to be a reformatory. If the settlement was not declared to be a reformatory, the registered persons would simply be placed under a strict system of roll-call and passes. If the settlement was declared to be a reformatory, their labour would be superintended and regulated, care being taken that its surplus produce, after providing for their maintenance, should be applied for their benefit. Any registered person who was found in any part of British India might be arrested and returned to the appointed place of residence, and violation of the rules for the regulation of such places or of reformatories was punishable by fine, imprisonment and whipping. The duty imposed on village headmen and watchmen by the Bengal Regulations, to give notice of offences, was re-imposed in this Act, with regard to reporting the movements of registered persons. One part of the section empowering the Local Government to make rules, deserved special notice. It enabled them to make rules as to the inspection of the residences and villages of registered tribes, "and the prevention and removal of contrivances for enabling the residents therein to conceal stolen property, or to leave their place of residence without leave." The object of this was to prevent persons, like the Meenas, from evading the whole object of the Act by thorn hedges, underground passages, and the like.

The result of the whole of these provisions, taken together, would be to enable the Local Governments effectually to coerce and restrain from crime such communities as had been noticed.

The second part of the Bill—that relating to eunuchs—had been but little altered, and the revolting nature of the subject rendered him (MR. STEPHEN) most unwilling to say more about it than was absolutely necessary. He had, in his former speech upon the subject, stated the grounds on which the proposed measure rested. He had seen no reason to change the opinion which he then expressed, and the Local Governments consulted on the matter concurred in his views.

His Excellency the COMMANDER-IN-CHIEF said that it was impossible to listen to the interesting statement which had been made by the Hon'ble Mr. Stephen regarding this measure without much satisfaction,—a measure which, though apparently one of executive severity, it was really calculated to be of great benefit to large classes of the people of India who, though in a certain sense criminal, were yet wanting in one element of criminality, inasmuch as they were unconscious of the nature of their acts, having been educated to consider them as innocent, and trained from their earliest youth for the purposes of crime. Another advantage of such measures as the present was that they were a step in the direction of knowing what the people subject to our government were doing,—a branch of knowledge in which the Government had hitherto made very little advance. On the whole His Excellency would express his entire satisfaction with the manner in which the subject had been treated by the Legislature.

The Hon'ble MR. EGERTON wished to add a few words to the remarks of his hon'ble friend Mr. Stephen on a subject which he (MR. EGERTON) considered as especially interesting and important. Most of the provisions of the Bill dealt with the case of adults, but there was one section which enabled the Local Governments to remove any part of a criminal tribe and to locate it in a reformatory settlement, and he earnestly hoped that this provision might be enforced for the purpose of establishing reformatories for the youths of criminal tribes, who were at present trained from their earliest years in habits of theft and violence. No one who had had to do with the police execution of a district could fail to know how deeply inbred in certain classes of the population these lawless habits were, and how impossible it was for a child, so unfortunately circumstanced, to break away from the traditional habits of the community in which it was born. These children were brought up to look upon theft as an honourable duty, and as a matter of daily occurrence. The Sonorias, for instance, were a wandering tribe, of which the children were systematically trained for, and employed in, practices of theft. The skill and intelligence of the children were very remarkable, and it was a pity that they should not be utilized for right and useful purposes instead of being directed to mischievous and depraved ends. If the State exercised a wholesome severity on the one hand, it was only right that, on the other, it should extend the opportunity of improvements to every class of its subjects. MR. EGERTON approved also of the measures by which village headmen and watchmen were made, to a certain extent, responsible for the maintenance of public order. He knew by experience what valuable aid they could give in the discovery and repression of crime, and how successfully they could baffle the proceedings of the police, if they chose. It was a wise policy to put their responsibility in this important particular on a legal footing.

The Motion was put and agreed to.

The Hon'ble Mr. Stephen also moved that the Bill as amended be passed.

The Motion was put and agreed to.

EXTRADITION BILL.

The Hon'ble MR. STEPHEN, in moving for leave to introduce a Bill to consolidate and amend the law relating to offences committed in foreign States, said that the object of the Bill was to consolidate the existing laws on the subject, and to amend them in several important particulars, in which they were at present defective, as well as to give the express warrant of law to certain executive measures which had been taken in connection with the subject. Considerable dissatisfaction had been occasioned to Native allied Princes by these deficiencies of the law, which it was now intended to remedy. The Bill involved several questions of a delicate and difficult nature, which he would defer touching upon till the Bill was introduced.

The Motion was put and agreed to.

EUROPEAN VAGRANCY ACT AMENDMENT BILL.

The Hon'ble MR. STEPHEN presented the report of the Select Committee on the Bill to amend the European Vagrancy Act, 1869.

NORTHERN INDIA CANAL AND DRAINAGE BILL.

The Hon'ble MR. EGERTON presented the report of the Select Committee on the Bill to regulate the construction and maintenance of Public Works for Irrigation, Navigation and Drainage.

The Hon'ble MR. COCKERELL, having obtained the permission of His Excellency the President to make a few observations in regard to the presentation of the report, said:—"My Lord,—I do not wish to raise any discussion on the merits of the Bill to which this report relates, as it is not now before the Council. My object in asking leave to say a few words on the present occasion, is simply to deprecate the apparent intention of proceeding to the consideration of this report and the passing of the Bill, which the presentation of the report at this time seems to indicate, whilst the Council holds its sittings at Simla, and to express the hope that that intention will not be persevered in.

"I am not unmindful of the fact that a change of title and the proposed restriction of its immediate local extent, have given to the Bill the external appearance of a purely local measure. I do not forget the presence in the Council, during its sittings at this place, of the head of the Panjáb Government and the chief revenue officer of that province, nor do I presume to underrate the very great and peculiar advantages which the consideration of a measure of this kind must necessarily derive from their presence. I anticipate and admit all that can be said by the advocates of no further delay in this matter in favour of prosecuting to completion the enactment of this Bill ere the Council adjourns. But, nevertheless, I venture to express a very decided opinion that the attempted assertion of the principles which govern some of the most important provisions of this Bill is calculated to give an effect to the measure which must reach far beyond its nominal local extent, and thus take the Bill altogether out of the category of mere local enactments; and I say that, whether regard be had to that effect, or to the circumstances under which the Bill was originally introduced, and the loud protests and expressions of disapprobation which the enunciation of those principles then drew forth from many eminent public officers, it will be unwise and impolitic to press on the enactment of such a measure at a time and place where the only semblance of the representative element which this Council possesses, I mean the presence of those non-official members who as British subjects are amenable to the laws which they aid in enacting, is necessarily wanting.

"My Lord, if I stood alone in the strong objection which I entertain to the principles which it is proposed to affirm by the enactment of this Bill, I should feel great hesitation in urging my present point against what I believe to be the views of the majority of my colleagues. But when the strongest opposition to the assertion of those principles has been repeatedly expressed in what I conceive to be unanswerable language by the ablest and most experienced revenue officer in India—the Lieutenant-Governor of the North-Western Provinces; when I know that the same strong objection was felt by at least two of our colleagues, now absent, who took a most active part in the consideration and discussion of some of the details of the Bill during its early progress in committee at Calcutta—gentlemen whose long standing in the public service, varied experience, and especial familiarity with the working of canal irrigation,—the blessings which, when wisely regulated, it can confer on the people, and the no less certain evils which an inefficient or indiscreet management of it carries in its train,—necessarily entitle their opinions to mature consideration; under such circumstances, I do feel justified,

my Lord, in appealing to Your Excellency and the members of Your Excellency's Government as strongly and earnestly as I can, to allow the further progress of this measure to be stayed until the Council meets in Calcutta.

"If the imposition of such altogether novel and peculiar taxation as is aimed at by this Bill is to be allowed by an enactment of the Legislature, then, my Lord, I submit that it should be done with all the emphasis and appearance of deliberation that a full assembly of the members of Your Excellency's Council for making Laws and Regulations in the capital of the empire, and specially the presence in that assembly of that important constituent part of the Council to which I have just referred, can give to the proceeding.

"It is just three years since, in this place, I made a similar appeal to Your Excellency's predecessor to defer, under like circumstances, the adoption of that curious piece of legislation—the Panjáb Tenancy Act. And I believe that I am justified in saying that much of the dissatisfaction with which that enactment was received by the public, was undoubtedly due to the manner in which it was hurried through the Council, and to the fact of its having been passed at Simla."

The Hon'ble MR. STRACHEY said that his hon'ble friend's observations appeared to him very irregular, and certainly had not carried out his promise of not raising a discussion. The fact was that the question raised by Mr. Cockerell was nothing short of this—should or should not the Bill be taken into consideration at Simla? It was impossible to go into this question without discussing the whole policy of the Bill, which he (MR. STRACHEY) had no intention of doing. With regard to Mr. Cockerell's somewhat sensational appeal to the public, he would state what the plain truth of the case was. Some years ago the Panjáb Government had come to the Government of India for a Canal Bill, which it was said was urgently needed. It was then proposed to extend the measure to the whole of Upper India. Afterwards difficulties, which he (MR. STRACHEY) on a recent occasion explained to the Council, had arisen in doing this, and it was accordingly determined to revert to the original plan and legislate for the Panjáb alone. So far from the Government of India having had any special desire to adopt this course, it was, as he was sure the Lieutenant-Governor would testify, the earnest wish of the Panjáb Government for this Bill, that had led to its being now proceeded with; and as the Bill was now a strictly local one, and as the Lieutenant-Governor, the Financial Commissioner, and other officers of local experience were present to assist the deliberations of the Council on the subject, it seemed to him only a natural and proper course to proceed with it while the Council was sitting in the Panjáb—at Simla—rather than at Calcutta, when all these advantages would be wanting.

His Excellency the PRESIDENT said:—"Before this Bill is taken into consideration at its next stage, the observations of the Hon'ble Mr. Cockerell will receive the attention of the Government. But I must at once take exception to a view which is suggested by the hon'ble member's remarks, and which ought not to pass unnoticed,—the view that certain measures cannot be discussed and disposed of by this Council with equal and even more advantage at Simla than at Calcutta. The Bill before us is one which affects the Panjáb, and the Panjáb alone; the necessity for it is strongly urged upon the Government by all the local authorities. Members of this Council, who are also members of the Panjáb Government, and therefore most competent to advise upon the subject, are present; these gentlemen cannot, from the nature of their official duties, attend at Calcutta. It appears to me, therefore, that the present is the most fitting time, and Simla the most fitting place for discussing this measure.

"It is not fair to assume that measures which are considered fit for the Panjáb must necessarily, in consequence, be considered suitable in all their details for every other part of the empire. Canal Bills, for other provinces, will

be discussed and settled on their own merits, with reference to the wants of the particular case and to the opinions of the local authorities. As a matter of principle, the Government has long since declared its opinion in favour of a compulsory rate to be levied under fixed conditions and certain well-defined limitations. I believe the principle asserted by the sections forty-four, &c., to be not only sound and useful, but absolutely essential to the success of those great schemes of irrigation by which alone large portions of the country can be preserved from periodical famines, and the country permanently enriched; but, because the Council adopts that opinion and applies these clauses to the Panjáb, it does not necessarily follow that all the details now provided will be necessarily applied in future legislation to other parts of India. Such an assumption is without foundation. This sound principle may be applied in other forms and by other means.

"With regard to this particular Bill, looking to the history of past attempts at legislation on the subject,—to the absolute necessity which exists for legislation of some sort, to the advantage the Council enjoys in the presence of officials of experience and authority connected with the administration of this province,—I think that the Government have adopted a wise course in dealing with the Bill here and in declining to run the risk of another year's delay, simply because gentlemen connected with other parts of the country, and who have no particular and special knowledge of the Panjáb, do not happen to approve a measure which the officials best acquainted with this province regard with approval and satisfaction. I repeat that this Bill is not to be taken as laying down an absolute and unalterable formula for the whole of India, but is to be considered on its own merits as affecting the Panjáb; and it seems to me that the Panjáb is the place in which such a measure can be best disposed of."

The Hon'ble MR. ELLIS suggested that the proper course would have been for the Hon'ble Mr. Cockerell, if he objected to the pass[illegible] of the Bill at Simla, to wait till the motion for taking the Bill into cons[illegible]nade, and then to move as an amendment that the consideration o[illegible]e deferred till the return of the Council to Calcutta. At present there was no motion before the Council, and the hon'ble member was therefore out of order in remarking on the Bill.

The Council adjourned to Thursday, the 19th October 1871.

H. S. CUNNINGHAM,

SIMLA,
The 12th October 1871.

Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Thursday, the 19th October 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding.*

His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.

The Hon'ble John Strachey.

The Hon'ble Sir Richard Temple, K. C. S. I.

The Hon'ble J. Fitzjames Stephen, Q. C.

The Hon'ble B. H. Ellis.

Major-General the Hon'ble H. W. Norman, C. B.

The Hon'ble F. R. Cockerell.

The Hon'ble R. E. Egerton.

His Highness Sarámade Rájáhée Hindústán Ráj Rájendra Srí Mahárájá Dhiráj Sivái Rám Sing Bahádúr, of Jaypúr, G. C. S. I.

EUROPEAN VAGRANCY ACT AMENDMENT BILL.

The Hon'ble MR. STEPHEN moved that the report of the Select Committee on the Bill to amend the European Vagrancy Act, 1869, be taken into consideration. He said that the Council was aware that the object of the Bill was to deal with the case of grooms arriving in this country from Australia in charge of horses and becoming chargeable to the State as vagrants. The European Vagrancy Act, as [illegible] expounded, did not fully meet the case, and the section now added would, it was hoped, make evasion of the law impossible. Some valuable suggestions had been received from the Advocate General as to the ingenious modes in which the legal obligations imposed by the Act could be shirked; and, in accordance with his advice, definitions had been inserted in the Bill, the effect of which would be that the responsibility in every case should be brought home to some one or other.

The Motion was put and agreed to.

The Hon'ble Mr. Stephen also moved that the Bill as amended be passed.

The Motion was put and agreed to.

INDIAN WEIGHTS AND MEASURES OF CAPACITY BILL.

The Hon'ble Mr. STEPHEN presented the report of the Select Committee on the Bill to regulate the Weights and Measures of Capacity of British India.

LAND-REVENUE PROCEDURE (PANJÁB) BILL.

The Hon'ble MR. STEPHEN also presented the report of the Select Committee on the Bill for consolidating and amending the law as to land-revenue procedure in the Panjáb.

BENGAL REGULATIONS REPEAL BILL.

The Hon'ble MR. COCKERELL moved that the report of the Select Committee on the Bill for repealing certain enactments of the Bengal Code be taken into consideration. He said that he did not think that he should be

justified in taking up the time of the Council with any lengthened explanation of the details of a measure of this kind.

The propriety and expediency of the repeal of an enactment on the ground that it had become obsolete, or that its retention in the present state of things was unnecessary, could only be determined after a thorough investigation of its contents. Hence it followed that the Council, when asked to accept the conclusions of this report, had necessarily to take much upon trust, and thus a more than ordinary responsibility rested upon the Select Committee in dealing with the subject of the present Bill.

In this view of the matter the proposed repeals had been weighed with extreme care and deliberation, and he (MR. COCKERELL) could affirm with that confidence which a long study of the subject of the Bengal Regulations in some measure enabled him to express, that the proposals contained in the Bill, as amended, erred rather on the side of over-caution.

The plan of the original Bill comprehended the complete expurgation of all obsolete or unnecessary matter from the Bengal Regulations, and for this purpose two schedules were framed,—the one providing for the entire repeal of the surviving or previously unrepealed provisions of wholly obsolete Regulations, the other comprising the repeal only of obsolete parts of Regulations.

The object of this measure was of course to simplify by reducing to the smallest possible compass the operative law contained in the Regulation Code.

In the opinion of some of the local authorities the difficulties attending the ascertainment of that law would be rather increased than diminished by the repeal of mere fragments of Regulations. Without assenting to this view they proposed to omit the schedule of partial repeals, and this course had been more readily adopted in consideration of the prospect which they now had of an early consolidation of most of the surviving Regulations.

The Regulations which would remain on the Statute-book after the passing of this Bill, and a cotemporary measure which provided for several further repeals, related for the most part to the assessment and collection of land-revenue, and the codification of the [illegible] law on this subject had been greatly simplified by the experience gained through the progress already attained in the framing of a similar Act for the Panjáb. For it had been clearly demonstrated that the operative substance of the numerous bulky and complicated enactments which represented the existing law on this subject, was capable of being reduced to a single Act of extremely moderate dimensions, and this without the sacrifice of anything which it would be desirable to retain.

After the completion of the process of consolidation of such of the Regulations relating to land-revenue, police and other subjects as were susceptible of being re-enacted in a more concise form, there would remain only a list of from thirty to forty Regulations of most of which the practical value was rather that of an historical record of rights and privileges conceded by former legislation than of a constituent part of the existing operative law.

MR. COCKERELL had only to add that he thought some acknowledgment on the part of the Committee was due to Mr. Field of the Lower Bengal Civil Service for his valuable criticisms on the subject of this Bill. A full investigation and review of the schedules of the original Bill involved, no doubt, a degree of labour which experienced officers with their many and more pressing duties had been unable to give to this matter; and, speaking generally, the assistance given by the local authorities to the determination of the proposed repeals, had been somewhat meagre. Mr. Field's paper on the subject forms a marked exception to this general absence of co-operation. Having been engaged for a long time in the compilation of a new edition of the extant Bengal Regulations,—a work which, if there was no early prospect of consolidating what remained of those enactments, would be very much needed,—he had

necessarily acquired that familiarity with the subject which rendered his paper of very great value in the settlement of the contents of the schedule.

The Motion was put and agreed to.

The Hon'ble Mr. Cockerell also moved that the Bill as amended be passed.

The Motion was put and agreed to.

INDIAN CHRISTIAN MARRIAGE BILL.

The Hon'ble MR. COCKERELL introduced the Bill to consolidate and amend the law relating to the solemnization in India of marriages of persons professing the Christian religion. He said that he might remind the Council that this was one of the several consolidation measures for the introduction of which leave was obtained about a year ago.

The delay in the preparation and introduction of the Bill had been due mainly to the great pressure of business in the Legislative Department during the last year.

The Bill provided for the collation into one enactment of the provisions of the Statute 14 & 15 Vic., cap. 40, and the Indian Acts V of 1852 and V of 1865, with such alterations of wording and arrangement as were incidental to the process of consolidation. It further comprised three substantial amendments of the existing law.

At the present time, only Act V of 1852 extended to the territories of Native Princes in alliance with Her Majesty, and he (MR. COCKERELL) apprehended that there was great doubt as to the validity of a marriage solemnized between the Christian subjects of Her Majesty in Native States otherwise than in the presence of a Marriage Registrar appointed under that Act, even if the marriage was solemnized by an ordained clergyman of any of the established churches, and in conformity with the ceremonies and customs of such churches.

The Bill would remove this doubt by extending the entire law relating to Christian marriages to Native States in alliance with Her Majesty.

There was also some ambiguity in the provisions of the existing law as to the submission of returns of marriages solemnized between Native Christians. For statistical purposes the Indian Government was required to transmit to England the returns of marriages solemnized between British subjects who, though resident in this country, retained their English domicile; and, to meet this requirement, the law obliged persons registering Christian marriages to submit with regularity the returns of such registrations.

The wording and arrangement of the provisions of the existing law relative to this obligation, did not clearly indicate its intended extent. There had been from time to time, since the passing of the Act of 1865, various references to the Local Governments on the subject, and the orders passed thereon did not evince a uniform interpretation of the requirements of the law on the part of the executive.

The Bill laid down clearly the rule that the returns of marriages between Native Christians howsoever they might have been solemnized, were not required.

The most important amendment proposed in this Bill was in regard to marriages between Native Christians, either of whom was a minor. The framers of the present law, actuated by the desire of making the forms of marriage between Native Christians of the poorer and uneducated classes as simple and inexpensive as possible, dispensed with all notices, and required only that the persons intending marriage should be of a certain specified age,—which, in

the case of both male and female, was considerably below that which constituted majority even amongst the natives of this country,—and that they should not stand in relation to each other within the prohibited degrees of consanguinity and affinity—apparently as prescribed by the English Canon, though this is not specified.

The practical effect of this was to deprive Native Christian parents of that controul over the action of their children in the very important matter of contracting marriages which the law or custom gave to parents of all countries and creeds. He ventured to think that this result of the enactment of Part V of Act V of 1865, must have been overlooked, and he should say that he entirely sympathized with the Reverend Kristo Mohun Bannerjee and several other leading gentlemen of the Native Christian community who had memorialized His Excellency on the subject, pointing out the extreme hardship inflicted on them by the legislation referred to.

He (MR. COCKERELL) thought that they had a substantial grievance, and were entitled to a remedy. Whether the proviso to section fifty-four of the Bill gave the required relief in the best form that could be desired, he was not prepared to say. The provision had been inserted tentatively, and might be found to need much alteration when the Bill went before a Select Committee. It was intended to restore the power of controul of which Native Christian parents had been deprived by the present law without introducing the use of notices and forms unsuited to the poorer and uneducated classes, and which it was the especial object of past legislation to avoid.

He had introduced this Bill to effect its early publication, but he did not propose to move its reference to a Select Committee until the Council met in Calcutta.

The Hon'ble MR. STEPHEN observed that it was an illustration of the real importance of the consolidation measures to which so much of the attention of the Legislature had been of late directed, that all the difficulty to which his hon'ble friend had referred in connection with Christian marriages, had been produced by the manner in which the Acts now about to be consolidated was pieced together, and by the uncertainty which arose from the cross references to [illegible] in them. The grievance to which his hon'ble friend had alluded would not, of course, admit of discussion, and the present measure would, it was believed, provide a suitable remedy. In other respects it was entirely a measure of consolidation.

CIVIL COURTS (OUDH) BILL.

The Hon'ble MR. COCKERELL, with the permission of His Excellency the President, presented the report of the Select Committee on the Bill to consolidate and amend the law relating to the Civil Courts in Oudh.

The Council adjourned to Thursday, the 26th October 1871.

H. S. CUNNINGHAM,

SIMLA, *The 19th October* 1871.

Offg. Secy. to the Council of the Governor General for making Laws and Regulations.

GOVERNMENT OF INDIA.

MILITARY DEPARTMENT.

Financial result of the employment of troops in road-making on the Hills.

Endorsed by the Government of India, Public Works Department,—No. 1311 B.—M., dated Simla, the 12th October 1871.

COPY of the following letter, and of its enclosure, forwarded to the Military Department for information, in continuation of Public Works Department, No. 582 B.—M., dated 20th May 1871.

From COLONEL A. FRASER, Officiating Secretary to the Government of the North-Western Provinces, Public Works Department, to the Secretary to the Government of India, Public Works Department,—No. 2745 A, dated Nynee Tal, the 25th September 1871.

IN compliance with the request contained in your No. 980 B.—M., dated 9th ultimo, I am directed to forward, for the information of the Government of India, extract from an inspection report by the Superintending Engineer, 2nd Circle, having reference to the financial results of employing British troops on public works at Ranee khet.

Extract from an Inspection Report by the Superintending Engineer, 2nd Circle, North-Western Provinces.

LEVELLING SITE FOR BARRACKS ON KOOMPOOR HILL.

Estimate	Rs.	35,490
Expended to date	,,	
Allotment for year	,,	22,904
Expenditure during year...	,,	22,901

The site for which sanction has been received to level and clear on Koompoor Hill for cottage barracks are Nos. 1 to 6 inclusive, and Nos. 9 to 20 inclusive. The amount of sanctioned estimate is Rs. 35,490, of which Rs. 22,904 was allotted for 1870-71. This work is being entirely executed by the detachment of soldiers at Raneekhet. In April 1870, 230 men of the Royals and 170 of the 37th Regiment arrived and commenced work early in that month, working throughout the summer five days a week, when not prevented by wet weather. There were generally 300 to 310 men always at work until the middle of December, when the detachment of the 37th returned to the plains, leaving the Royal, who continued the work throughout the winter. The men were employed nearly all the time on the contract system,—their work done every month being measured up at the end of the month, and paid for at the sanctioned rates, with the exception of two months during the rainy season when the men were paid by daily labor; but the result of this was found to be increased rates on work done, and the payment for measured work at the sanctioned rates for different classes of soil and lead was resumed and is now in force. When the soldiers commenced work, on account of being new to the work for the first month, the return of work done was not satisfactory, but they improved steadily, and, on the whole, have worked satisfactorily. The following is the result of the year's work:

						Rs.
18,200	cubic feet clay in soil lead	...	50	feet at Rs. 3	per 1,000 cubic feet	55
1,26,036	,, ,, with an average lead of		50	,, ,, 4	,, ,, ...	504
2,11,882	,, ,, ,, ,,		100	,, ,, 5	,, ,, ...	1,059
35,200	,, stony soil		75	,, ,, 6	,, ,, ...	2,113
1,06,400	,, ,,		150	,, ,, 7	,, ,, ...	745
2,96,628	,, soft rock		75	,, ,, 8	,, ,, ...	2,373
6,85,140	,, hard rock		75	,, ,, 10	,, ,, ...	6,851
1,69,464	,, ,,		150	,, ,, 12	,, ,, ...	2,033
1,02,500	,, ,,		225	,, ,, 14	,, ,, ...	1,435
2,28,480	,, very stiff rock		225	,, ,, 15	,, ,, ...	3,427
65,255	,, hardest rock		150	,, ,, 20	,, ,, ...	1,305

Thus shewing 23,62,185 cubic feet of excavation and rock cutting and removal of soil, at a cost of Rs. 21,900, inclusive of officers' pay, but exclusive of repairs to tools, which cost during the year about Rs. 1,000.

The average earning of the detachment has been—

Non-commissioned officers employed in supervision, 8 annas per diem.

Rank and File, 6 annas 8 pie per diem.

The officers in charge of working parties received as follows:

Captain, Rs. 3 per diem.

Subaltern, Rs. 2-8 per diem.

The average of pay earned by the men may appear high, and possibly the Executive Engineer may get the work done cheaper this year on account of having more skilled labor; but, in the Executive Engineer's opinion, the rates given are not excessive, and the men have worked well, and deserve all they have made. The Executive Engineer is of opinion that on account of the present great demand for labor, had this work been done by local labor, it could not have been executed cheaper, and considerable difficulty would have been experienced in getting it done at all, and in addition soldiers' labor has been most useful in allowing the local labor to be utilized on other important works. The Superintending Engineer entirely concurs with the Executive Engineer's remarks.

32ND PIONEER REGIMENT.

This regiment has now been employed for two years on this road, and most valuable assistance has been received during the past year. The men established an excellent name for themselves as good workmen last year, which they have steadily kept up throughout the last year, always working with a good will and spirit, and Executive Engineer has much pleasure in testifying to the great credit due to Colonel Morgan and the officers of the regiment for the excellent method and efficient supervision of all working parties employed on the road.

The work has been done by the regiment by petty contract; the rates for each kind of work are the same as those originally estimated for local labor and about 30 per cent. for all descriptions of excavations below the rate of which the same kind of work can now be done by local labor, which has risen since the commencement of work over 25 per cent., and no local contractors can now be induced to take up work at the same rates.

The quantities and cost of work done during the year by the regiment are—

Rock cutting—17,31,898 cubic feet, costing Rs. 19,916, rate Rs. 11-8 per 100 cubic feet.

Stony soil—42,18,624 cubic feet, costing Rs. 16,874, rate Rs. 4 per 100 cubic feet.

Earth excavation—84,560 cubic feet, costing Rs. 212, rate Rs. 2-8 per 100 cubic feet.

Total Rs. ... 37,002

and the average earning of the [illegible]

				Rs.	A.	P.
	Subadars		...	1	2	8
	Jemadars		...	0	14	0
	Non-commissioned officers and sepoys		...	0	4	8
The officers in charge of each party received.	Captains		...	3	0	0
	Subalterns		...	2	8	0

which payment, as well as the cost of all powder and fuze used, is included in the rates given.

The regiment was employed from April 1870 to the commencement of the rainy season as follows:

Two parties or four companies between the 26 and 29 miles at Dhokur and Chonnekhan.

One party of two companies at Gongrieghurrie on the 23rd mile.

One party of two companies at Demupona on the 36th mile, and the whole regiment was moved into Deupoe hutted encampment before the rains set in, on either side of which the widening of road had been reserved for the men during the breaks of fine weather in the rains. The regiment was again moved down the road in October, two parties or four companies being stationed at Tota-aim in the 20th mile from Ramnuggur, one party of two companies at Sani in 18th mile, and one party of two companies at Koorrenie in 14th mile on banks of Koosee River, and have been employed the whole of the past winter in opening out the middle section to its full width of 20 feet, and clearing the road from slips from last rains.

The important pieces of work done by the Pioneers during the past year were a cliff of very hard quartzite rock on the 23rd mile, cutting out Gungamghurrie next in the 33rd mile by a party under charge of Captain Jackson.

Heavy rock cutting on the 27th mile by a party under Captain Sumwell cutting out Chonnekhan rock cutting on the 29th mile, and a cliff of quartzite rock on 36th mile by a party under Captain Walker. No local contractor could be induced to undertake any of these works, and had any been worked out departmentally, the cost would have been excessive.

The men of the regiment are now in splendid working condition, and they work in good order and system, to which is due their great success as workmen, and which is attributed, as already stated, to the careful supervision given by the officers in charge. No accidents of a serious nature have occurred in the works this year.

The Superintending Engineer went closely into all the details herein reported, and concurs with the Executive Engineer in thinking that the work done by the regiment is highly satisfactory, and in no small degree due to the co-operation of the officers of the regiment and Colonel Morgan.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

Report on the progress of Irrigation and other Agricultural Works in Bengal for the year 1870-71.

I.—ORISSA CIRCLE.

(A.)—Extraordinary Works.

Mahanuddy Division.

1.—*Mahanuddy Dam.*—This main regulating work for all the Canals in the Cuttack District has been completed. The operations of the past year were confined to finishing off the abutments and making some slight additions to the apron.

2.—*Head Works, Toldunda Canal.*—The head Sluices, with the exception of the gearing for lifting the shutters, were completed during the past year. The head Lock at Jobra was likewise completed early in the season and the gates fitted in place. Advantage was taken of the lowering of the River in May 1870 to raise one of the iron boats sunk in the gale of August 1866, and which lay somewhat in the way of boats entering the Canal. The same opportunity was taken to excavate a broad entrance from the River to the Canal.

3.—*Toldunda Canal.*—The earthwork has been completed as far as the 27th mile, the point to which the construction of the Canal was limited previous to the sanction lately accorded by the Government of India for its extension. The greater part of the turfing of the Canal banks was done during the past season. The remainder was expected to be finished in the rains of 1871.

The Beereebattee Lock and Escape were so far completed before the end of the year as to allow the traffic to pass over the bridges. With the exception of the coping and the dressing of the sills and hollow quoins for the gates, the Lock masonry was finished by the 31st March. By the same period, only the finishing off of the parapets and other upper works remained to be executed at the Regulating Escape.

The Sonepore Lock and Escape were less advanced than was anticipated. The masonry had been built to the level of the flooring in both works. Difficulty was experienced during the freshes of last year in boating materials to the work down the River Mahanuddy, and, after this means of transport failed, the sill and flooring stones had to be carted with much trouble over the 8 miles between Beereebattee and Sonepore.

The excavation for the foundations of the Taharpore Lock and Regulating Escape was nearly ready.

Of the five Syphon Culverts designed to carry off the drainage of the strip of land between the River Pyka and the Canal between the 7th and 27th miles, four have been completed and the arches turned of the fifth. Two drainage cuts, parallel to the Canal, were completed early in the season.

4.—*Distributaries.*—There are 11 Distributary Channels to take off from the Toldunda Canal between the Head Works and the 27th mile, aggregating with their branches about 120 miles in length, and commanding an irrigable area of about 29,000 acres. The state of the earthwork at the end of the year was as follows:—

No. 1 Channel was excavated for about 4 miles.

No. 1½ was more than half done.

No. 2 and branches were nearly completed.

Nos. 3 and 4 were well in hand, the earthwork being about one-half done

Nothing had been done to the earthwork of the remainder.

The head sluices of Channels Nos. I, 1½, 2, 3, 4, and 5 were completed during the year, and fitted with the usual shutters and lifting gear. The head sluices of Distributaries Nos. 6 to 10 were all in a more or less forward state.

The Regulating Drops for the Distributaries were only partly begun during the year, only one having been completed. The masonry in several had however been started, and arrangements made for the delivery of materials to nearly all the Drops and Road Culverts.

5.—*Machgong Canal.*—The whole of the earthwork and all the sodding, except in 2 miles, had been completed.

The head Lock and Regulating Escape at Beereebattee were nearly as far advanced as the adjoining Locks for the Toldunda Canal. The masonry was complete and ready for the hanging of the gates, except some culvert work and the coping and seat for the bridges over the tail bays. The lattice Girder Bridge for the Lock had been delivered at site.

The only Drainage Syphon on this Canal was completed early in the season.

6.—*Distributaries.*—Until the late issue of orders for the extension of the Machgong Branch, the excavation of this Canal was limited to 15 miles. On this length there are seven Distributary Channels, which, with their branches, have a length of about 75 miles and command about 17,000 acres.

The first six mains and several branch channels were aligned and lock-spitted and all the jungle cleared by the end of the year. No. 2 Distributary was excavated for 1 mile, and earthwork on No. 1 fairly commenced. Although no appreciable progress had been attained on the other channels, ground had been broken over a considerable length.

The head Sluices and Shutters to Channels Nos. 2, 3, 5, and 6 were completed, and the masonry of Nos. 4 and 7 was half built by the 31st March.

Materials had been collected for the Regulating Drops, Road Culverts, and other minor works.

Beropa Division.

1.—*Kendrapara Canal.*—The work done on this Canal during the past year consisted of some finishing up work to the Locks, raising the embankment on each side 1½ feet, and planting cocoanut and other trees.

2.—*Distributaries* —The total length of entirely new channels excavated during the year amounted to about 19½ miles, and the work for the [illegible] cutting new branches and extending [illegible] channels. A considerable number of small masonry weirs for regulating the level of the water in the different Reaches were built in the existing channels.

The banks of nearly every Distributary were materially strengthened, and in some cases the beds deepened where further excavations was found necessary to improve the discharge. Many of the existing minor masonry works, chiefly aqueducts over drainages, were also improved where required.

The masonry works executed during the year were 20 head Sluices, 2 Syphon Culverts, 9 Bridges, 47 Regulating Weirs, and 72 Masonry heads of supply to Field Channels.

The total length of Distributary Channels, main and branch, taking off from the Kendrapara Canal is now 174 miles, by which an area of about 80,000 acres is directly commanded, and this extent might, without difficulty, be increased to 100,000 acres. The total area ultimately to be irrigated is estimated at 110,000 acres. The efforts during the past year were confined to the perfecting of the first 13 channels. No new head sluices were commenced in the main Canal, and nothing beyond the completion of the survey was done to the Distributaries proposed to be carried out east of the 24th mile of the Canal.

Brahminee Division.

1.—*Beropa Dam and Head Works connected therewith.*—In April and May 1870 the erection of large shutters, on what is termed the French principle, was vigorously proceeded with. After the removal of the old piers, the double shutters, which had previously been framed together in the Jobra Workshops, were fitted into position in a very satisfactory manner by the Executive Engineer of the Workshop. Various minor improvements, which the working of shutters on the same principle in the Mahanuddy Division proved to be necessary, were carried out, and with marked effect.

A fish ladder, similar in its leading features to works of a similar character in England and Ireland, has been constructed at the south end of the Beropa Dam. The average slope of the floor is 1 in 12, the still water compartments being about 10 × 12 feet in extent, and having

openings 18 inches wide by 2½ feet high for the passage of fish at the alternate corners. The ladder was constructed entirely of masonry and cost about Rupees 1,042. It will probably be a season or two before the fish learn to take advantage of the passage provided for them, and means must be taken to prevent any one approaching the abutment of the Sluices. Last season, in consequence of the parapets to the abutment walls not being built, such fish as ventured to try the ladder were liable to be assailed both from above and below. The openings in the still water chambers had to be fitted with boards to regulate the force of the current.

Nothing was done during the past year to the Head Works on the Jugguthpore side of the Beropa Dam, except building the parapet walls to the Dam and head Sluices.

At the Chowdwar or north end of the Beropa Dam, the channel leading to the under Sluices has been much improved, the 60 feet channel having been widened through rock to 80 feet. The approach to the Lock entrance has also been widened to the manifest safety of boats entering and leaving the Canal. The parapet walls of the Head Sluices to the High Level Canal have been nearly completed.

The original design prepared by the Executive Engineer of the Workshop for lifting the head Sluice shutters was found to be expensive, and the weight of the apparatus too great to allow it to be readily moved from one set of Sluices to another. Another design of a simple character has been prepared for the head Sluices of the Toldunda Canal, and if the lifting gear is found to answer there, it will be applied to the head Sluices of the Kendrapara and High Level Canals. The head Sluice shutters are at present worked without much trouble by an arrangement of multiple pullies slung from triangles.

2.—*High Level Canal.*—During the past year, when the water was run off from the High Level Canal for annual repairs, a great advance was made in widening the unfinished portions of the cuttings in rock and earthwork. The widening of the rock cuttings has had a material influence on the discharge of the Canal, which, during the irrigation season of 1870, was found towards the northern end, to be not more than capable of conveying a sufficient supply to the Distributaries. This, however, was only on occasions when the supply in the River Mahanuddy itself fell short, for the river on certain days, even in July, August, and September, had barely 9 inches depth of water running over the Jobra Dam.

The excavation of the rock [a sort of syenite] in the Sribuntpore cutting on the 26th mile of the Canal proved a very tedious matter, as large boulders of the hardest quality were found constantly cropping up though the laterite. The cutting has been all but completed however.

The earthwork of the Canal from the 26th to the 33rd mile was all but completed by the end of March, a short length of the 27th mile being all that remained then unfinished.

The embankment constructed in connection with the first range of this Canal, and stretching for 10 miles up the right bank of the River Brahminee beyond the out-fall Lock at Janapore, was completed in October last. This embankment is a most important one, as the last 6 miles of the Canal are dependent upon it for security in times of high freshes. It cost, however, a much larger sum than was anticipated in consequence of a greater height and section than was at first designed having been given to it.

The chief masonry works on the high Level Canal under construction last year were the Lift Lock at Emamnugger, the out-fall Lock to the River Brahminee at Janapore, and the Aqueducts over the Quorai and Marthagunga Nullahs. On the two last mentioned works considerable progress had been made by the 31st March. The masonry has been put together in a most substantial manner.

The progress made on the above mentioned Locks, especially the Lift Lock at Emamnugger, was not so satisfactory as could have been wished. The masonry was not commenced early enough to ensure the opening of the Lock before the rains. It must be admitted, however, that the removal of the large boulders from the Lock site was a very tedious process. As stated above, the bed of the Canal was found both above and below the Lock to be encumbered with these enormous blocks both *in situ* and buried in the laterite. Their removal on a much smaller scale in former years seriously interfered with the excavation of the lower cuttings at Santipore, Jamdhur, and Kyra. It was hoped, however, that the gates of the Emamnugger Lock would be hung and the Lock opened before the end of June.

3.—*Distributaries.*—The total length of Distributaries taking off from the first range of the High Level Canal will be about 113 miles.

Of these, 36 miles lie beyond the Rivers Burra and Chota Gungootee, and will not be commenced until the syphon or dam across the former river is begun. Of the 77 miles of channel left between the Canal and the River Gungootee, 52½ miles have been completed, 20 miles of which were carried out during the past season.

All the head Sluices to the Distributaries of the first range, with two additional Sluices for intermediate channels, have now been built and supplied with shutters. Six of the above were built during the year, and twenty-three falls or minor masonry works for regulating the level of the water in the Distributary channels were commenced in the same period.

Pooree Division.

The works under the head Extraordinary in this Division consisted of the Regulating Weir at Naraje and the Embankment connecting it with Cuttack. Both these works are completed to the extent at present contemplated.

Workshop Division.

With the exception of outer plastering, the Smithy, Foundry, Engine-room, Machine Shop, and Chimney have been completed. The Vertical Saw Shop and Carpenters' Shop have still a little of the flooring and roofing to be finished. A small Pay Office and Charcoal Godown have been added to the Smithy, and finished during the past season.

The most important work now to be taken in hand is the extension of the Shafting from the Vertical Saw to the New Machine Shop, and the transfer of the Machinery from the temporary building. The top driving Shafting is now being fitted into place.

The completion of the Davies' Steam Striker may be early expected. This, with two Lathes now at work, is the only new machinery purchased during the year for the shop.

(B.)—ORDINARY WORKS.

Mahanuddy Division.

The number of retired lines of embankments for which sanction was obtained in 1870-71 was 10. Nearly all the most important ones were completed before or during the rains of 1870. Such as remained to be completed on the 31st March 1871 only required to be turfed, and this was expected to be finished before the 31st October next.

A new embankment, 4½ miles in length, has been constructed down the right bank of the River Mahanuddy from Jobra to Buddeemool. It serves to protect the country from floods between the river and the first 5 miles of the Toldunda Canal. The work was, with the exception of portion of the turfing, completed within the year. A self-acting Sluice to pass off drainage water was built into the embankment near its lower ends.

Three irrigation Sluices were executed during the year, two on the River Billoonkye to irrigate the lands of Pergunnah Sychoor, and one on the River Soorboan to irrigate Pergunnah Kodinda. The Zamindars whose lands benefited by the Sluices paid in each case half the cost of the construction of the works.

A new Inspection Bungalow has been buit at Juggutsingpore, the head-quarters of one of the Collectorate Sub-Divisions.

A number of gauges were erected at various important places on the rivers to ascertain the relative levels of flood by simultaneous readings. At the end of the present rains a useful series of flood levels will be available for comparison with a given height of flood at Naraje.

Beropa Division.

Three Inspection Bungalows have in the course of the year been under construction at Kudulsai, Dammerpore, and Pundalow.

Brahminee Division.

Only one retired line of embankment and that on a small scale was found necessary on the rivers within this Division. The new bund, which is 2,500 feet in length, was constructed on the left bank of the River Brahminee, and was, with the exception of the turfing, completed within the year.

Pooree Division.

Original Works.—No new retired lines of embankments were commenced in this Division in 1870-71, but the following bunds of the previous year were completed, *viz.* :—

	Length.
Brahmineeparra	1,636 feet.
Putturpuddah	728 „
Bamdaipore	1,548 „
Tenobattia	1,200 „

All the above embankments were on the River Bargovee the two first being necessitated by breaches in 1869, and the two last by the existing bunds being in a very dangerous state.

At Danwodurpore near where the Pooree Road crosses the Bargovee River, the embankment and village had for some time been in a very critical state for some years, the village in fact being built on the bund. To save the village as much as possible, the Executive Engineer gave the foreshore a long slope of 3 to 1, commencing the slope from the bed of the river, and throwing the spoil immediately behind to form sites for the new houses. This expedient, which generally saves an expensive retired line, was adopted very successfully in various places by the late Superintending Engineer, Mr. Crommelin. In the present case the result has been very satisfactory.

Seven new Sluices were sanctioned for the irrigation of the lands protected by the embankment of the Rivers Dyah and Bargovee in Pergunnahs Limbai and Kotbang. The men who originally applied for the works having shewn a decided unwillingness to deposit the usual advances, the sites of the Sluices were, with the permission of Government, altered to other localities where the Zamindars were more in earnest in providing their share of the estimated outlay. From this cause the works were delayed and could not be completed by the end of the year.

(C.)—Repairs.

Mahanuddy Division.

The impounded water above the Mahanuddy Dam was drained off in May 1870 to allow the shutters of the centre Sluices to be properly repaired. This necessity of employing the pool above in order to effect repairs is undoubtedly a set-off against the other advantages which the French system of double shutters possesses. The principal sources of weakness were the chains, which were not in the first instance tightened up to a uniform strain, and were in themselves in many instances too slight for the shock of the up-rising shutter. Various modifications of details were adopted, and the repairs to the machinery were just completed in time before the freshes came down.

The damage done to the apron of the centre Sluices by the floods of 1869, though not serious, was greater than was anticipated. The action of the current was most visible at the north end, where the set or direction strikes the Sluices at an angle. In consequence of the island above the dam, the main strength of the stream does not approach the Sluices in a direct line to the opening. The repairs to the Sluices, apron, and the rest of the dam were thoroughly executed.

The usual annual repairs to the embankments, of which there are 248 miles in the Division, were carried out where most necessary. The money was pretty uniformly distributed over the different embankments; but those on the Rivers Soorooah, Olunka, Daib, and Billooakye received the most attention.

The embankments round the City of Cuttack were put in thorough repair, and the series of small groynes of brushwood, which protect the embankment above Jobra, were very effective during the freshes.

The whole of the Katjooree revetment was pointed and underpinned where necessary. The river is changing so much on the opposite side near Chargurriah that the wall will require careful watching until the Katjooree Weir is built.

Beropa Division.

The chief work of maintenance in this Division consists in removing the silt deposited in the first 3 miles of the Kandrapara Canal. In the head Sluice channel the deposit various in thickness from 2½ to 3½ feet and diminishes to 3 inches at a distance of 3 miles from the head Lock. The quantity deposited in the freshes of 1870 was certainly less than the accumulation removed after the flood of 1869. This was probably due to the volume of supply being maintained at a more uniform rate throughout the year. The Naraje Head Works were maintained throughout the year in a thorough state of repair.

The silt clearing, weeding, and closing of breaches, of which there were a considerable number in the Distributary Bunds during the irrigation season of 1870, as well as repairs to head Sluices, Weirs, and other masonry works, were carried out at an expense of Rupees 16,652.

The embankments throughout the Division were repaired and brought to the sections provided for in the estimates.

Brahminee Division.

The apron and masonry works of the Beropa Weir were well looked to and repaired before the freshes of 1870, which inflicted no damage whatever on the works. No repairs, with the exception, of the re-welding of a broken link, were necessary to the shutters on the French

system erected at the Juggutpore side of the Beropa Weir after the freshes of last year. The apron also stood the rush of the current exceedingly well, scarcely any stones being removed out of place.

Heavy silting had taken place in the High Level Canal, and the weeds were so bad in the first six miles that navigation was much inconvenienced.

These obstructions were everywhere most effectively removed. The iron-work of the bridges was re-painted, and numerous other petty repairs were executed during the year. The Canal is in excellent order and perfectly free from silt and weeds.

Pooree Division.

During the year about 250 miles of bund were raised, strengthened in section, and turfed, as their state required. At places marginally noted, where the rivers were coming dangerously near the embankment, the river foreshore was sloped off with good effect for distances aggregating 5,500 feet.

Shintputna on the Kooshbuddra.
Bassooaghye .. Kooakhye.
Mullickabad
Bujpore
Gokulpore
Kupallessurpore
} Bargovee.

Seven brushwood spurs, having a total length of 2,659 yards, were constructed before the rains of 1870 at Charghurria, on the right bank of the Katjooree, opposite Cuttack. The effect of the spurs was beneficial on the whole, two of them having been quite buried in the sand they had collected. The others were only partially effective, being too much exposed to the strength of the current to collect a deposit.

One hundred and twelve embankment Sluices were repaired during the year.

General Remarks.

Labor.—Throughout the year labor has been obtained from the local Districts in numbers sufficient for the works.

Rates.—The rates for earthwork and masonry have been favorable, and materials when carried by native boats on the rivers cost about 4½ pie per ton per mile. In the early part of the year the freight charged on stores brought for the Workshop from Calcutta and Madras was Rupees 20 per ton. Lately this rate has been reduced to Rupees 15 per ton.

Navigation.—The extent of Canal navigation open to the public in this Circle was during the past year as follows:—

	Miles.
Kendrapara Canal	39½
High Level „	26
Toldunda „	7
	72½

In June 1870 the 1st Reach of the Toldunda Canal, seven miles in length, was opened. At the present date a further distance of eight miles is available to the public for navigation on this Canal and four miles on the Machgong Branch.

The length of water communicatian on the Toldunda and even on the High Level Canal has been too limited hitherto to expect them to be much used by the public. In October last two passenger boats were started by a private firm to carry pilgrims and others between the 22nd mile of the High Level Canal and 2nd mile of the Toldunda Canal. The boats which were constructed in the Jobra Workshops were unfortunately not ready at the time when pilgrims in greatest number are on the road. The results were not therefore during the year so encouraging as they otherwise might have been. The boats, however, plied with tolerable regularity and carried in six months 2,574 passengers.

A number of iron boats belonging to this Department were lent on hire to the local Agent of the British India Steam Navigation Company with the view of developing the traffic on the Kendrapara Canal between Cuttack and the sea-board. By this means and by the help of the Steamer *Teesta* the traffic between Cuttack and Calcutta has attained fair proportions, and is still increasing. A Steam Barge capable of carrying about 80 tons of goods has been built in Calcutta for a private firm on purpose for the through traffic of the Kendrapara Canal, and is expected daily.

The following abstract shews the number and tonnage of the boats using the Canals, the tollage, and other particulars connected with the navigation of the Canals during the past year :—

Name of Canal.	Number of boats passed through each Canal.	Tonnage.	Approximate value of Cargo.	Number of passengers carried.	Tollage.
			Rs.		Rs.
Kendrapara Canal ...	4,294	37,399	38,52,403	969	13,926
High Level „ ...	461	1,645	50,777	2,574	439
Toldunda „ ...	1,162	30,278	4,86,341	2,784	2,265

Irrigation.—The irrigation from the Rivers Mahanuddy and Beropa between the Canal Head Locks was maintained without interruption, except during the period when the former river was lowered to allow of the large Sluices being repaired. The current through the Sluices in the middle of the Mahanuddy dam made no perceptible change on the islands above, but the draught to the Sluice openings is gradually deepening one of the side channels through the islands. The Beropa Channel remained in very good condition throughout the season. A Dredger was employed during the summer months in keeping the entrance to the Kendrapara Canal open. It raised in eight months 205,305 cubic feet of sand and silt, at a cost of Rupees 1,339, or at the rate of Rupees 6-8-4 per 1,000 cubic feet.

Rain-fall.—The rain-fall during the year 1870 was 48·92 inches in the Station of Cuttack, or 5½ inches under the average of the last 15 years. The rain-fall in July and September was exceptionally low over the greater portion of the district, and the crops suffered accordingly. But for timely rain-fall in October, the crops in many parts of the country must have perished.

Floods.—The floods throughout the rains of 1870 were moderate in all the Orissa Rivers. The limit of safety for the embankments in the Pooree Division being taken as 76·00 on the Lallbaugh gauge, the following are the levels attained by the four highest freshes of the season :—

24th June	...	...	...	72·30
20th July	...	...	...	72·10
2nd August	...	...	...	74·10
31st August	..	...	...	72·60

A somewhat sudden aud unusual flood occurred on the 1st November, when the river rose in a few hours 6½ feet on the Lallbaugh gauge.

Shutters in the Beropa Dam.—The shutters on the French principle were closed in the Beropa Dam on the 12th of October, and on the 18th of the same month in the Mahanuddy Dam. At the Beropa Dam, on reversing the lever, all the shutters rose in 1 minute and 35 seconds. The water was passing through the sluice-openings with a depth of 4 feet 8 inches, and velocity, by current metre, of 9½ feet per second. The check to the current caused by the almost instantaneous closing of 176 lineal feet of opening raised the surface level of the river 6 inches in 5 minutes. The improved method of fixing the clutches on the reversing lever adopted at the Beropa Sluices by Mr. Faulkner worked most successfully. The shutters instead of rising in lineal rotation came up alternately.

The Chilka Lake.—The mouth of the Chilka Lake has remained in good order throughout the season. In the month of January 1871 its entrance just inside the bar was 470 feet wide by 30 feet deep at low tide. In May 1871, the breadth at low water was 420 feet with a depth of 12 feet in the middle.

Establishment.

The strength of the Engineer Establishment of this circle remains unchanged, there being five Executive Officers in charge of the five divisions composing the circle, and one additional Executive Engineer attached to the Brahminee Division. There are six Assistant Engineers, all of whom have immediate charge of one or more sub-divisions.

The strength of the Upper and Lower Subordinates in the 23 sub-divisions into which the divisions are distributed was at the end of the year as follows :—

Upper Subordinates 26, of whom two are temporary grade men.
Lower ditto 22, ditto ditto.

II.—SOUTH-WESTERN CIRCLE.

The South-Western Circle has been superintended during the greater part of the year by Colonel P. O'Connell, R. E.

In February last, this officer's services having been temporarily placed at the disposal of the Government of India, Lieutenant-Colonel J. F. Stoddard, M. S. C., assumed charge of the Circle.

When the last Annual Report was made, the South-Western Circle consisted of four Divisions, namely, (1) The Cossye; (2) Hidgellee; (3) Selye; and (4) 24-Pergunnahs Division.

In December last the Damoodah Circle was suppressed, the Damoodah Canal Works having been stopped by the Government of India in June, and its two divisions blended into one were added to this circle as a fifth division and called the Burdwan Division.

The works executed during the year were as follows :—

(A)—Extraordinary.

Cossye Division.

The works in this division consisted of that portion of the high level canal, between Midnapore and Oolooberriah, forming the last link in the canal which is eventually to connect Cuttack with Calcutta.

As described in the last report, this portion of the canal is divided into 8 reaches. A concise description of each important work, showing the state of progress up to 31st March 1871, will now be given, commencing at Midnapore—

Reach No. 1 *inclusive of head-works.*—The weir across the Cossye at Midnapore was completed to a height of 3 feet below the original design. It is intended that this height of 3 feet shall be given by means of Fouracre's tumbling shutters, to be fixed on the present crest of the weir. These shutters have been fixed on the weir at Panchkoorah, and the trial which they will undergo this season will test their efficiency.

The under-sluices, head lock, and head sluices, with the exception of the working gear for the last mentioned work, were completed.

The canal forming No. 1 reach was excavated to the full width, *viz.*, 48 feet on sole, and all the irrigating sluices were fitted with working gear.

Reach No. 2.—The canal was completed. The concrete foundations of the lock were nearly finished, and the masonry fall at the head of this reach was completed with the exception of the lower apron.

Reach No. 3.—The canal was completed. The excavation for the Lock foundations was finished, and the concrete work about to be commenced. The masonry fall was completed with the exception of the lower apron.

Reach No. 4.—The canal was completed. The concrete foundations of lock were about to be commenced, and the masonry fall was built up to within 4 feet of the top or crest.

Reach No. 5.—Earthwork in canal was half done, and materials for the lock and fall collected, but work was not commenced. The foundation excavation for the aqueduct over the Kerai Nuddee was finished, and some of the materials were collected for the work.

Reach No. 6, *including the weir and head-works at Panchkoorah.*—Weir across the Cossye was completed, with the exception of the lower apron and shutter gear of the scouring sluices. The channel leading to the under-sluice under the left bank of the river was being excavated.

The lock at the head of this reach was completed, with the exception of the gates, which were not yet put up. The head-sluice was also completed.

The canal in this reach has been used for navigation for some time; but, owing to the level of the water in it being much higher than the country through which it runs, the banks are often breached, especially in stormy weather. The earth of which the banks are made is also not good, which is another reason why breaches occur in this reach. In order to mitigate this danger as much as possible, it will be necessary to provide masonry outlets in the banks and increase their section in the most dangerous places.

The Dainan Lock at the east end of this reach was repaired during the year and has been constantly in use since.

Reach No. 7.—This reach is purely tidal and without locks, consequently it has silted up to such an extent as to mar its usefulness as a navigable canal. It will be necessary to construct a lock at each end to make it navigable in all states of the tide.

The navigation of the Roopnarain between this reach and Dainan is also tedious, and at times, when the "bore" prevails, very dangerous. It will probably be found necessary to divert the western end of this reach to a point nearly opposite to Dainan.

Reach No. 8.—The re-construction of the walls of the lock at Bansberriah were completed and the canal re-opened to traffic, but unfortunately the lock at the other extremity of this reach at Oolooberriah began to show signs of failure, and it was deemed prudent to pull down the walls in January last and to re-build them. The failure of the walls was partly attributable to insufficient section; the work was generally found to be very fair.

These failures considerably reduced the revenue derivable from tolls. The following statement shows the amount of tolls received in the year 1870-71:

Range.	Amount.	Total.
	Rupees.	Rupees.
Range I.	7,232	
„ II.	2,203	
„ III.	3,898	
„ IV.	11	
Grand Total ...	.....	13,344

Distributaries.—Nearly 105 miles of distributary channels had been excavated or were in hand at the close of the year.

The area which it is expected these channels will command in the season of 1871-72 is upwards of 65,000 acres. In 1870-71 only some 35,000 acres were commanded. Great efforts will have to be made for another working season or two to complete the whole of the distributaries under the Midnapore Canal: the chief difficulty is the leading of the materials to the sites of the small masonry works required to be constructed on them, and which are very numerous.

Hidgellee Division.

The works under construction during the year were the locks in the tidal canal, four in number, connecting the Russoolpore with the Huldee, and the latter with the Roopnarain River. The lock first in order (commencing at the Roopnarain) is the Banka. The excavation for the foundations was completed and two-thirds of the bearing piles had been driven, when a large landslip occurred and delayed the further prosecution of the work. The greater portion of the materials for the lock has been collected at site, and the work it is expected will be completed in another season.

The next in order is the lock at Etamuggra, which connects reach No. 1 of the canal with the Huldee River.

This lock was completed and opened to traffic on the 20th April 1870.

The lock at Terapakia connects the Huldee with the second reach of canal.

At the close of the year the masonry was raised on an average to the level of the upper sill, the quantity of masonry being about 80,000 cubic feet or half the total estimated quantity. The lock it was expected would be completed, so far as the masonry is concerned, before the rains of 1871, as nearly the whole of the materials had been collected at site.

The last lock is that at Kallynuggur, which connects the second reach of canal with the Russoolpore River. This lock was completed during the year, and all that remain was to hang the gates, which had been received from Cuttack.

It is therefore anticipated that all the locks in the tidal canal will be opened to traffic in 1872.

During the year the silt excavation which had been commenced in January 1870 was completed under a repair estimate and the two reaches re-opened to traffic last April.

In connection with the tidal canal should be mentioned the means to be adopted for getting rid of the drainage which the canal intercepts. It would appear to have been the intention of the late Canal Company's Engineers to drain the country into the canal itself by means of sluices, as provision had been made in their estimate for 15 sluices in No. 1 Range,

and 19 in Range No. 2. Since the canal has come into the possession of Government the idea of using it for the purposes of *irrigation* as well as navigation has been entertained, and as this cannot be done without raising the level of the canal water some 2 or 3 feet above the level of the ground, it becomes an important question how the drainage is to be dealt with. The Executive Engineer has made a rough estimate for cutting "catch drains" to lead the water into the rivers on both sides, and providing sluices where they cross the marginal embankments of those rivers. The amount of this estimate is about Rs. 1,30,000, to meet which there is a balance remaining from the sluice estimate of Rs. 19,820 only, leaving upwards of a lakh of rupees to be provided. This is a large sum to pay for the purpose of providing an uncertain and precarious irrigation to a few hundreds of acres. This subject is now under consideration, as some decision must be come to as soon as possible, since the canal itself is approaching completion.

The revenue derived from the tolls on the tidal canal during the year 1870-71 amounted to Rs. 14,355.

(B.)—Ordinary.

4. The following works under this head were in progress during the year:

Hidgellee Division.

(1.) Construction of a dam and sluice across the Peechabunnee Khall in the line of the Sea Dyke in the Majnamootta and Kalindee Balsye Pergunnahs. The concrete foundations were laid in 1869-70, and during the past year the masonry work was all but completed. A very small portion only remained at the close of the year.

Amount of estimate, Rupees 1,36,250.

This is an important work, which provides for the drainage of 118 square miles of country. There are 22 vents of 5 feet span each, giving a total waterway of 770 square feet. The earthwork of the dam was completed to very nearly the full extent during the year.

(2.) Construction of protective works in connection with the Sea Dyke.

These consist of groynes constructed with earth, with brushwood spurs at their extremities. They are designed with the view of checking the erosive action of the current along the coast by accelerating the deposit of sand and silt in front of the Sea Dyke.

Amount of estimate, Rs 21,250.

There were originally eight of these groynes and spurs, but four more were added during the past year. They have had a very marked effect, having raised the beach on an average from 3 to 5 feet, and caused the accumulation of land or "dunes" on the coast, which will be a great protection to the Dyke itself.

(3.) Re-alignment of the Bhograi Pergunnah Embankment on the left bank of the Soobunreekha.

Amount of estimate, Rs. 25,799.

Two-thirds of this work had been completed in previous years; the remaining one-third was done in the year under review. The turfing and dressing alone remained to be done on the 31st March 1871. This will be carried out during the approaching rainy season.

(4.) Re-construction of embankments round Doro Dumnan Pergunnah.

This work, which was rendered necessary by the almost total destruction of the original embankment by the storm-wave of 1864, was all but completed in 1869-70. All that remained to be done was turfing and dressing.

Amount of estimate, Rs. 36,639.

(5.) Construction of sluices in the Doro Dumnan Embankment.

These sluices, eight in number, are, with two exceptions only, intended to replace sluices destroyed by the storm-wave of 1864. They were sanctioned in October 1869, but were ordered to be postponed immediately after, owing to the financial restriction. During the year under review, little more than collecting materials was done towards carrying out their construction. This delay, however, is little to be regretted, as time was thereby given for revising the original plans, which were considered defective and unsuited to the soil on which the sluices are to be built.

Amount of estimate, Rs. 33,752.

(6.) Construction of embankments and sluices for reclaiming salt lands in Tumlook and Mysadul.

Amount of estimate, Rs. 1,51,050.

The lands which these works are designed to reclaim were formerly used for the growth of fuel required for the salt works carried on by Government in this district. On the abolition of the salt manufactory, the lands were leased out for agricultural purposes, and it became necessary to protect them from the influx of salt water. There will be when the work is com-

pleted, 25½ miles of embankment pierced by 24 new sluices providing 831 square feet of waterway for reclaiming 25 square miles of country. During the past year the earthwork of the embankment was so far completed that about one-ninth only remained at the close of the year. Turfing and dressing will be completed in the rains of 1871-72.

None of the new sluices have been built, but nearly the whole of the materials were collected for them during the year. As remarked above, with reference to the Doro Dumnan Sluices, the original designs of these sluices will also have to be revised.

(7.) Re-construction of sluice in the Ramnugger Khall.

Amount of estimate, Rs. 24,829. This sluice is to replace the one which was destroyed by accident in 1869. The design has been modified in many particulars, and the masonry will now rest on bearing piles. During the year the concrete foundations were got in and one-third of the superstructure completed. The sluice will be completed in time for the rains of 1871.

24-Pergunnahs Division.

1. Constructing a retired life of embankment at Rungafullah. This work was nearly completed.
Amount of estimate, Rs. 15,430.

2. Constructing a sluice in the Puschimbahinee Khall. Three-fourths of this work were completed at the close of the year.
Amount of estimate, Rs. 29,278.

3. Excavating a drain on west side of Diamond Harbour Road. This was completed during the year.
Amount of estimate, Rs. 37,290.

4. Constructing an inspection bungalow with out-offices at Soorjeepore. Work had not been commenced, but materials were collected during the year.
Amount of estimate, Rs. 2,952.

5. Constructing a retired line of embankment at Gurchumuck and Doorgapore, of which about one-third was done in the past year.
Amount of estimate, Rs. 2,767.

6. Constructing a retired line of embankment at Dowany, Chowany, and Punchany Guzrat. About one-eighth of the work was done.
Amount of estimate, Rs. 4,891.

Besides the above, several minor new works were executed in this division during the year, the total expenditure on which in the year was below Rs. 3,000, exclusive of an expenditure of Rs. 6,750 on two *local* works, *viz.*, the construction of a sluice, and erecting boundary pillars in the Punchanogram estate.

Burdwan Division.

Only two original works were executed during the year 1870-71, *viz.*, a retired line of embankment at Kajladee, and construction of spurs in the River Damoodah; the total expenditure on both works in the year being Rs. 4,540.

Selye Division.

The only new work executed was the completion of the Ghatal Circuit Embankment, the expenditure on which amounted to Rs. 3,985.

(C.)—REPAIRS.

The work executed under this head may be classed as "Special" and "Ordinary." To the former belong the following:

1. Re-construction of the Oolooberriah Lock walls. The necessity for this work has already been alluded to in this report. The amount expended during the past year was Rs. 5,480, out of an estimate amounting to Rs. 33,754. The work was being carried out with all possible vigour, in order that the canal might be re-opened before the rains set in.

2. Clearing out silt from both reaches of the Tidal Canal.

Owing to the terminal locks not having been completed as yet, the "tides" find free ingress and deposit a good deal of silt in the canal, necessitating an annual outlay in clearance. During 1870-71 a sum of Rs. 7,063 was expended on this account out of an estimate amounting to Rs. 12,482, which is less by Rs. 2,000 than the receipts from tolls during the year as already stated in a previous part of this report.

Under the head of Ordinary Repairs it is unnecessary to specify each work, as the chief portion of the expenditure was incurred in the usual annual repairs of canals, embankments, sluices, and buildings throughout the circle.

GENERAL REMARKS.

The year 1870-71 was not marked by any special event. No high floods occurred in any of the rivers in this circle, and the quantity of rain was much below the average of the two preceding years, one of which however, *viz.*, 1868, was an unusually wet year. Early in the month of March, however, a good deal of rain fell accompanied by high winds. This was very unseasonable and unfortunately caused some serious losses in materials, such as bricks and lime, which were being manufactured or collected for the works on the High Level and Tidal Canals.

The following is a statement of the rain-fall from 1st January to 31st December 1870 at the several head-quarter stations of divisions in the circle, compared with the average of the two preceding years:—

	1870.	Average of 1868 and 1869.
Calcutta	61·26	76·74
Contai	55·79	78·33
Midnapore	47·23	56·55
Burdwan	40·54	58·60

During the year, the Executive Engineer of the Selye Division, Mr. A. J. Hughes, has been investigating a project, which originated with Captain Smyth, R. E., for controlling the floods of the Selye, by means of reservoirs to be constructed on that river. Under Mr. Hughes's supervision, 1,500 miles of survey and levels have been executed, and much statistical information has been collected, which, as far as it is possible to form an idea, give fair promise of one at least of the reservoirs, *viz.*, that near Kudumdeolee, proving remunerative to the State, and being appreciated by the landholders under it. It is, however, too soon to express an opinion on the subject, till the estimates have been prepared, which Mr. Hughes is now engaged in doing.

The accounts of the several divisions in the circle have been punctually rendered to the Controller's Office during the year.

Revised estimates for some of the works on the High Level and Tidal Canals are under preparation, as, owing to circumstances which have been explained elsewhere, such have become necessary.

III.—SONE CIRCLE.

(A.)—EXTRAORDINARY.

Dehree Division.

1. *Well-sinking at the Sone Weir.*—At the weir 790 foundation blocks were constructed during the year, of which 573 were sunk, and it was expected that the line of foundations would be completed across the river, with the exception of a gap of 580 feet, before the freshes set in. This is a great achievement, and could not have been accomplished had it not been for the "Fouracre's Excavator," which continues to work in the most satisfactory manner; by its means a block 10 feet high can be sunk on an average in three days.

The very long continuation of last rains delayed the commencement of the work in the river bed quite a month beyond the usual time, so that it was not until December that a fair start could be made. Had it not been for this, it is certain that the line of wells would have been sunk uninterruptedly across the river; but the closing of the gap of 580 feet above mentioned would have involved the construction of a large temporary dam and the turning of the main stream of the river, and this could not have been done in time. At the commencement of the season this stream flowed in two channels, one of which was diverted into the other by means of a temporary dam. In the bed of this diverted channel the upper line of centre under-sluice blocks has been completed since the close of the financial year.

The foundation of the under-sluices at Dehree and Baroon has been steadily continued; this consists of square blocks of masonry sunk close together into the sand below water level, filled with concrete inside and between. At Baroon, however, a bed of clay extends same distance into the river, and for so far the platform has been laid solid.

2. *Head Sluice, Dehree.*—The head sluice excavation on the Dehree side has been completed and masonry commenced; it was hoped the foundation would be in a forward state before the rains set in.

3. *Head Locks.*—Nothing was done to the head locks during the season, but the foundation of that at Baroon was laid just before the commencement of last rains.

1. *Head Lock and Sluice Channels.*—The head lock and Sluice channel had not made much progress owing to an outbreak of cholera in the rains. Besides, as soon as the water in the Sone had subsided, the work was stopped, in order to concentrate all labor on the weir. There is no urgency, however, about this work, which can be completed long before the weir is sufficiently raised to admit of water being let into the canal.

5. *Tramway to the Quarries.*—The tramway was opened from the quarries to Dehree as a single line, a distance of 7 miles, and the line continued on to Baroon across the Sone 3 miles further; it was intended, however, to remove this latter portion before the freshes came down. The channel of the river was bridged by a substantial timber structure 570 feet in length, consisting of stout piles driven 10 to 12 feet into the sand in bays of 12 feet long; the rails were carried by longitudinal beams, which were to have been removed in the freshes, leaving the piles standing. Considerable lengths of siding and one-sixth of the double line were laid during the year. The locomotives are found to work satisfactorily, and can draw a train of 25 tracks loaded with 100 tons of rubble stone without difficulty. The fuel used is coal from the Palamow mines, which answers admirably.

6. *Engine-shed, &c., for Tramway.*—A coal-stage and godown were ready for use. The other buildings were about two-thirds finished.

7. *Accommodation.*—In the division 26 bungalows in all have been completed; of these three are shelter bungalows in the jungles on the Sone and in Palamow; 2 are offices and 2 hospitals, thus leaving 19 residences for officers and subordinates at Dehree, Baroon, and the Quarries; 4 more houses were in progress and were expected to be completed before the rains. Several of the finished bungalows have been transferred to the Sasseram and workshop divisions for the accommodation of the staff attached thereto. Two lines of sheds for lower subordinates were put in hand and almost completed.

8. *Hospital.*—A large new hospital begun during the year was expected to be ready before the setting in of the monsoon.

9. *Sleeper supply.*—The sleeper supply from the jungles at Mudhookhopea on the Upper Sone was well maintained during the year, and it was hoped that by December next all the sleepers required would be delivered.

10. *Quarries at Dhodand.*—A contract has been entered into with a Native to supply all the stone required for the weir and head-works; hitherto there has been very great difficulty in procuring a sufficient number of laborers for the quarry work, and a mere fraction of the total quantity of stone required has as yet been quarried; it is hoped that the new arrangement will prove satisfactory.

11. *Lime and Mortar.*—Before the freshes last year a number of pillars were constructed in the river bed with mortar composed of different descriptions of lime mixed with different proportions of soorkee; almost immediately after the pillars were built they were covered by the river, so that the test of the mortar may be considered as very perfect. It was found on the subsidence of the floods that the lime from the flat shaly stone procured from Murgohi was the best, while the kunkur lime, though very good, was of second quality; the Murgohi lime is in fact a slow setting cement, as it will not slake after calcination, but when ground up into fine powder and mixed with two parts of soorkee it becomes very hard in a fortnight when immersed in water. The difficulties at first experienced in procuring good and trustworthy mortar for the river works have now been overcome.

Sasseram Division.

1. *Western Main Canal.*—Most satisfactory progress has been made in the earthwork, and particularly in the heavy cutting at the head of the canal. A strong force of men has been kept at this work all through the season, and it was expected that, with the exception of the first mile, which had been reserved for the convicts, there would be but little left to be done in the first five miles by the time the rains set in.

The foundation pits of the bridges, No. 1 (for the Rotas Road), No. 3 (Nasreegunge Road), and No. 4 (Arrah Road) had been excavated; that for No. 2 (Grand Trunk Road) was in progress. A sandy substratum having been met with at Nos. 1, 2, and 3, it was decided to substitute well foundations, sunk with the "Fouracres' Excavator," for the solid masonry at first designed. At the other two bridges there is a clay foundation; no alteration was therefore made in the plan. Masonry was commenced in Nos. 1 and 3 bridges, and the foundations of all were expected to be laid so as to allow of masonry in the superstructure being carried on during the rainy season.

Great difficulty and trouble were experienced at the syphon at the Kao Nullah at the ninth mile of the canal, owing to the water bearing sandy substratum which had been reached 7 feet above the bottom of the foundation: four steam pumps of large size were continually at work, but it was as much as could be done even with their assistance to keep down the water

and get in the foundation. To facilitate operations and enable an early commencement to be made, square blocks of masonry, 4 feet high, were built close together over about one quarter of the space; these were intended to be sunk with the "Excavator," and filled, inside and between, with concrete. The rest of the foundation was intended to be laid solid. A large stock of building materials had been collected, so that as soon as the excavation was out a vigorous commencement of the masonry might be made. The excavation, to save pumping, was being taken out in strips of about 50 feet in width.

Materials were collected for the inlets and escapes, but no work was done to them.

2. *Forest operations and Roads.*—Fifteen thousand cubic feet of sál and 20,000 cubic feet of other good and useful timber were felled during the year and partly converted into scantling in the Palamow Forests; and 71 miles of new road were constructed to facilitate its conveyance, but none had been brought in. There are no carts in the district through which the new road runs, and though it abounds with cattle the people have not as yet made any attempts to train them for draught. The cart owners at Dehree also hesitate to go into an unknown and jungly country. Such are the difficulties always encountered at first on any new line of road, but they will doubtless soon be overcome.

3. *Quarries at Kurondea.*—Seventy-five thousand cubic feet of ashlar stone and 130,000 cubic feet of rubble had been prepared at the quarries at Kurondea principally for the Kao Syphon. A tramway had also been laid down temporarily for a distance of 6 miles to carry the stone to the site of the works. It was found necessary to make this arrangement for the carriage of the stone, as the quantity to be conveyed is so large, and much of the ashlar so heavy, that carts could not be found in sufficient number or sufficiently strong to transport it.

4. *Jail Buildings.*—The construction and repair of the jail buildings, which (owing to their temporary nature and unfinished state at the time the last monsoon set in) had suffered severely during the rains, were made over to the Medical Department to complete: and as the prisoners were apparently all engaged on the construction of the huts and enclosing wall, none were sent out to the works during the last dry season.

Baroon Division.

1. *Earthwork, Eastern Main Canal.*—Only 8 miles of the Eastern Main Canal as far as the Poon-Poon, were in hand at the end of the year, sanction to the aqueduct across the river having been withheld pending the decision as to the extent of country beyond to which canal water is to supplied. It has since been decided to postpone the execution of the canal beyond the Poon-Poon, so that the aqueduct will not be constructed at present. But little remained to be done to complete the excavation of the first 8 miles of canal to 50 feet width of base. The progress made may be considered satisfactory, particularly in the first and second miles, where the cutting had to be made in the hardest description of clay, varying from 20 to 30 feet in depth.

The diverted drainage channel near Baroon and the skew three arched-culvert carrying the Grand Trunk Road over it were satisfactorily completed.

It was found necessary to construct three inlets at different points in the second and third miles in order to drain the country between the Sone and the canal. These works were expected to be completed before the rains.

The Assistant Engineer's bungalow at Jummoo near the Poon-Poon was accidentally burnt down, but has since been re-built.

Workshop Division.

1. *The new Workshop Buildings.*—The new workshop buildings were commenced in August last, and were almost complete at the end of the year. The progress made was excellent. No attempt at ornamentation has been made, the object being to provide substantial, roomy, and lofty buildings at the least possible expense. All the buildings, it was expected, would be covered in before the rains, and the machinery and smith's forges fixed in place.

2. *Vertical Saw.*—The vertical Saw, working for some months past in the permanent building, has given great satisfaction, the cost having been reduced from Rs. 3-2 per 100 square feet by manual labor to Rs. 1-8, showing a saving of Rs. 1-10 per 100 square feet. Another advantage is that the planks sawn by this machine are turned out so true and fair that but little has to be done to them by the carpenters afterwards.

3. *Machinery.*—All the machinery sent out from England was delivered at Dehree, and with but trifling loss: it was a matter of much difficulty to convey the heavy machines, and particularly the punching and rivetting machines, which weighed 5 and 7 tons, over the kutcha roads of this district. The machinery is the best of its kind, and has given entire satisfaction.

Surveys.

1. *Levelling operations.*—The cross levelling of the country west of the Sone extending as far as Chunar was completed. The Buxar Canal and the Western Main Canal to the River Gurgo near Chunar were staked out. A detailed survey and section of the Eastern Canal to the Morhur was also finished. All the main distributaries from the Arrah Canal were laid out on the ground. The above work represents 1,600 miles of cross levels west of the Sone and 142 miles on the east run within the season; also 130 miles of main navigation canal and 116 miles of distributaries marked out and surveyed to the west of the Sone, and 45 to the east.

2. *Preparation of Plans and Estimates.*—The whole of the detailed plans and estimates for the Arrah and Patna Canals, and the Western Main Canal to the Kurumnassa, were prepared during the past year and submitted to Government. The plans and estimates for the Buxar Canal and for the Western Canal between the Kurumnassa and Chunar were under preparation.

The sections and field-work of the Eastern Canal to the Morhur and of all the distributaries from the Arrah Canal were being plotted at the close of the year.

(B.)—ORDINARY.

Gunduck Division.

1. *Embankments.*—The whole of the work in this division, including establishment, is charged to "tuccavee" account. The embankments of the Gunduck were maintained in most efficient order, and the remodelling, which was undertaken two years ago, was almost completed.

The main embankments on the Sarun side of the river are 95 miles in length, and on the Tirhoot side 45 miles. In the whole of this distance not one breach occurred during the last floods, though they were unusually high and lasted unusually long; and it is no exaggeration to say that if the remodelling of the embankments had not been done, both districts of Tirhoot and Sarun would have been subjected to destructive inundations of long duration.

2. *River protective works.*—Great care was bestowed on the river protective works, and any serious erosion at once checked; special attention was paid to the two most dangerous points,—Bamdowlee and Lallgunge,—and the action of the current was jealously watched. All spurs and groynes were carefully repaired, and unless some unforeseen change occurs in the course of the stream, the Superintending Engineer thinks that no fear need be entertained for the safety of the embankments.

3. *Project for navigation and irrigation from the Gunduck.*—The plans and estimates for the scheme of navigation and irrigation from the Gunduck in Chumparun were almost complete at the close of the year. They have since been received in the Chief Engineer's Office.

IV.—LOWER GANGES INVESTIGATION.

This investigation has been completed, and the plans, estimates, and report have been received by the Chief Engineer.

In the early part of the year a detailed survey of the Hooghly River in the neighbourhood of Santipore was completed, and the site of the terminal lock fixed.

Owing to changes which had taken place in the course of the Ganges near the head of the Bhaugiruttee, the original design for crossing that river had to be altered, and an alternative line was run 20 miles lower down, south of Jungipore. The drainage channels from Sickergully ridge to where they join the Bhaugiruttee were carefully surveyed and levelled, and local information regarding the inundation tracts was collected.

A survey of both banks of the Ganges between Sahibgunge and Caragola, as well as the levelling of the left bank, was also completed.

Towards the close of 1870 the establishment was engaged in completing the plans and estimates of the project.

V.—HOOGHLY DRAINAGE.

From the Report of the Commissioner of Burdwan on the plans and estimates for draining the Dancoonee Swamp west of Serampore, it appeared that there was no probability of the formation of a voluntary association of landholders to carry out the scheme, and hence it became necessary to resort to special legislation for the purpose. A Bill was accordingly introduced into the Lieutenant-Governor's Council, which received the assent of His Excellency the Governor General on the 10th May last. The estimates have been sanctioned by the Government of India, and the work will be undertaken as soon as arrangements have been made for carrying out the provisions of the law (Act V. of 1871).

The 15th September 1871.

F. T. HAIG, *Lieut.-Col., R. E.,*
Offg. Chief Engineer, Bengal,
Irrigation Branch.

From COLONEL C. H. DICKENS, R. A., Secretary to the Government of India, Public Works Department, to the Joint Secretary to the Government of Bengal in the Public Works Department, Irrigation Branch,—
No 643 I, dated Simla, the 26th October 1871.

I AM directed to acknowledge the receipt of your letter No. 479 I of the 18th ultimo, submitting the Chief Engineer's progress report of irrigation and other agricultural works in Bengal for the year 1870-71.

2. In reply I am to convey the satisfaction of the Governor General in Council at the amount of progress which has been made on the works. But it is observed that, while under the head Extraordinary forty lakhs were granted, only 24 were spent. This is apparently due rather to the grant being too large than to any deficiency of progress, and shews that greater care should be exercised in framing the budget estimates for that class of works. It will render these reports more uniform and complete if the Chief Engineer, in future reviews, [illegible] with the sums allotted for the principal items, and where any difference occurs, explain the causes.

3. It is satisfactory to observe from the present report that the canals are being so much used for navigation, but there is apparently some mistake in the figures representing the tonnage on the Kendrapara Canal, as from the returns published monthly in the *Calcutta Gazette* the traffic along that canal appears to have been just short of 50,000 tons, instead of only 37,399 tons as entered in this report.

4. The reduction of the cost of carriage by native boats to the rate of 4·5 pies per ton per mile is satisfactory, but further reduction should be looked for.

5. The progress on the Soane works has also been satisfactory, and His Excellency has not failed to notice that the laying of the foundation blocks of the weir have been greatly facilitated and accelerated by the use of Mr. Fouracre's ingenious invention.

6. It is gratifying to learn that the remodelling of the embankments on the River Gunduck has proved so successful, that in a length of 140 miles not one breach occurred during the last floods, though they were unusually high and lasted unusually long. This is highly satisfactory; and His Excellency trusts the Government of

Bengal will be able to arrange for the completion of these useful and necessary works for the other Districts which are yet unprotected and exposed to the floods of that river.

7. In connection with the Hooghly drainage (on which no work appears to have yet been commenced) it is understood that a Bill has been passed through His Honor the Lieutenant-Governor's Council, and His Excellency in Council would be glad to know what steps have been taken to carry out its provisions.

8. This report will be printed in the *Gazette of India*, and a copy forwarded to Her Majesty's Secretary of State.

Preliminary scheme of irrigation from the Swat River in the Peshawur District.

From LIEUTENANT-COLONEL J. CROFTON, R. E., Joint Secretary to the Government of the Punjab, Public Works Department, Irrigation Branch, to the Secretary to the Government of India, Public Works Department,—No. 29 I., dated Murree, the 23rd September 1871.

WITH reference to a minute by the late Lieutenant-Governor Sir Henry Durand, regarding irrigation from the Swat River in the Peshawur Valley, forwarded to the Government of India from the Civil Department in December last, I am desired to forward, for consideration and early orders, a preliminary report by the Chief Engineer in this Department, on a project now being prepared, with the view, if further prosecution of the scheme be deemed advisable, that no time may be lost in re-commencing field operations as early as possible in the ensuing cold weather.

2. I am to add that His Honor considers the scheme, so far as can be judged from the report now submitted, a promising one, and would recommend the prosecution of investigations, as suggested in the report.

PRELIMINARY REPORT.

SWAT RIVER PROJECT.

Peshawur District.

Orders and arrangements made in consequence.—The orders for commencing surveys for this project were conveyed in No. 762, dated 3rd December 1870, from the Secretary to the Punjab Government, Civil Department, enclosing a copy of a minute by the late Sir Henry Durand containing his conclusions after marching through this portion of the Peshawur Valley, which was also transmitted to the Government of India. In this minute His Honor directed that application should be made for the necessary funds and establishment. This however was found to be unnecessary, as just at that time the preliminary operations, connected with the Western Jumna Canal projects having nearly come to a close, there were officers available for the work, and a sufficient balance in the ordinary budget grant to meet the contingent expense of the survey.

Three officers were accordingly detached towards the middle of January last from the Special Survey Division on the Western Jumna Canal. Mr. A Fenner, as Executive Engineer in charge of the projected survey, with Messrs. Bullock and Jones as assistants. Though late in the season to commence work, it seemed to me to be possible to collect sufficient data on which to base a sketch project and estimates which would show whether it were worth while to undertake the scheme. Though the results have not as yet been completely worked out, I have put together the following notes with the view of showing approximately what may be expected, so that if it appears worth while to continue the investigations and elaborate a working scheme with fully detailed estimates, the orders may be issued so that no time may be lost in re-commencing operations in the field as soon after the 1st November next as possible.

2. *Remarks on Lieutenant Governor's Minute.*—Before going into the detail of the scheme a few remarks are necessary on some of the points touched on in the minute above alluded to

1st.—It is observed in the 3rd paragraph that the head works might be so situated that water could, if required, be taken off at both sides of the river. About this it

now appears there is no option, as the tract, locally termed the Doaba, between the Swat and Cabul rivers is now irrigated from the former, as will be shown elsewhere, to the extent of nearly half its available area, besides a large area in the low land of the Hushtnuggur pergunnah, or the left bank; and although the quantity it is now proposed to take off for the irrigation of the highland, will not nearly exhaust the available balance in the river, yet the subtraction of so large a volume would indubitably lower the surface of the stream below and so render it difficult, if not impossible, in many cases to supply the existing cuts from their present heads. Provision must, therefore, be made to continue the supply to this irrigation from above the proposed dam.

2nd.—In the 5th paragraph the limits of the proposed scheme are stated to be the westward portion of the Eusufzaye plain, and on a subsequent reference His Honor fixed the Kulpanee Nullah flowing past Hotee Murdan as the boundary at least for the present. The survey operations have therefore been confined to the high land lying between this and the edge of the Swat River Valley.

3rd.—As directed in the 3rd paragraph I proceeded in March last to inspect the locality near the debouche of the river from the hills and the large hill torrents, alluded to in the 7th paragraph.

4th.—In the 15th paragraph allusion is made to the possibility of inducing the villagers to work themselves at the excavation.

This, I fear, will be found quite impracticable. I was informed by the district officers and others will acquainted with the localities and the people, that the cultivators are generally averse to such labor; that even for the periodical clearances of their small irrigation cuts, they prefer waiting till men from beyond the border come down in the cold weather, whom they *pay* to execute the work for them.

3. *Tract to be irrigated.*—The tract to be supplied with water is shown on the accompanying tracing, bounded by the hills on the north, the edge of the valley of the Lundaee or Cabul river on the south, to the east by the Kalpanee, and to the west by the edge of the high banks of the Swat River Valley. The highest point on which water can be delivered, it will be seen from the levels on the map, is opposite the Tukht-i-Bace Hill, north of Murdan. South of this and of the blue line marking the projected course of the main supply channel, the total area, excluding the nullahs, amounts to 141,706 acres: of this probably not more than one-third would require irrigation in the khurreef season. In the Doaba alongside the total culturable area, as given by the Revenue Survey, amounts to 54,272 acres, of which 26,641 acres, or nearly one-half, are irrigated, but the area entered as "irrigated" in these returns is generally much in excess of that under cultivation at any one time. For the purpose of this project, I have assumed that only two-thirds of the latter area requires water in the same season. The khurreef or autumn crop is usually very much larger than the rubbee or spring crop, nearly double by the revenue returns, probably from the greater facility in getting water.

4. *Population.*—As to the population now in the tract to be irrigated, I have no certain data.

The average number per square mile throughout the Peshawar Valley is stated in the Provincial Revenue Report for 1868-69 to be 271, but in the tract which will be affected by this project, the number is considerably less. The civil officers however are of opinion that there will be no lack of cultivators for all the land which can be irrigated, as there are numbers of men of the hill tribes over the border who would only be too glad of the opportunity of taking up the cultivation as tenants of the villagers who own the lands, which will be brought under the influence of the irrigation.

5. *Details from Settlement Officers.*—From the settlement officers the following details have been obtained:

Revenue rates for the whole Valley—

	Per acre. Rs. A. P.
Cultivated	0 15 5
Culturable, including latety abandoned	0 14 8
On total area	0 7 5

The "mairah" and high land out of reach of any irrigation, except that from rain, was not assessed at last settlement.

In the tract between the Swat River and the Kulpanee—

	Acres.
The total area is	351,792
Cultivated	212,590
Culturable	71,779
Unculturable	67,424

Of the cultivated area, 24,105 acres are irrigated by cuts from rivers, 3,799 acres from wells. The above includes the khadir or low land in the valley of the Swat River, which will not come within the influence of the present project. All arrangements for irrigation are made, and the expenses defrayed by the cultivators themselves. A temporary bund, shown on the small map, has long existed for the supply of the upper channels in the Doaba, and those about Abuzaee on the left bank. This is in general carried away in high floods.

6. *Rain-fall.*—In the meteorological report of the Punjab for 1870, the rain-fall at Peshawur for the last four years is given as below:

	Inches.
1867...	7·9
1868...	11·7
1869...	15·3
1870..	8·5

This shows of itself the necessity for artificial irrigation.

7. *Supply of water available.*—As to the supply of water available from the Swat River. The river commences rising usually about the 15th March, and attains its full height about middle of May, though this has been known to occur as early as April, and as late as June. The fall commences about the 15th or end of July. Measurements of the discharge taken by Mr. Fenner give the following results:

	Cubic feet per second.	Greatest depth of water.
1. On the 18th February 1871	2,970 ...	9·0
2. „ 11th April „	3,681 ...	9·93
3. „ 18th „ „	22,486 ...	14·36

The first discharge was measured when the river was about at its lowest. The height of water at the time of taking the third measurement was within 3·25 feet of the highest known flood mark. Calculating from this the increase in section and velocity, the

Discharge in *the highest flood* is ... ... 30,582 cubic feet per second,
With greatest depth of ... ... 17·61 feet,

which gives the difference between lowest and highest water mark as 8·61 feet.

Now, if we assume the whole of the irrigated land in the Doaba and Hushtnuggur to require water at the same time, and taking 60 acres as the duty of one cubic foot of water per second, we find as follows:

	Acres.
Area irrigated in Doaba	26,641
„ in Hushtnuggur	16,915
Total ...	43,556

and $\frac{43556}{\cdot 60} = 725{\cdot}9$ cubic feet per second, the very largest quantity which can possibly be required; and, as I have mentioned above, these areas are probably much in excess of what would require water in the same season.

The supply available for new irrigation when the river is at its lowest is, therefore (2,970—726) = 2,244 cubic feet per second.

The probable effect of the subtraction of the canal supply on the Lundaee, or Cabul River, below its junction with the Swat River, has not been taken into consideration, as the former is much the larger stream of the two.

8. *Supply required.*—As to the quantity of water required in the present scheme. The total irrigable area, as stated above in paragraph 3, amounts to 141,706 acres, of which I think we may assume that not more than one-third, or 47,235 acres, will require water at the same time. The discharge at the head of the canal should, therefore, be $\frac{47235}{60} = 787$ cubic feet constant,—800 cubic feet has been assumed as the discharge required.

9. *Site for head-works.*—The site for the head-works has been fixed with reference to the levels of the land to be irrigated, the highest portion of which I have stated above lies opposite the Takht-i-Baee Hill, the levels of the large nullahs to be crossed, and thirdly, the supply of water to the Doaba.

If the water be taken off below the junction of the two large nullahs,—the Nawadun and the Jinda,—in the low land of the river valley by which aqueducts across them would be avoided, the levels show that a considerable portion of the plain south of the Takht-i-Baee would be deprived of irrigation.

If the site be anywhere between this and the fort of Abuzaee, there would be great difficulties in crossing those nullahs, besides entailing a considerable length of heavy embankment.

If, above Abuzaee, the line must be carried as shown on the map to the north of the low hills above the village of Tungi, and the level at which it is necessary to carry the canal across the nullahs there determines the lowest position on the river at which the head-works can be constructed. One of the points indicated in the Lieutenant-Governor's minute is a little distance above the site fixed on; but as the hills on the right bank there rise nearly perpendicularly from the river, it would be impossible to lead a supply channel thence for the Doaba.

10. *General scheme.*—The general scheme then comprises a dam across the river at the site shown—a main supply channel thence in the direction marked by the blue line till it reaches the plain in which the Takht-i-Baee is situated. The country, it will be observed, from the Jinda Nullah, eastward, is cut up into portions by well-defined nullahs, some of which are of considerable size and depth. Separate channels, as sketched out by the blue-dotted lines, are proposed for each portion, drawing their supply from the main channel. All, except three or four of these, are mere rajbuhas, some of very small size, but the cost will be comparatively high, owing to the very great declivity in the surface of the ground. The annexed *tabular statement* shows the proposed capacity and the actual fall which must be overcome in each case. The velocity which the soil will stand, and consequently the declivity which may be given to the channels, has not yet been ascertained, but the irrigation channels in the Doaba will give a very good idea of it; as the soil, however, is very stiff in most places, it is probable that the sections of channel will be much smaller than are required elsewhere for the delivery of equal volumes of water.

The discharge of each distributary has been calculated according to the area irrigable by each, taking one-third as the area requiring water at the same time, and assuming that one cubic foot per second will irrigate 60 acres.

11. *Details of head-works.*—The section of the river at the proposed site of the dam is shown on the small tracing. The actual width of surface in highest known flood is 420 feet; but as the river widens out immediately below, and the declivity of the bed is so great (*vide* the longitudinal section), I have projected the total length of the dam at 500 feet. The details are similar to those of the dam constructed across the Ravee at Madhopoor (which has successfully resisted the action of the extraordinary floods of this season) and the proposed dam across the Jumna at the heads of the Eastern and Western Jumna Canals. The bed is here composed of large boulders beneath which, so far as can be ascertained without actual excavation, a substratum of rock or conglomerate exists. The draw-back to this site is the existence of a long and steep rapid immediately below; as, however, the temporary bund shewn on the plan has been constructed for many years past on this very site, it may be assumed that the bed is tolerably stable.

Six feet is the depth of water required to supply the canal, so that the crest of the dam need not be raised above the present surface of water in the river at low supply. This the calculations show will cause very little, if any, heading up in the highest floods.

Little or no embanking will be required above the dam, the banks of the river being high at this point.

A regulating head is projected for the canal and another for the supply channel to the Doab on the right flank. The supply for the existing Hushtnuggur irrigation would be given from the canal channel, somewhere near the fort of Abuzaee.

12. *Main Channel.*—The nullah crossing close to the head, though the quantity of water in it at any time is small, brings down quantities of boulders, earth, and other debris. It seems best, therefore, not to cross it on the level, if possible. The canal is, therefore, projected to pass under it. The extrados of the super-passage will be above the present level of the bed; but as the river is so close, there is no risk of dangerous erosion by the water falling over the drop thus caused. The only objection to this course is the possibility of conglomerate being found in the bed, which would increase the cost of the excavation. This, of course, would be ascertained before drawing up a working plan.

No falls will be required on this main channel.

Two aqueducts of considerable size will be required for the Nawadun and Jinda Nullahs, and several culverts for minor drainages. It may be found, and I think will, that some of these may be blocked up altogether by the canal embankments, as the fall of rain is never very great, and the area of their catchment basins is insignificant. Storage reservoirs would thus probably be formed, which are much wanted in this parched land.

Only one bridge is estimated for on the direct communication between the plains and the Swat country, there is no traffic apparently there which ferries elsewhere will not amply provide for. One of the latter is estimated for at intervals of about two miles.

The excavation near the head will probably be in stiff soil, and some of it is deep; this has been estimated at Rs. 12 per 1,000 cubic feet, the remainder at Rs. 3 per 1,000.

13. *Distribution.*—The distributaries have been estimated for by mileage rates, as there was not time to carry levels along the probable course of each. The rates are taken from actual cost of similar channels on the Baree Doab Canal in the upper portion of the Doab, where the declivity of the surface of the ground was considerable.

14. *Channel to supply existing irrigation.*—A channel, 10 miles in length, is estimated for the Doaba supply, assuming that only two-thirds of the total recorded irrigated area, requires water at the same time.

For the Hushtnuggur supply, the channel will probably not exceed one mile in length but a masonry fall will be required in it to drop the water into the channels in the khadir, or low land of the river valley.

15. *Escape head.*—One escape head is estimated for on the main channel by which surplus water may be passed off into one of the ravines ending in the Swat River. The exact position cannot be determined without a closer examination of the localities.

16. *Land Compensation.*—Compensation for land. The greater portion of the land traversed by the proposed channels has little value at present. The land taken up for a grass preserve for the guide corps amounted to 1,200 acres, for which Rs. 12,500 was paid, or about Rs. 10 per acre, but this was low land, irrigable from a nullah in the vicinity. It is considered that Rs. 5 per acre should be about a fair average for the high land. I have entered it at Rs. 6; and for the channels to supply the existing irrigation, the rate is set down at Rs. 40 per acre, as those channels will mostly lie through cultivation.

17. *Expenditure and returns.*—The rough estimate of total cost of the project is appended with notes on the data used in its compilation.

The total, including contingencies and establishment, comes to Rs. 14,71,025.

In estimating the income I have assumed that the khurreef crops will easily be able to pay Rs. 2½ per acre, and the rubbee crops Rs. 2 per acre, and that one cubic foot per second will irrigate 60 acres in the khurreef, double that, or 120 acres, in the rubbee.

The maintenance charge for cubic foot of supply is taken from the results on the Eastern Jumna Canal, 1867-68, which average Rs. 152. The result thus obtained is—

	Acres		Rs.	Rs.
Khurreef	47,235	@ 2·5	1,18,087	
Rubbee	94,470	@ 2	1,88,940	
				3,07,027
Deduct maintenance, at Rs. 150 per cubic foot on 787 cubic feet ...			...	1,18,050
Net balance ...				1,88,977

or a profit of 12·84 per cent. on the capital outlay. The calculations are, I think, based on tolerably safe data, and in the returns I have not included any charge on irrigation in the Doaba and low land of Hushtnuggur, which should, undoubtedly, contribute some thing, in consideration of their being relieved from the expense of maintaining bunds on the Swat River, and supply heads direct from the river, which are always, as in the inundation canals elsewhere in the province, a constant source of expenditure of labor; and, in addition, that irrigation will be obtainable for the rubbee crops which is seldom the case, or to a very small extent, I believe, at present.

18. *Navigation not provided for.*—No provision has been made for navigation in the projected channels.

On the main channel there would be no difficulty, but on the smaller channels, owing to the excessive rate of declivity, it would add very largely to the cost.

19. *Detailed report under preparation; reason for submitting this abstract.*—A fully detailed report and designs and estimates in as great detail as the data already collected will admit of, are now under preparation, and will, I hope, be ready for submission in November. I submit this brief sketch of what is projected now, in order that if, as it appears to me, the project is likely to prove a really advantageous scheme, orders may be issued with as little delay as possible, so that no time may be lost in re-commencing operations in the valley, at the commencement of the cold weather.* Mr. Fenner and the officers with him deserve every credit for the work they have got through in so short a time, only about two and-a-half months; but it will be sufficiently apparent from the map that it is not an easy country to carry irrigation through economically, and a much closer investigation of it, and longer consideration are necessary before the working details can be decided on with confidence.

* It is also, I think, worth considering whether the possibility of extending irrigation to the lands on the east of the Kalpanee should not be investigated, since there is more water in the river than is required for the present project.

20. *Political advantages of the scheme.*—As to the political advantages of the scheme I have heard but one opinion expressed by every one conversant with the localities, that even if the financial results were *nil*, the money would be well expended in inducing large numbers of the predatory tribes on that wild frontier to take to agriculture, and that in British territory. The people themselves everywhere were eager for the commencement of the works.

J. CROFTON, *Lieut.-Col., R. E.,*
Chief Engr., Irrigation Works, Punjab.

Data on which rough estimate is based.

1. EXCAVATION calculated from section on line shewn on plan.

2. *Channel for Doaba.*—One-third of the area irrigated supposed to require water at the same time. This gives $(\frac{1}{3} \times 26641) = 17{\cdot}761$ acres, and at 60 acres per cubic foot discharge required $=293$ cubic feet per second. If velocity be 2·5 feet per second, the required area of water section $=\frac{293}{2{\cdot}5} = 117$—channel 25 feet at bottom, slopes 1 to 1, water 4 feet deep.

Hushtnuggur Channel for old irrigation calculated as for Doaba. Total irrigated area being 16,915 acres—22 feet wide at bottom, slopes 1 to 1, water 3 feet deep.

3. Dam from estimate for Jumna dam, which gives $\frac{190138}{2000}$ = Rs. 95 per foot run of body of dam. Regulator for Eastern Jumna Canal of 60 feet waterway, Rs. 21,427.

4. *Supper-passage Jumna Work.*—Cost per running foot of canal water-way taken from cost of drainage passages on Lahore Branch, Baree Doab Canal.

5. *Aqueducts.*—Cost per foot run taken from estimate for aqueduct on Western Jumna Canal lately drawn up.

6. *Culverts.*—Cost per foot run from section of masonry required.

7. *Escape head with fall into escape.*—Cost per foot run taken from an estimate drawn up for the Sirhind Canal.

8. *Rajbuha heads.*—On Baree Doab Canal, cost for ordinary rajbuhas was Rs. 2,300 each. I have taken Rs. 3,000 for the largest distributaries, Rs. 2,000 for all the rest, many of which are very small.

9. *Rajbuha Channels, including masonry works.*—Cost per mile taken from cost of similar rajbuhas on the Baree Doab Canal.

10. *Road Bridge.*—Cost per foot run taken from Baree Doab Canal.

11. *Returns.*—Cost of maintenance on Eastern Jumna Canal in 1867-68, averaged Rs. 0·775 per acre irrigated, or Rs. 152 per cubic foot per second of average discharge.

ROUGH ESTIMATE, SWAT RIVER PROJECT.

Excavation.

Main channel—				
84,567,096 cubic feet, at Rs. 3·5 per 1,000 ..	...	...	2,95,984	
Extra rate for excavation near head—				
6,308,567 cubic feet at Rs. 8·5 per 1,000 ..	...	...	53,622	
Channels to supply existing irrigation Doaba—				
$10 \times 5280 \times 30 \times 5 = 7{,}920{,}000$ at Rs. 3 per 1,000	...	...	23,760	
Hushtnuggur—				
$1 \times 5280 \times 26 \times 4 = 549{,}120$ at Rs. 3 per 1,000	...	...	1,647	
				3,75,013

			3,75,013
	Masonry Works.		
Dam on Swat River—			
Body 500 square feet at Rs. 100 per foot ...	50,000		
Regulating bridges ditto ...	30,000		
		80,000	
Super-passage Lundaee Nullah, 45 square feet, at Rs. 900 per foot		40,500	
Drainage inlet, Abuzaee, No. 1		1,200	
Ditto ditto No. 2		1,200	
Aqueduct Nawadun Nullah, 300 square feet, at Rs. 500 per foot ...		1,50,000	
Ditto Jinda Nullah		1,50,000	
12 feet culvert, 126 square feet, at Rs. 50 per foot		6,300	
Bridge 45 square feet water-way, at Rs. 250 per foot		11,250	
24 feet culvert, Kunda Nullah, 126 square feet, at Rs. 100 per foot		12,600	
35 feet culvert, Hissara Kara Nullah, 126 square feet, at Rs. 130 per foot		16,380	
24 feet culvert, Narain Nullah		12,600	
Escape Head, 24 square feet, at Rs. 810 per foot		19,440	
8 Ferries, including boats, at Rs. 1,000 each		8,000	
Branch Head for Nos. 8 and 9 Rajbuha		6,000	
Rajbuha Head No. 6		3,000	
Ditto No. 7, at Rs. 2,000		14,000	
Head Hushtnuggur Channel		3,000	
Fall in ditto		5,000	
2 1st class chowkies with out-offices, at Rs. 5,500 each ...		11,000	
1 2nd ditto ditto ...		3,000	
12 Chowkeedars' chowkies, at Rs. 600 each		7,200	
			5,61,670
	Rajbuhas.		
1st Class, above 100 cubic feet, 30·5 miles, at Rs. 4,000 per mile		1,22,000	
2nd Class, between 30 and 100 cubic feet, 46·21 miles, at Rs. 1,600 per mile		73,936	
3rd Class, all below 44·45 miles, at Rs. 1,000 per mile		44,450	
			2,40,386
Total			11,77,069
Contingencies at 10 per cent.			1,17,707
Total			12,94,776
Establishment at 12 per cent.			1,55,373
Total			14,50,149
	Land Compensation.		
		Acres.	
Main Channel 18·6 miles long, width 400 feet		753	
1st Class Rajbuhas, above 80 cubic feet, 41·61 miles long, width 150 feet		756	
2nd Class Rajbuhas, 80 cubic feet and under 79·65 miles long, width 66 feet		637	
Total ...		2,146	
Doaba Channel 10 miles long, width 150 feet		182	
Hushtnuggur Channel, 1 mile long, width 150 feet .. .		18	
Total ...		200	
2146 acres at Rs. 6 per acre		12,876	
200 do. Rs. 40 do.		8,000	
			20,876
Grand Total			14,71,025

	Estimated Income.		
Khureef 47,235 acres at Rs. 2·5 per acre		1,18,087	
Rubbee 94,470 „ at „ 2·0 „		1,88,940	
			3,07,027
D. D Maintenance—			
787 cubic feet at Rs. 150 per cubic foot			1,18,050
Net balance			1,88,977

Or 12·84 per cent. on the outlay.

J. CROFTON, *Lieut.-Col.*, R. E.,
Chief Engineer, Irrigation Works, Punjab.

N. B.—A considerable proportion, if not the whole, of the masonry works will be constructed of stone, which is found at no great distance.

Tabular statement of distribution of water, &c.

Channel.	Distance from head.	Acres. Total area.	Acres. Irrigable area.	Cubic feet per second. Expenditure.	Cubic feet per second. Required capacity.	Cubic feet per second. Actual capacity.	Feet. Bottom width of channel.	Feet. Total fall in channel.
	Miles.							
Main Channel	...	...	...	...	800	...	35·4	...
to Rajbuha No. 3 ...	...	9·2	...	...	780	...	35·4	...
„ „ „ 4 ...	...	11·7	...	30	750	757	35·4	...
„ „ „ 5 ...	...	13·8	...	28	729	729	33·8	...
„ „ „ 6 ...	...	15	...	79	722	643	22·75	...
„ „ „ 7 ...	...	16·9	...	221	643	650	22·75	...
„ „ „ 8 ...	...	18·6	...	46	422	429	22·75	...
„ „	...	...	...	...	376	383	...	...
Rajbuha No. 8 } Branch head	...	...	...	...	233	234	...	...
„ „ 9 }	...	5·0	566	188	143	144	...	...
Rajbuha (Abuzaee) ...	...	2·46	893	298	13	...	...	...
„ No. 1 ...	...	1·55	491	165	5	...	...	53
„ „ 2 ...	...	5·20	1,656	552	3	...	...	49·5
„ „ 3 ...	...	3·46	2,123	807	9	...	...	117
„ for same head ...	...	9·39	5,035	1,678	13	...	...	74
„ No. 4 ...	...	6·43	14,181	4,727	28	...	...	235
„ „ 5 ...	...	3·67	3,116	1,038	79	...	...	167
„ „ 6 ...	...	11·11	17,218	5,739	221	...	...	51
1st Branch	...	9·75	14,531	4,843	95	...	...	187
2nd „	...	8·3	5,171	1,724	81	...	...	135
3rd „	...	2·89	8,288	2,763	28	...	...	124
Rajbuha No. 7 ...	...	3·31	4,597	1,532	16	...	...	13
„ „ 8 ...	...	6·02	4,515	1,505	24	233	...	...
1st Branch	...	9·37	13,467	4,489	25	135	...	...
2nd „	...	6·66	14,147	4,816	74	74	...	...
3rd „	...	9·09	5,281	1,760	...	80	...	...
Rajbuha No. 9 ...	...	17·5	25,827	8,609	...	30	...	...
						143	...	...
								64
								11
								186

From COLONEL C. H. DICKENS, B. A., Secretary to the Government of India, Public Works Department, to the Joint Secretary to the Government of the Punjab, Public Works Department,—No. 619 I., dated the 23rd October 1871.

I AM instructed to acknowledge the receipt of your letter No. 29 I. of the 23rd ultimo, submitting, for consideration and early orders, a preliminary report by the Chief Engineer of Irrigation on a project for irrigation from the Swat River in the Peshawur District, and in reply to state that the Governor General in Council is glad to find from this report that the scheme promises so well.

2. It is impossible to overestimate the advantage of placing 1,41,000 acres of Eusufzaie territory under cultivation and turning its semi-savage people into peaceful husbandmen; and His Excellency in Council, therefore, has no hesitation in sanctioning the prosecution of the further investigations proposed, and the preparation of the detailed project.

3. The design, as far as it has been prepared at present, seems to be quite correct; but I am to request that when the detailed scheme is being prepared, proper enquiries may be made by the revenue authorities as to the probable rates of return, and complete and reliable information obtained and afforded in this respect, when the project is submitted for sanction. In paragraph 5 of Colonel Crofton's report, it is said that, according to the settlement officer's statements, the revenue rates for the whole outlay are—

	Rs.	A.	P.	
For cultivated land	... 0	15	5	per acre.
„ culturable, including lately abandoned	... 0	14	8	„
On total area	... 0	7	5	„

But if these represent the land revenue rates at present obtained, it seems to the Government of India doubtful whether the people will readily consent to pay Rs. 2-8 per acre for water; and the civil officers should, therefore, be consulted in the matter.

4. The papers will be published as a supplement to the *India Gazette*.

5. The plans and map received with the letter replied to are herewith returned, and 80 printed copies of the report will shortly be forwarded to the Government of the Punjab for its proceedings.

No. 43 of 1871.



SUPPLEMENT TO

The Gazette of India.

SIMLA, SATURDAY, NOVEMBER 11, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

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GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

Experiments made at the Shameerpett Tank, in His Highness the Nizam's Dominions, to ascertain the quantity of water required for the irrigation of rice crops.

Subject of quantity of water required for crops first ordered.

THIS enquiry was first commenced under orders of the Government of India conveyed in their Circular No. 87 of 1867. The Commissioners in Berar were requested to endeavour to ascertain by experiments and furnish the information required, but no satisfactory results were attained.

Why Shameerpett Tank was selected.

2. In a letter No. 222-I., dated 31st May 1870, from the Government of India, it was suggested that, with the concurrence of the Nizam's Government, experiments should be made from the Hoossain Saugor Tank at Secunderabad, and permission was solicited from Sir Salar Jung, the Nizam's Minister. This was readily granted, but at the same time the Minister pointed out the difficulties that would be experienced in connection with that tank on account of the numerous purposes for which the water was used in consequence of the largely populated area which was cultivated therefrom, and suggested that the experiments should be made from some other tanks in the neighbourhood, mentioning that at Shameerpett.

Situation of tank and season selected for commencing the experiment.

3. This tank is situated about nine miles from Bolarum, (14 from Secunderabad,) and early in December last, I visited it in company with the Executive Engineer of the Division, Assistant Engineer Mr. Little to whom the Surveys were entrusted, and Mr. Condasawmy Moodeliar on the part of His Highness's Government. The season selected for commencing work was at the time the cultivation of the second rice crops in the Deccan commences.

4. The tank is one of the fine old specimens found in India. It was constructed about 200 years ago at the same time as the Hoossain Saugor Tank was built, but it has been allowed to fall somewhat into decay; and has not, I understand, been fully utilized in the memory of living man. The collecting basin above it is about 75 square miles. When full the depth of water at bund would be about 40 feet, the area covered by the water would be about 1,375 acres. The depth of water when full over sill of lower sluice would be 35 feet, and the capacity up to 24 feet above our datum amounts to 943,700,000 cubic feet, or 34,951,852 cubic yards, enough to irrigate 3,500 acres at the rate deduced from this experiment. Taking the average rain-fall of 26 inches, and ·8 as co-efficient of discharge, the possible collection from the whole basin would be 154 millions of cubic yards, but as there are 32 other tanks of sizes above the Shameerpett Tank, it is probable that the full capacity of the latter would never be utilized. The breadth of bund at top varies from 38 to 50 feet. The outer slope is about 2 to 1. The inner slope faced with coursed stone is generally nearly perpendicular, but in places half to one.

Description of tank.

5. The sluices are of the common native pattern built on the inner slope of the bund in three stages, all faced with cut stone, with steps leading down to the lowest sluice. This arrangement, though no doubt expensive, simplifies the difficulty of dealing with sluices under great heads of water.

Description of sluices.

In each stage two circular holes (10″ diameter) are cut vertically and communicate with a common masonry tunnel leading right through the bund. These tunnels are laid in the solid ground one at either end of the bund. The holes are fitted with large beams of wood passing through openings in the platform above, which are raised according to the quantity of water to be discharged. By this arrangement never more than 10 feet head of water has to be dealt with. The timber used is of a wood called khyr or khyer, a species of babool, and weighs about 70 lbs. to the cubic foot. The Botanical name is Mimosa Catechu, or Acacia Catechu.

6. These sluices with ever varying heads and discharging the water under such peculiar circumstances rendered it impossible to make any reliable calculations as to daily discharge from tank, and after a few attempts the idea of measuring the water used by this means was abandoned.

Difficulty in calculating discharge from sluices.

7. The irrigation commenced in the last week of November, and the level of the water in the tank at that time was taken as the standard level or datum for our calculations.

Date of commencement of irrigation

8. In consequence of the orders of Sir Salar Jung, every assistance was afforded to us in obtaining all the information we required.

Assistance afforded by Sir Salar Jung.

9. The plan adopted was very simple. The tank was surveyed accurately, a contour line being run round the level of the water as it stood at the end of November, and other six feet contours were run above that level, in case the water should have risen from any extraordinary causes, such as heavy rain-fall, or bursting of reservoirs on higher level, and also to enable the full capacity of the tank to be calculated.

Mode of calculating the quantity of water used.

At the same time the water was traced from the tank to the different portions of land under rice cultivation, each of which was accurately surveyed. Originally these were reported by the villages to be about 100 begahs, or 75 acres, but they were proved to amount to 280·28 acres.

When the irrigation was completed, the tank was surveyed below the datum level, and so the *gross* quantity of water that left the tank could be pretty accurately calculated, and this after all is the important object to ascertain, as wherever reservoirs exist evaporation and soakage always dispose of a large quantity of water; and this tank may, from my experience of several thousands in the Madras Presidency, be taken as an average specimen. The bed of the tank is generally of a rocky nature, so no excess soakage took place.

10. Any heavy rain-falls would have rendered our calculations more difficult, but fortunately from the middle of November to the end of May, the only falls at Secunderabad, which may be accepted for Shameerpett, were as per margin, so all calculations on that account may be left out without affecting the results in any material degree.

Experiment made under satisfactory circumstances.

Week ending	3rd March	...	·28
„	10th „	...	·2
„	14th April	...	·7
„	21st „	...	·29
„	3rd May	...	·4
			1·87

When the experiments were commenced, a very petty stream was found by Lieutenant Little to be running into the tank, but so small that he could with difficulty measure it, and so I have neglected also to notice that.

11. By way of arriving at some conclusions as to the *net* quantity of water required, we made arrangements for measuring the evaporation from the tank. On this subject I have never before succeeded in arriving at any satisfactory conclusion.

Experiment on evaporation.

I have evaporated water from pans and from pans standing in other pans, but I always felt the results were excessive, and that the evaporation from a large body of water was considerably less than that shown from pans owing to the whole atmosphere immediately over the surface of the tank being moist. On the present occasion I ordered a water-tight tin box to be constructed, and sunk it in a timber raft, so that it might float with its edge slightly above tank water level. The box was then filled to tank water level, and the whole floated out a considerable distance from the shore, so that the water in the box was placed almost in exactly similar circumstances as the water in the tank.

On two occasions careful measurements were taken of the evaporation during the previous fortnight, other attempts were made but frequently some trifle happened to render the measurements valueless.

Between the 12th and 26th of January (14 days), the evaporation amounted to 2·12 inches or ·1514 of an inch per diem. Between the 27th January to the 10th February (15 days,) the evaporation amounted to 2·67 inches, or ·178 of an inch per diem. Mean evaporation ·165 of an inch per diem, and this with the colder weather of December, and the hotter weather of March and April may be taken as a fair mean.

Period of irrigation.

12. The number of days during which irrigation was going on were 185.

Fall of water in tank.

13. The water in the tank fell 11·07 feet.

Results gross quantity of water consumed.

14. The results may be summed up as follows:

Gross quantity of water consumed	...	...	...	2,531,750 cubic yards.
Area irrigated ...	...	...	...	280·25 acres.

During the period of cultivation no rain fell worthy of notice.

Gross quantity of water consumed per acre 9,042 cubic yards. The crop was, it is understood, an average one.

It is worthy of notice that the season not being a very favourable one, the water was husbanded and little or none wasted. Latterly it had to be raised by hand labour, the level of water falling below [illegible]

The cultivators had complete control over the water.

15. The evaporation represented a depth of water in the tank of 30·5 inches; soakage cannot be determined, but for sake of calculations we may reasonably assume it to be the same as the evaporation, and allowing an average area of water, the loss would have been 1,162,577 cubic yards. This would leave 1,369,173 cubic yards as the approximate net quantity of water spread over the land, and which over 280·25 acres gives 4,890 cubic yards per acre, and represents a depth of 36·3 inches.

Calculations as to net quantity of water used.

16. These calculations made under exceptionally favourable circumstances, and with great care agree, I think, somewhat with calculations made in other Provinces. I believe from 7,000 to 10,000 cubic yards of water per acre, in the gross, are generally consumed for rice from tank irrigation, and a rain-fall of 36 to 40 inches fairly distributed over a season is, I believe, sufficient to produce an average rice crop, without any artificial irrigation.

Results as compared with other Provinces probably correct.

The survey and measurements were undertaken by Assistant Engineer, Lieutenant Little, under the orders of Lieutenant Cumming, R. E., Executive Engineer, Secunderabad Division; and have, I believe, been made with great care and correctness.

The climate here is a dry one, and the general level of the country is about 1,800 feet above sea level. These are points that should be noted in comparing the results with experiments made in other Districts.

17. The total cost of the experiment was very trifling, or about Rs. 300.

Cost of experiment.

J. O. MAYNE, *Major*, R. E.,
Superintending Engineer,
Hyderabad, P. W. Department.

SUPERINTENDING ENGINEER'S OFFICE;
BOLARUM,
The 27th September 1871.

From the Government of India, Public Works Department, to the Resident at Hyderabad,—No. 650 I, dated the 28th October 1871.

I AM directed to acknowledge the receipt of your Secretary's letter No. 269 of the 23rd instant, submitting, for information, a memorandum by the Superintending Engineer, on experiments made at the Shameerpett Tank in His Highness the Nizam's dominions, to ascertain the actual quantity of water required for the irrigation of rice crops.

2. In reply, I am to state that the experiments seem to have been carefully conducted, and afford at all events a *practical* result as showing the *gross* amount of water that was actually expended on a given area in the cultivation of a particular crop, *viz.*, rice.

3. I am to request that the thanks of the Government of India may be conveyed to Major Mayne and the officers engaged in the experiments, and also to Sir Salar Jung for the assistance rendered by His Highness the Nizam's Government in the matter.

4. The papers will be circulated for general information, and published as a supplement to the *Gazette of India*.

Revenue Report, Irrigation Department, North-Western Provinces for 1868-69.

Resolution by the Government of India, Public Works Department,—No. 625-41 I., dated Simla, the 26th October 1871.

READ the above Report and Resolution of Government, North-Western Provinces, No. 1177 I. of 17th April 1871, reviewing the same.

OBSERVATIONS.—The importance to which the irrigation works in Upper India have attained is made evident by those in the North-Western Provinces alone furnishing during the year a gross revenue of nearly £315,000 and an expenditure of £240,000, making the entire annual transactions upwards of half a million sterling, while the area actually irrigated amounted to a little short of 1½ million of acres, the gross value of whose outturn cannot, it is estimated, have been less than 5 millions sterling exclusive of the fodder by which the cattle were sustained.—*(Vide table on margin.)*

	Acres irrigated.	Maunds produced.	Value at current market rates in pounds sterling.
			£
Sugar ...	97,553	2,009,329	1,056,385
Wheat ...	597,936	7,916,186	2,635,505
Barley ...	257,509	2,680,006	486,250
Rice ...	111,020	1,142,152	387,146
Maize ...	42,122	358,547	82,699
Millet ...	93,369	690,693	170,108
Pulses ...	73,354	601,574	173,532
	1,272,862	15,393,487	4,991,625

2. The year under review was a very favorable one for the canals, or, in the language of the Government of the North-Western Provinces, "the financial results of the year display an unexampled prosperity." There were 1,441,898 acres irrigated against 983,390 acres of the highest previous year's maximum, a gross revenue of Rs. 31,47,160 against Rs. 21,74,431, and a net revenue of Rs. 21,25,424 against Rs. 12,25,539 of the best preceding year. The profits amounted to 8·21 per cent. on a total capital of Rs. 2,58,73,080 invested up to 31st March 1868 in all the irrigation undertakings of the North-Western Provinces, good, bad or indifferent. These satisfactory results have already been acknowledged by the Government of India, as well as by Her Majesty's Government.

3. The year was characterized by wide-spread scarcity, the mitigation of which in all the districts within reach of the irrigated tracts was very sensibly felt, and the areas under irrigation and their situation relatively with the neighbouring districts is clearly delineated on the map which is embodied with the report, and wherein it is observed—"The irrigated tracts of the Doab were

the heart of the province from which surplus food flowed out by the railways westward to the Cis-Sutlej States, in which there was no harvest to reap, and southward by never ending trains of camels and carts to Bundelkhund, Ajmere, and Rajpootana, where no grain was even sown. Under Providence a famine was averted by the combined action of railways and canals."

Page 46. Para. 83.

4. His Honor the Lieutenant-Governor records an observation to the effect that the failing supply of the Jumna renders a reconnoisance of storage sites in the Himalayas advisable, and specifies the River Tonse as presenting favorable conditions at certain points of its course. This is an important matter especially in connection with the proposed extensions of the Western Jumna Canal in the Punjab.

5. The results of the working of the two chief canals during three years are already shown in the present report. The ratio of cost of revenue management to gross revenue on the Ganges Canal was 14·79 per cent., and nearly corresponds with that of the Eastern Jumna, which is the best organized of the canals in the North-Western Provinces.

6. The areas irrigated by the several canals in the three last years were as follows:

YEAR.	Ganges Canal.	East Jumna.	Doon.	Other Canals.	TOTAL.
1866-67 ...	634,734	239,559	8,852	100,249	983,390
1867-68 ...	533,456	182,544	11,988	33,492	761,480
1868-69 ...	1,078,399	274,101	14,223	75,195	1,441,918

The whole area irrigated is 11¼ per cent., about one-ninth of the gross cultivated area of the districts traversed.

7. The proportions of "flow" and "lift" irrigation over all the canals were—

1868-69	...	...	Flow	69·4	Lift	30·6
1867-68	...	...	„	68·0	„	32·0

and show that to still one-third of the whole area the water has to be raised.

8. *Ganges Canal.*—The following table compares the results of the three last years:

YEARS.	CAPITAL AT BEGINNING OF EACH YEAR.	PROFITS FROM DIRECT INCOME ONLY.	
		Amount.	Percentage on capital.
	Rs.	Rs.	
1866-67	2,48,06,303	12,25,539	4·94
1867-68	2,52,35,918	8,67,806	3·44
1868-69	2,58,73,056	21,25,828	8·21

and the next exhibits the income and working expenses for the same year of the Ganges and Eastern Jumna Canals, the only important working lines as yet completed:

Ganges Canal.

Year.	Gross revenue.	Revenue management.	Maintenance charges.	Total working expenses.	Percentage on gross revenue.	Revenue: Per cubic foot of discharge.	Revenue: Per mile of canal.	Revenue: Per mile of rajbuha open.	Revenue: Per acre irrigated.	Working expenses: Per cubic foot of discharge.	Working expenses: Per mile of canal.	Working expenses: Per mile of rajbuha open.	Working expenses: Per acre irrigated.	Percentage of profit on capital sunk.
	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.		Rs.	Rs.	Rs.		
1866-67	15,33,729	2,55,342	5,08,535	7,63,877	49·78	374	2,367	505	2·416	186	1,179	251	1·208	3·50
1867-68	13,63,524	2,90,993	5,28,690	8,19,683	60·11	390	2,085	448	2·556	234	1,253	270	1·536	2·44
1868-69	24,41,559	3,61,349	4,32,873	7,94,222	32·51	525	3,733	785	2·264	171	1,214	255	0·736	7·22

Eastern Jumna Canals.

1866-67	5,57,368	65,444	56,113	1,21,657	21·82	522	4,287	935	2·327	114	936	204	0·508	24·87
1867-68	4,83,147	72,370	69,093	1,41,463	29·27	519	3,716	811	2·647	152	1,088	237	0·775	18·92
1868-69	6,25,450	82,515	71,539	1,54,054	24·62	663	4,811	980	2·281	163	1,185	242	0·562	25·87

9. The succeeding table shows the cost of establishment, including accounts, employed during 1868-69, on original works, repairs and revenue, and the percentage chargeable under each heading:

Share of Establishment. Chargeable to	Executive.	Direction.	Total cost of establishment on each.	Expenditure.	Percentage on each.
	Rs.	Rs.	Rs.	Rs.	
Original works	2,29,116	31,741	2,60,857	9,77,462	26·68
Repairs and plantations	59,097	12,377	71,474	4,35,386 assessments.	16·42
Revenue management, including navigation	4,04,229	83,967	4,88,196	31,47,161	15·51
	6,92,442	1,28,085	8,20,527	45,60,009	18·00

10. The working expenses on the Ganges Canal, which had hitherto been so large owing to the great expansion of irrigation during 1868-69, were reduced from 49·78 to 32·51 per cent. on gross revenue; but on the Eastern Jumna Canal little room remained for expansion, and, consequently, the working expenses only fell from 29·27 to 24·62. The conclusion drawn from thence is "that 25 per cent. about represents the working expenses of a fully developed and thoroughly efficient canal conducted on the North-West system." An instructive table is added, in which the increase of irrigation is contrasted with the decrease in rain-fall. The percentage of the former varies from 28 in the Agra Division to 142 in Boolundshuhur, while the percentage of the rain-fall varied from 30 inches in Bareilly to 67 in Etawah. The relative decrease of rain in Agra and Boolundshuhur differed only as 48·5 and 54·5 per cent.

11. The following table illustrates the areas irrigated relatively in the two seasons of khurreef and rubbee, showing, not only how large a part was performed in the former season compared with that of previous years, but how much further a cubic foot of water was made to go—a fact which reflects great credit to the officers charged with the distribution of the water:

Ganges Canal.

Year.		Area irrigated.	Area irrigated. Total.	Per cubic foot of supply.	Total water-rate.
1866-67	Khurreef	181,658	...	41·37	512,373
	Rubbee	453,076	634,734	103·55	893,660
1867-68	Khurreef	185,137	...	42·66	562,926
	Rubbee	348,319	533,456	98·39	675,564
1868-69	Khurreef	344,267	...	69·63	814,631
	Rubbee	734,132	1,078,399	148·01	1,450,689

12. A question is raised by Major Brownlow as to the capacity to be given to canals in the North-Western Provinces in relation to the volumes available for the irrigation of the rubbee crop, and the advisability of supplying the plough waterings to the full extent of the volume available, as he considers that it was a speculative [illegible] to distribute the 6,000 cubic feet available for [illegible] October, when the volume of the canal fell in January to 4,200 cubic feet. The remarks made by Colonel Greathed with reference to this point in paragraphs 33 and 34 are much to the point, and seem, at all events, to be borne out by the successful issue of the season's operations.

13. The following shows the areas of some of the principal crops irrigated as compared with that of previous years, and that there is a steady moderate extension in the cultivation of sugar-cane and rice, a two-fold increase in the rubbee grains, while the area under indigo remains stationary:

	1864-65.	1865-66.	1866-67.	1867-68.	1868-69.
Rice	22,466	23,134	30,539	36,365	43,355
Sugar	50,159	58,416	46,338	55,232	60,654
Indigo	35,166	47,714	70,487	75,684	75,506
Cotton	42,026	10,496	19,094	5,616	44,213
Wheat and barley... ...	338.071	362,679	400,444	319,715	699,582

14. *Navigation.*—The receipts from navigation, which is confined to the Ganges Canal, have increased 10·3 per cent.; but, according to the statement, the articles carried have increased from 27,000 to 45,600 tons. This quantity is, however, still very small compared with the length of the canals opened, *viz.*, 654 miles. In proportion, however, as obstacles are removed and greater facilities are offered, the traffic along the canal and its branches will doubtless increase.

Eastern Jumna Canal.

15. The extension of area on this canal was but 13,000 acres over the maximum previously reached in 1860-61, but it has now been so carefully worked for so many years that, as observed by the Chief Engineer, little margin remains for expansion. The profit on this canal for the year under review is said to have amounted to 25·37 per cent. on the capital, *vide paragraph* 53 *of the Report*. But though the absolute increase of area over that irrigated in the famine year of 1860-61 was only to the extent stated, yet the supply of water on the average throughout the year was less, and the duty obtained per cubic foot of discharge was the largest yet recorded, being 90·7 in the khurreef and 215·5 in the rubbee, or 306 acres in all. That one noticeable fact has received confirmation during this year's experience seems evident from the following remarks made by the Superintending Engineer, 2nd Circle, in paragraph 28 of his report: "that the contract system is one in which the interests of the cultivator are identical with that of the Government in the economical distribution of water, is fully borne out by this year's results."

Doon Canals.

16. These small canals do not improve much in their character as remunerative works, and the Superintending Engineer does not seem to anticipate much further improvement; but, at the same time, his remarks in paragraph 14 of the report are much to the purpose. He observes as follows: "That the good done to a country by canals is not to be measured merely by the canal balance sheet, applies with two-fold force to the Doon Canals: a population has settled along these lines of irrigation dependent entirely on them, not only for water for their crops, but for water for domestic purposes. Close the Beejapoor Canal, and, in two years' time land, now producing tea and cereals, will be overgrown with jungle."

Jhansie, Humeerpoor, and Bijnour Irrigation Works.

17. These yield but an insignificant amount of revenue, and call for no particular remarks.

Rohilkhund Canals.

18. These canals are working at a loss, chiefly on account of the exceedingly low water-rate charged. A revision of these rates has been proposed by the North-Western Provinces Government, and is now under consideration by the Government of India. The area irrigated amounted to 70,803 acres, or 2½ times as much as in the previous year. The increase was due to the prevailing drought, only 19·4 inches of rain having fallen during the year. The necessity for these canals is made apparent by the fact that rice forms so large a proportion of the cultivation. In the previous year the percentages of rice and wheat were 56 and 27, respectively, and during the year under review 40 and 36 per cent. A project was recently before the Government of India for remodelling these canals as well as raising the water-rates, and the Chief Engineer's opinion is that, seeing "the amount of deficit occasioned by ceasing to charge water-rate on canal water from natural streams has decreased from Rs. 27,169 to Rs. 4,947, there is every reason to push on the re-construction of these works."

19. Section 6 of the Chief Engineer's report contains an interesting review of the effect of the drought in directing attention to the irrigation of the inferior food grains, nearly 77 per cent. of the total increased area consisting of "*joar*" and Indian corn, the stalks and leaves of both of which serve as food for cattle, while the grain is consumed by human beings.

20. The following remarks by Colonel Greathed graphically and significantly describe the superior effects of canal irrigation in the North-Western Provinces as compared with that afforded by wells:

"But, besides producing food for the support of human life, canal irrigation created sustenance for cattle, which was produceable by no other means, and, at a crisis when wells failed in well-irrigated districts, and herbage and fodder depended on abundant water, the cattle of the Doab were saved, strong to labor in the work of the following harvests, whilst elsewhere those

harvests also were reduced by the want of cattle which had been swept off by the drought."

* * * * * *

"And, lastly, canal cultivators became rich whilst others suffered because they realized both large crops and high prices: the payment of land revenue was assured, the breaking up of communities, the unsettlement of the social system of the country, the loss and dispersion of property, which famine entails, were averted, and a vast sacrifice of life prevented which, but for the extension of canal irrigation, must have occurred in 1868-69, as it had occurred in the same districts in 1837-38. I trust these results may be pondered by those who recommend dependance on the irrigation to be obtained from wells in a year of serious drought."

21. The amount of relief afforded by special irrigation works undertaken during the time of greatest pressure extended to upwards of two millions people and an outlay of Rs. 4,31,185.

22. The only unsatisfactory matter is the delay in the submission of the report. His Excellency in Council also would have been pleased if something more had been said as to the efforts which it is believed are being made to check the waste of water which takes place over the wide districts and which it is understood forms one of the greatest agricultural difficulties in the North-Western Provinces.

Order.—Ordered, that copies of this Resolution and of the papers above read, be forwarded to the Secretary of State, the Department of Agriculture, Revenue and Commerce, and the Financial Department for information.

Ordered also that copies of the Resolution be sent to the Government of the North-Western Provinces and the several other Local Governments and Administrations in the Public Works Department, Irrigation Branch, for information, and that the Resolution be further published in the Supplement to the *Gazette of India*.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Establishment of Model Farms in Districts.

Demi-official from A. O. Hume, Esq., C. B., Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce, to Local Governments and Administrations,—dated Simla, the 2nd November 1871.

I am directed to forward, demi-officially, for consideration and for private distribution to all revenue and other officers who are interested in such matters, copies of a brief note drawn up by the Secretary to Government in this Department on the subject of agricultural reform.

2. It must be distinctly understood that the Government of India at present neither accepts nor negatives the proposals and conclusions embodied in this note. The object in circulating it, is to obtain, demi-officially, the freest possible expression of opinion from all officials interested in such subjects, both as to the means which this note suggests, and as to any other means which their experience may lead them to recommend, for improving and developing the agriculture of the empire.

3. This note probably possesses little claim to originality, and is unquestionably very imperfect; but it may yet serve as a nucleus round which much valuable information and many useful suggestions may readily crystallize.

AGRICULTURAL REFORM.

Although it would occupy some considerable time and space were I to attempt to elaborate the details of the scheme I advocate, a very few words will suffice to convey some idea of the project.

I must premise that my first contention, derived from my personal experience, is that large farms intelligently managed will, even in this country, after the first two or three years,

cover all their expenses and give fair interest on any capital employed. Further, that this will be the case where land has to be rented from private proprietors, and that *à fortiori* this will be the case, where the land belongs to Government, and is either unassessed or only liable to the moderate jumma that Government imposes.

The farms must be of considerable size,—not less certainly than 1,000 acres,—or they will not pay from their profits the cost of supervision which, if the scheme is to possess any real vitality, must be of a high order.

Briefly, what I contemplate is at least one large Government model farm in every district of the country, where all existing staples shall be grown, at first in the most approved local native fashion, and year by year on improved and ever-improving systems, and from seeds year by year improved by selection, and, where necessary, by interchange with other similar farms; where cattle, sheep, and poultry breeding shall be cautiously, but perseveringly, carried on, and where locally unknown staples and breeds should be gradually introduced, acclimatized, and popularized. The whole of these farms should be closely connected with each other. Their supervisors encouraged not only to vie with each other in results, but to visit and communicate with each other in the freest manner possible. Liberal prizes should be offered for those supervisors who made their farms pay best, and, besides this, provincial exhibitions should be held with numerous prizes for excellence of produce, whether agricultural or animal, equally open to the farms and to the agricultural population generally. A special Agricultural Journal would be started for the record of all done at these farms, all experiments, all failures, all successes, so that all might know what all were doing and so profit mutually by each other's experience.

With due care in the selection of the men to begin with, it would be impossible under such a system but what some man possessed in an eminent degree of all the capacities requisite for the development of agriculture, should be evolved, and real and important progress effected.

Directly it became, on the whole, an acknowledged fact amongst the people of any district (and the people have eyes as well as we have, and can appreciate good crops and better methods of tillage just as well as we can when they *see* them) that their model farm was really growing better crops, or growing crops similar to their own, cheaper, or breeding better stock, or turning out better seed than they were themselves able to do, sons of well-to-do cultivators, peasant-proprietors, and the like, who concern themselves personally with practical agriculture, should be allowed and invited to reside at the farm, and familiarize themselves with the system there followed, and the methods of caring for the stock there bred. All that showed capacity and intelligence and deserved it should be furnished, at cost price, with improved seed or stock to start with on their own lands.

Each farm should, in fact, become at once a practical school of agriculture and a source of supply of improved "matériel," whether vegetable or animal.

This is not an Utopian idea, it is susceptible of being carried into practice, if we only act boldly and judiciously and on a sufficiently large scale. Nor is it sufficient to assert that it will repay indirectly many fold the expenditure incurred: my contention is that in the long run it will directly and fully repay its own expenses.

The great difficulty, it will be said, will consist in obtaining supervisors, and at *first* starting this is unquestionably *the* rock upon which the adventure would be most in danger of shipwreck.

But it must not be supposed that I contemplate starting all these farms at once. I would select a single division, of say six districts, and in this start six farms. To each supervisor I would give two, three, or four apprentices, intelligent youths, country-born English, Eurasian, Native, some of whom would, probably, become in time qualified to take charge of farms in other districts, under the supervision of their trainers, who, as time went on, could manage, especially near lines of railway, two or even three farms each. I would also, from time to time, bring out young men of a higher class, who, after a year or so training, acquisition of the Native languages, &c., would be competent to assume independent charge of farms, and undertake the training of apprentices, &c. Thus the scheme would grow and spread until the whole province was covered. Doubtless, once it was fairly started in one province and established as a success in a single division of that province, other provinces would desire to make a similar commencement. Some fresh men would have to be got out from Europe, some would be spared from the first province in which the scheme was started, so that in ten or twelve years we might hope to have covered the whole Empire.

But still the selection of the first men will be a most difficult matter. We require not merely a certain amount of scientific agricultural training, not merely a certain amount of practical knowledge as farmer and stock-breeder, but a strong healthy physical frame, energy, and industry, and a mind so far generally cultivated that it shall be capable of adapting itself to new combinations of circumstances, of applying its experiences to these, and thinking out for itself the new problems that will inevitably arise.

Some such men *are* to be met with and might be enlisted in our service if we paid them fairly to begin with, made them clearly understand that their promotion or increase of salary depended on their success, and held out to them the certainty of a considerable share in any net profits realized when once their farm had cleared itself of debt.

It must be borne in mind that I base my hopes of success on the large scale of my proposed operations. Many of our men would, doubtless, turn out average good creatures incapable of *originating* any important step of progress; but, with a number, carefully selected to begin with, with emulation-prizes to gain, free inter-communication of experiences and ideas and prospects of solid rewards, it would be impossible that here and there some man suited exactly to the needs of the country should not be developed, and one such man in a province or in the Empire even would leaven the whole.

I do not expect to get such a man at once, but even after the two first years, we should very nearly pay our expenses, and by that time some one or other of the men, though not, perhaps, what we hope for ultimately, would be qualified to lead and guide, and year by year, with careful administration, the average results would improve.

Now about these men. The first thing I should set them down to do, would be to learn the language and the agriculture practised in the district in which they were to start their several farms, not to live fine-gentlemen-like in stations, but out in some agricultural village amongst the people.

They must, of course, be men young enough to rough it, unmarried, with the even tempers that so often accompany a well-organized physical frame, and with a fairly cultivated mind.

I would not let them start a farm of their own until they had thoroughly familiarized themselves with existing agriculture, and I would make them start their farms in general harmony with that system, with only such minor modifications (*e. g.*, improved supply of manure, &c.) as are patently desirable to every one who has ever engaged practically in the work, and as I said before each successive year should witness some cautiously-introduced improvement. As to the lands to be furnished for these farms, as a rule I would not hire them. There are in many districts villages, the property of the State, which for years past we have been almost recklessly selling by auction; here and there we might find some of these suited to our purposes, and in no way, perhaps, could our men begin better their apprenticeships than as resident managers of such properties, which they might begin to take into farm after the first year. In other places waste lands might be taken advantage of, and settlers brought thither to work on these by a system of inland emigration, which might help to secure, for the service of the Empire, the wealth that, in the form of working men, we are yearly lavishing on other colonies and foreign nations.

It will be said that after all the scheme promises but slow progress. That we are to wait a year for this, and another for that, and this is perfectly true; a measure like this must be slow to be sure. We have the *inertia* of past cycles to overcome, but once we turn the corner, once one single farm (especially with exceptional local advantages) begins to pay in earnest, the progress will be as rapid as any reasonable man who knows the people and the country could expect or hope for.

And now about funds. My idea is, that this scheme needs for its success the co-operation of both the Imperial and Local Governments. Of the gross expenses, a certain portion, say one-half, should be advanced as tuccavee by the State, to be recovered as a first charge from sale price of crops, &c. The other half should be contributed by local funds. The tuccavee repaid all profits (except such share as might be allotted to the supervisor) should belong to the Local Governments. Perhaps we might even go further and engage on behalf of the State to pay the salaries of the men we got out until they got regularly into work, say for a period of two years each.

There are even now, I believe, local Administrations which would accept these terms, and doubtless hereafter there will be many more.

This is, indeed, I feel a sketchy outline of the scheme that I should advocate, but it will, I hope, suffice to give His Excellency some conception of my ideas.

A. O. HUME.

The 25th August 1871.

Extract from the Proceedings of the Government of Fort St. George in the Revenue Department,—dated the 22nd September 1871.

READ the following papers:—

From the Acting Sub-Secretary to the Board of Revenue, to the Acting Secretary to Government, Revenue Department,—No. 5013, dated Madras, the 23rd July 1870.

I AM directed by the Board of Revenue to submit the report called for in the order of Government marginally noted, together with a file of replies from Collectors on the same subject, the last of which was only received on the 27th of May last.

No. 1728 of 17th June 1869.

2. With the despatch* to which the above Government order had reference, the Secretary of State transmitted the observations of Major-General Cotton on the experiments made with English agricultural implements that had been reported on, and observed, "considering the slow growth of public opinion in this country in regard to the use of machinery for agricultural purposes, I regard with satisfaction the experiment which has been made in Madras, where the difficulties from the prejudices, habits, and poverty of the people are so much greater than in England."

* Dated 28th October 1868.

3. General Cotton observes *in limine* "the first thing that strikes me in this respect is the hopelessness of attempting to do anything vigorously for the improvement of Indian agriculture, unless it is made the special duty of some one to look into the results of such trials as these; to see that the implements are skilfully used; to suggest modifications of them to suit the peculiar crops of the country, so unlike in many cases the crops they are prepared for in England; and to give immediate advice and help to those who venture to take them into use." He points out in the most forcible language how impossible it is for Collectors in this Presidency to devote much time and attention to the question, even if they have the necessary knowledge of the subject; and remarks with reference to the report of the Agent for Remounts at Oossoor that when improved agricultural implements are in the hands of those who are "actually engaged in farming, and who can look into their use, watch their working, and apply them judiciously to the work required, their success is complete."

4. General Cotton considers that the obstacle which the smallness of holdings and the poverty of the great bulk of the cultivators of Madras oppose to the more general use of machinery may be overcome by travelling machinery which would execute the various farming operations for hire. But he urges that "the introduction of the very simplest tools of better form than those now in use" is nevertheless likely to be productive of great economy of labour and improvement in culture.

5. General Cotton observes: "I have great confidence in the skill that can be acquired by natives of India * * They will use the tools given them with much more delicacy of hand * * than could be hoped for from the English ploughman, and we may take advantage of that in using lighter and cheaper tools, always provided that their first introduction is made under careful warning and instructions."

6. In his remarks on special implements General Cotton describes the superiority of the cultivator over any modification of the native plough for the purpose of Indian agriculture, and considers that the difficulty of finding "cattle strong enough to plough the soil to a sufficient depth in India is to be met at present by going over the ground more than once, by ploughing a moderate depth with one plough and following it by another. This, he observes, is one of the improvements specially needed in India, as it is of infinite importance that where the sun is so scorching as it is in the tropics, the roots of all plants should have as deep a bed as possible."

7. A winnowing machine, he thinks, might be set up in a village at small cost and could hardly fail to answer, and chaff-cutters should be established at cattle halting places, while travelling thrashing machines might gradually be introduced through the agency of wealthy proprietors. He considers the introduction of the rice-hulling machine "of great importance and worth any effort that can be made."

8. On the general subject of improvement of Indian agriculture, General Cotton makes the following impressive remarks: "In the present state of affairs, the *Government* must act if anything is to be done, there being no Agricultural Society to press improvements and too large a field for any but Government influence to reach at all;" and again, remarking on the slow and partial appreciation of any new efforts to economise agricultural labour and turn the soil to the best account in other countries, he observes, "if so in England * * what hope is there of India, unless the Government goes into the subject in all parts of the country, and makes the importance of it fully understood;" (lastly,) "the only question seems to be whether so much advantage can be derived from better treatment of the land and the economy of labour now wasted, as to justify the attempt on a larger scale; and no one who has looked into the result of what is called *high farming* in this country (England) can question this. We are every year more and more astonished with the yield of the land which really seems to have no limit."

9. On receipt of the order of Government, the Board called upon all Collectors to report, after due consideration, what measures they could suggest to attain the end in view; and in their replies above recorded they have submitted their own views and those of the various intelligent persons, European and Native, with whom they have been in communication.

10. The Principal Assistant Collector in charge of Vizagapatam thinks that neither the simple introduction nor exhibition of improved appliances is likely to lead to success. The Rajah of Vizianagram, he says, once experimented with the plough sent by Government, but nothing has been heard of the implement for three years. Mr. Sewell strongly advocates the plan recommended by a predecessor* in 1863, in the following terms:

From Principal Assistant in charge, dated 18th January 1870, No. 46.

* From Mr. Carmichael, dated 1st December 1863, No. 986.

"2. There is no doubt the art of agriculture in India is entirely empirical; in this as in other things, the natives of the country follow the traditions of their fathers in full faith and simplicity; but they are never slow to adopt changes which, recommend themselves to their interest in social and economical matters. Witness the improvement in the cultivation of cotton, of indigo, coffee, and many other products. I can conceive nothing more suited to foster and develope an improved system of agriculture than the institution of model farms in selected localities. But I apprehend that such undertakings should be superintended by practical farmers from England, men thoroughly acquainted with the whole system of crops, manures, and soil, and initiated, moreover, into chemistry and the cognate sciences. If left in the hands of amateurs, whether Collectors or Centurions, I look for nothing but failure and self-deception.

"3. To these farms should be attached as apprentices some of the best lads of the European and East Indian Orphanages. There are several Agricultural schools in England, where the training is both practical and scientific, and they are resorted to with the best results as well by those who intend to start in farming with their own capital, as by those who design to get their living as bailiffs, land agents, surveyors, and the like. I am confident that the demand for such qualified youths would far exceed the supply, both with planters and native landholders; and so by degrees the country farming would be raised into a science."

11. The Collector of Godavery observes: "It is not to be expected that any natives will purchase the machines and use them at their own expense, without a careful inspection and seeing them at work. Without knowledge how to work them, they will not introduce them;" and he suggests that if implements are sent for exhibition in the district they "should have persons competent to work them and explain their advantages."

From Collector, 25th January 1870, No. 17.

12. The Collector of Kistna reports that the impression amongst the agricultural population is that European agricultural implements are beyond [illegible] cattle. He adds, that there is no doubt whatever that an unfavourable impression has been created by sending implements up-country to be exhibited by unskilled workmen. The exhibitions have been failures, the implements have been broken, and their repairs on the spot have proved to be impossible. "This mode of exhibiting improvements in agricultural appliances is," he observes, "perfectly useless." The rice-hulling machine set up at Nedumole has been a failure, the lease has not been renewed. The Sub-Collector of the same district observes that even ryots who "are well-to-do have not the spirit of enterprize to purchase expensive machines, the uses and advantages of which are unknown to them, and the profits from which are problematical" in their eyes.

From Kistna, 17th November 1867, No. [illegible]

13. The Collector of Nellore states that all whom he had consulted, including the Dewan of the Rajah of Venkatagherry, agree that the first step in the matter of improved agricultural appliances must be taken by Government, "but express themselves willing to follow the example set by Government." An experienced agriculturist in the public service in that district proposes that to familiarize natives with these implements, "model farms under European superintendence should be established in each district."

Dated 11th November 1869, No. 2121.

14. The Sub-Collector of Cuddapah deems the establishment of a farm under a practical agriculturist the only mode of introducing improved agricultural appliances to the notice of the people; but the Collector doubts whether even then "the present generation would take example therefrom." The Sub-Collector observes, that the want of roads must long prove an obstacle to the introduction of travelling machines.

From Collector, 23rd September 1869, No. 169.

15. The Collector of Madras shows that "the result of holding agricultural exhibitions in creating a demand for improved agricultural implements has not hitherto been encouraging." He doubts, as several others do, whether while labour is cheap and plentiful, the use of costly and large agricultural machines is likely to be general; but thinks that persistent endeavours should still be made to introduce better tools than those now in use, especially at the Government Farm at Sydapet.

16. The Collector of North Arcot reports that the universal desire is to see the implements, etc., that the ryots may judge for themselves. Ploughs were distributed in 1866; but "owing to the price or some inadaptability to the requirements of the district they have not found acceptance." The Head Assistant remarks that when labour is so cheap and the number of poor employed in agriculture so large, "the introduction of machinery, *qua* releasing superfluous hands, will not be felt but rather denied." That "the richest puttah-holders never look at their fields, while the cleverest cultivators are the poorest labourers, and therefore are the most opposed to any innovation which might reduce their profits and save the money of their employers."

From North Arcot, 12th November 1869, No. 346.

17. The Collector of Tanjore observes, that most of the implements named by General Cotton, can, with great advantage, be introduced, in parts at least of Tanjore. "But," he adds, "the main difficulty lies in securing the requisite mechanical skill in handling and using these implements, by which alone fair results can be attained and the agricultural classes convinced of their actual utility and value in ensuring a saving of labour." The Head Assistant observes, that it is "indispensable that we should in the first introduction of ploughs, etc., take care that they are only entrusted to the handling of skilled labourers." Positive harm is caused "by bungling and failure at the outset." A large body of mirassidars in the district have expressed themselves ready to subscribe to get implements down, if the skilled labourers and trained cattle can be found to accompany them.

From the Collector of Tanjore, dated 31st January 1870, N. 33.

18. The Officiating Collector of Madura indents for three sets of implements "with persons qualified to use and keep them in order." He states that the ryots are unwilling to purchase any at present, but considers "that if an opportunity were afforded them of seeing some of the simpler implements properly worked, they are sufficiently intelligent and enterprizing to appreciate them, provided the work done in their presence shows conclusively that the implements exhibited are well calculated to economize labour and develope the resources of the land." Messrs. Yorke and Scott, two practical agriculturists, offer some excellent remarks on the kinds of ploughs and other implements required for this country.

Dated 1st Mach 1870, No. 64.

19. From Tinnevelly the reports are very full. The Collector says that the universal desire is to see by experiment that the agricultural implements, offered are more effective than those in use. The zemindars, he says, will adopt no change "unless it be forcibly demonstrated that the purchase would pay." He therefore strongly advocates "the establishment of a model farm; fully convinced that nothing will really ever be done by making desultory experiments here and there over the country, such experiments being conducted often by men who really understand very little about what they profess to teach." He recommends that a farm be opened in connection with the jail under the superintendence of Dr. Thompson, the Superintendent.

From Collector, 4th April 1870, No. 138.

20. The Acting Sub-Collector likewise deprecates "random trials here and there" of improved implements, and urges the establishment of a model farm in each district, remarking that the Government would probably be glad to instruct the ryots about many matters "connected with farming, such as rotation of crops, growing special crops for the sole use of cattle, the use and value of wells and manure in high farming small areas of dry land; all points which the natives require to learn a good deal from us about." But to do so, or to secure the adoption of improved implements of husbandry or methods of agriculture, successful results "must be systematically and persistently worked out before the people."

21. In a very useful letter, Dr. Thompson, the Superintendent of Jail, deprecates the promiscuous transmission of new agricultural implements into the district, but urges measures being adopted to introduce improved methods of cultivation and to instruct natives in all branches of improved agriculture. He instances many serious and wasteful defects in the existing native methods of husbandry in respect to the cultivation, both of rice and dry land, which would be remedied by instruction and by observation of the principles and practice of improved husbandry. He urges "the systematic formation of farms at each district head quarter station," in which the rearing of live-stock should be combined with tillage, and he considers that, with time and care, such farms should turn out self-supporting and remunerative. He would attach one to each jail, and considers that municipalities also should establish model farms.

Paragraphs 45 and 46.

22. The Commissioner of the Hills, reporting after the close of his Agricultural Exhibition, states: "I see little prospect of the introduction of modern machinery and improved methods of agriculture until a farm has been established by Government, whereon natives could watch the working of better implements, and could see the result of improved modes of culture in the standing crops." He observes that "there is scarcely a province in Prussia

which has not its State model farm," that "agricultural institutions are in other countries maintained or aided by the State," and that "with a view to satisfactory progress in the general improvement of agriculture in the Presidency, the State must be prepared to step in and take the initiative by the establishment of practical farms." Mr. Breeks describes the miserable deficiencies in agriculture on the hills, notwithstanding great capabilities, and he places on record a memorandum by Lord Tweeddale and one by Mr. Veterinary Surgeon Thacker on the subject of breeding cattle, and adds, "no attempt to introduce modern agricultural appliances or to improve the breed of cattle will meet with real success, until the Government take the matter in hand and secure the services of a practical agriculturist to show the way as suggested by His Lordship." Lord Tweeddale is of opinion that, "it is of the greatest consequence that everything should be well considered and carried out profitably, before Natives or Europeans are invited to follow the example set by Government."

23. The Collector of South Canara states that the cultivators of that district are thoroughly alive to their own interests and ready to take advantage of useful implements, but that it is necessary that they should be exhibited before them in full work to enable them to judge of the advantage of using them. He thinks that the casual exhibitions hitherto tried are soon forgotten and fail to convince, and suggests that acquaintance with mechanics and the principles of agriculture might be made part of the curriculum of study necessary to obtain employment in the Revenue Department of the public service. Mr. Pfleiderer, to whom the Board are much indebted for his interesting communication, after noticing various defects in agricultural processes now sufficiently obvious and their remedies, remarks—"but such improvements, if they shall be effective, ought to be demonstrated *ad oculos*, and not merely by pamphlets and publications. A Government farm in each district, under intelligent supervisors and carried on on enlightened principles, might indeed be a great blessing, and would be certain to lead to a gradual but sure development of the country and its resources in every respect. Simple importation of foreign agricultural implements is not enough. They must be adapted to the requirements of the soil, climate, cattle, and people; it must be demonstrated by real use how to be used with advantage, how to be treated, and to be kept up."

From Collector, 4th February 1870, No. 118.

24. The Collector of Malabar remarks—"The more wealthy agriculturists would go to the expense of providing themselves with improved implements were they satisfied of the advantages to be derived." And Mr. Logan considers that they are quite as ready to do so as the people of England. He notices the waste of manure, the indifferent ploughing, etc., and considers that the value of improved agriculture must be demonstrated to the people by actual experiment. In his opinion, what is required is some institution where the people may be taught by actual experiment the many methods and the use of the many machines and implements employed in agriculture. "It is foolish," he adds, "to suppose that the methods and implements in use elsewhere will be equally well adapted to this country; but the people, if properly used, could contribute very largely to the practical working out of the questions that would arise simply by criticizing where methods and implements in use elsewhere are practically experimented with in India. What is required is a school to which, at least at first, all classes should have free access."

From Collector, 13th September 1869, No. 241.

25. Thus from every quarter, and with the authority of all best qualified to judge, there is an almost unanimous opinion and desire that attention should now be seriously given to raising the status of agriculture in this country, to promoting its efficiency, and to giving a vigorous impetus to the improvement and study of practical farming. The Board believe that this cannot be done without the interposition of Government.

26. The advantages to be derived from a scientific knowledge of agriculture in a country where three-fourths of the people live directly thereby and the public revenues are mainly dependant thereon, cannot be denied or exaggerated, however existing shortcomings may be excused and excellencies in the traditional methods of culture admitted. In this matter, as in any other great system of popular education, it is necessary, at least at first, that the Government should intervene, and by their example enlist the sympathy of the zemindars and the well-to-do landholders, through whom improved systems may gradually be transmitted to the lower classes of the proprietary and tenantry. There are no doubt many who only need encouragement to take up agriculture as a science, and to learn, *by seeing*, what they ought to do.

27. The vast and steadily increasing revenue which is derived from the cultivation of the country, and the stimulus imparted by largely enhanced prices to the demand for land and the investment of capital in the spread of agriculture seem to indicate that the time has fully come when the Government should take decided action for the promotion of agriculture, and adopt a system for the gradual advancement of agricultural education, intelligence, and knowledge, for the improvement of indigenous stock, and for the development of the resources of our fertile but neglected or overworked soils. The obligation has been fully acknowledged

by the Secretary of State and other Administrations in India, and is countenanced by the example of all civilized States.

28. The Board resolve therefore to take this opportunity of earnestly urging the necessity of establishing efficient model farms with classes for practical instruction. The first might be at once established in connection with the now flourishing farm at Sydapet; and, as soon as Superintendents have been trained to take charge of them, similar model farms on a smaller scale might be established in each district for the study and encouragement of local agriculture adapted to its peculiarities in respect to soil, climate, and natural condition. Classes for elementary instruction in agricultural science might also be formed in connection with zillah schools.

29. The advantages to be gained by such persistent and systematic efforts need not be discussed in the face of the examples set by England, Ireland, Prussia, and the Colonies. Possibly local agricultural societies in great measure independent of State aid might spring up in such districts as Vizagapatam (under the patronage of the Vizianagram zemindar) Tanjore, Malabar, etc.

30. As above noticed, there is in the Government farm at Sydapet the means of making a beginning. The Superintendent who has recently joined it is a thoroughly trained and scientific agriculturist, and his experience has satisfied him and the Farm Committee that model farms can be established with a reasonable hope of their being made self-supporting. What is now required is that the Superintendent's ability—he holds a diploma of the Royal Agricultural College—may be still further utilized by the establishment of an agricultural school in connection with the farm, where overseers and labourers may be trained, and whence they may be sent up-country as the means of extending operations to other districts become available.

31. Should the Government see fit to express their general approval of this proposal, the Board are prepared to make an estimate of the probable cost, and to lay down detailed rules for the management of such farms and classes. They entirely concur in the almost unanimous expression of opinion against the continuance of such desultory experiments as have hitherto been made with a view to improve the agriculture of the country, and are satisfied that more harm than good is done by them.

32. As regards implements and machines, the Board believe that what are wanted at the present time are such modifications of the simplest implements (*e. g.*, ploughs, drills, cultivators, etc.), as render tillage more efficient by increasing the productive powers of the soil *at a moderate cost*, rather than such as economize labour. Labour and animal power are still abundant and cheap, and must, for a long time, successfully compete with steam as applied to tillage in this country. Mr. Robertson's experience will no doubt soon enable him to prepare a list of all such implements as are likely to be practically useful on an Indian farm, and to suggest modifications to adapt them to the peculiarities of this country.

33. For example, on the Government farm at Sydapet it is found that even with high lifts water can be raised (and that too with far greater economy, certainty, and regularity,) by bullock power and picottah than by the steam lift, comparatively large as the stream raised by it is. Indeed, the great cost of fuel, and the expense of tedious repairs, etc., preclude the use of the latter altogether. In native hands up-country the use of any such machine is simply out of the question. Erected on a Government model farm the chances are that a steam water-lift would swamp all profits from wet agriculture and probably repel rather than attract the attention of native agriculturists to improved appliances. There are no doubt special localities where such a machine might be useful and economical, but the conditions of any such locality must be a subject of special consideration, and a careful estimate should be made before attempting any such expensive appliance. For some time to come, however, it would be better to discard steam-pumps altogether.

34. The steam plough again, is, so far as the Board can judge, unsuited to the present conditions of the country. Though applied to agriculture it is not really an implement used by the agricultural population in the less wealthy countries of Europe. Capitalists or large proprietors in England invest capital in what is more or less a commercial speculation and contract to do the ploughing at so much an acre. In this Presidency, the Government alone is for the present in such a position as a large landed proprietor as would admit of its owning and working a steam plough, and the Board are not disposed to advocate any experiment in this direction at present. Even in England it is not an easy thing to start and maintain a steam plough in remunerative working, except in wealthy districts with large farms; and the cost of cultivation even then (with cheap coal and skilled labour in abundance), exceeds what it is possible for the dry land in this country to pay. The Board observe from a recent Journal of the *Royal Agricultural Society* that the Duke of Northumberland's tenantry pay 10 shillings an acre for the ploughing of their land. In some places as much as 14 to 16 shillings is paid. This operation is done on the Government farm

at Sydapet, with powerful cattle and Ransome's improved ploughs at 1*s.* 6*d.* to 2*s.* an acre; and the ordinary charge in this country is from 9*d.* to 2*s.* (6 annas to 1 Rupee). It would probably not cost Government less than 15*s.* to 20*s.* an acre to plough in this country with an improved steam plough; and there is no part of the country where the ryots could be induced to pay for it. It must be further borne in mind that there are few districts in which such a machine could be moved in the absence of roads; and it is probably wholly unsuited to wet agriculture which alone could afford to pay such largely enhanced rates.

35. Hulling machines too should be discarded from the category of agricultural implements. Hulling rice is a manufacturing process. It takes the place that milling does in England or garbling coffee and preparing it for export does in this country. The producers do not hull their paddy for the market. It is purchased as paddy by the dealers, and can best be carried in this form, and it is hulled for the market or at the port of shipment by a special class of labourers with great skill and at reasonable rates. At Madras, 13 mercals of paddy are issued to the hullers, who return 6 mercals of well cleaned and unbroken rice and sometimes one-half of the husk also. Up country the rate is cheaper. There is no doubt that a suitable rice-hulling machine is a great desideratum in Madras; but it is for capitalists and manufacturers to turn their attention to this matter rather than farmers and agriculturists. Probably the firms who (according to General Cotton) are using machinery in Burmah are large exporting firms. These are the proper persons to interest themselves about hulling machines. It has been found impossible to use the rice-huller at the farm. It requires steam-power; and a large capital would have to be invested in the purchase of rice to keep it employed.

36. The same may be said of bone-crushing. It is scarcely a farm operation. It is much to be desired that there were bone-crushing factories all over a country like India where lime is so deficient in the soil, but this unwholesome manufacture must not be thrown on the agricultural institutions of the country. It is a significant fact that, although the export of bones from Madras to Ceylon is very large, no crushing machine has yet been set up in Madras to reduce their bulk and so facilitate stowage.

37. The Board decidedly approve of agriculture as an occupation for convicts, but do not consider that jail farms could ever take the place or properly answer the purpose of the model farms, the establishment of which they are now advocating as a means for raising the status of agriculture and enlisting the interest of the well-to-do classes. Jail farms cannot be public institutions open to the inspection and participation of the people, and the association might tend to degrade rather than elevate the subject in the eyes of the people. At the same time they are of opinion that arrangements might well be made with the co-operation of the Farm Committee for instructing Jail Overseers and Deputy Jailors under Mr. Robertson's superintendence, or trained workmen might be sent by the Committee to instruct prisoners in the use of improved implements at the various jails; but any efforts that are to be made to affect the agriculture of the country permanently must be systematic and persistent under such complete and established organization as shall command success. There is much to be learnt of the agricultural conditions of this country before European science can be applied to their improvement, and this knowledge cannot be gained without some opportunity of study and experiment at model farms and careful observations. The Board learn that already zemindars and others are sending their ploughmen and farm labourers to be instructed at the Government farm in the use of improved implements of various descriptions. The Maharajah of Vizianagram, the zemindar of Calastri, the jaghirdar of Arni, and some of the mirassidars of Tanjore have set the example, and it can hardly be doubted that with greater facilities of education *within their own districts* very many substantial ryots would gladly avail themselves of the opportunity of studying the various improvements in agriculture introduced by other nations.

Order thereon by the Government of Fort St. George,—No. 1657, dated 22nd September 1871.

THE Government have recently reviewed the report of the Sydapet Farm Committee for 1869-70 and 1870-71, and have recorded their satisfaction with the very valuable results which have been attained under the skilful management of Mr. Robertson, the Superintendent.

2. They consider that the time has now come when the Government may, with confidence and advantage, extend their operations over a wider field, and afford to the agricultural interests of this Presidency those benefits and aids which are being extended to them in other parts of India.

Two courses are open to Government for this purpose. They might inaugurate operations on a large scale, and endeavour to exhibit the results of high farming over wide areas, with expensive machinery and establishments in a manner to attract the ryots; but they are confident that no real good would be derived from such a course, and that it would rather tend to discourage enterprise. They prefer the less ambitious method of establishing model farms

of moderate size in several localities, with the view of demonstrating to the ryot the practicability of effecting sensible improvements by means quite within his reach.

3. The distinct objects at which the Government would aim may be epitomized as follows:

(1.) To ascertain by experiment the proper use of rotation in crops in this country.

(2.) To introduce the system of root or green-crops in lieu of fallow, without artificial irrigation.

(3.) To introduce new crops.

(4.) To provide new kinds of seed, and fresh seed for the crops now cultivated.

(5.) To make experiments in the use of water for the cultivation of crops now termed "Dry" crops, and for raising grasses and other crops to be used as fodder.

(6.) To make experiments in the use of lime and other manures—mineral and animal.

(7.) To introduce new and improved implements of rural labour.

(8.) To improve the working cattle, sheep, horses, and other varieties of live-stock in the country.

4. It is evident from the foregoing that the scheme will be mainly one for the improvement of dry cultivation; and although wet cultivation is incidentally affected with reference to seed and implements of labour, still the main objects of inquiry and experiment are dry grains and unirrigated products, cotton, silk, tobacco, indigo, wool, etc. There can be little doubt that the cultivation of rice and of the sugar-cane is well practised, and a due economy of water is the only point which need attract attention at present in regard to it.

5. Regard being had to the number of objects in view as above indicated, the Government consider that the proposed farms should be—

(1), of considerable area;

(2), in different climates and at different elevations;

(3), and placed conveniently with reference to water-supply, minerals, markets, and communications.

6. The area the Government consider should be not less than 200 acres for each farm, for although it may not at first be expedient to reclaim and cultivate more than 100 acres in each, still the additional cost of securing the larger area will be immaterial, and the command of means for future expansion is eminently desirable. The extent not immediately required for Government purposes might probably be leased out at yearly rents, or might be used for pasture, growth of firewood, etc.

7. The localities which for the present approve themselves to Government for the experimental or model farms are the districts of Bellary, Coimbatore, and Tinnevelly. Should it hereafter be deemed desirable to add a fourth farm, it might be placed in the Salem Baramahl, or perhaps by preference in Ganjam, where it would be accessible to the people of Vizagapatam. These districts are comparatively backward and inhabited in part by Ooriyas, the least developed of the people of the plains, and in part by hill-tribes almost destitute of any culture. But the districts have great capabilities, the climate is far more temperate than what prevails in the rest of the Presidency, and is probably specially suitable for the culture of indigo.

8. The primary object of the Bellary farm should be the cultivation of cotton, and the experimental use of varieties of seed, methods of culture, and mechanical processes; but a portion only of the area should be of the "black cotton soil," and the remainder should include other varieties of soil adapted for miscellaneous tillage. It will be an essential condition of selection that some portion of the area shall have means of irrigation either from a well-supplied tank or from reliable wells, or at least that water shall be attainable at such reasonable depth as to allow of wells being sunk and worked without extravagant expense.

9. In Coimbatore the special objects should be silk-culture, the growth of tobacco and cotton, the breed of sheep, and perhaps the breed of horses, and, with these in view, attention will be directed in the selection of a site to the suitability of the soil for the cultivation of the mulberry and of tobacco, and to a command of water for raising green-crops for the sustenance of live-stock. The farm should, by preference, be at a high elevation.

10. In Tinnevelly the position will be selected partly, but not chiefly or exclusively, with reference to experimental cotton cultivation. The farm will be for general experimental cultivation, in which cotton will have a part, and in which regard will also be had to tabacco, senna, etc.

11. In selecting the sites for these farms the Government do not desire that the requirement of first-rate quality of soil, of whatever category, should be insisted on. It will be sufficient that the land be of fair average quality, that its situation shall enjoy at least an average rain-fall as compared with the rest of the district, and that there shall be some partial water-supply, obtainable from a channel, a tank, or from wells.

12. A site will, of course, be selected conveniently placed as regards roads and existing or projected railways, and, if possible, within easy distance of a fair market for the farm-produce, including meat.

13. The neighbourhood of limestone of a quality fit to be burned for agricultural purposes would be desirable but not indispensable. The experiments made at the Madras farm in the use of lime are encouraging, except as to cost of preparation.

14. These district experimental farms will be placed in connection with the Sydapet farm, and under the superior management of Mr. Robertson, in whom the Government possess an officer admirably fitted for the post, and who adds to his other acquirements as a scientific and practical agriculturist, the great advantage of several years' experience of India, popularity with natives, and a thorough appreciation of the fact that the experiment, to be successful, must be economically conducted.

15. Mr. Robertson's present engagement expires on 10th October 1871, and from that date his salary will be raised to Rs 700 monthly, with horse allowance of Rs. 30 monthly, and his travelling expenses when absent from the Presidency on duty. He will retain his residence on the Sydapet farm free of rent.

16. Mr. Robertson will come under the Uncovenanted Service Rules regarding leave of absence and pension, and his service will date from the commencement of his original engagement. His duties will be to have the superior management of all the Government farms which may be established now or hereafter, the superintendents in immediate charge being his subordinates; to prescribe the course of operations; and to train the apprentices who may be placed under him for the superior charges. The Government have entire confidence in Mr. Robertson's competency for this important duty.

17. The general supervision of the agricultural experiment will be placed under the Board of Revenue, through whom Mr. Robertson will, in ordinary course, submit his reports and address Government.

But his reports on the individual district farms he will forward to the Board, through the Collectors of the districts to which they refer, so as to keep those officers informed of the progress of the local experiment, and to allow them the opportunity of recording any remarks they may wish to make.

Mr. Robertson will understand that the Government expect him to consult fully with the Collectors as to all action in their respective districts.

18. The direct management of each farm will be conducted under Mr. Robertson's orders by a Native Superintendent on a salary of Rs. 150 monthly, rising to a maximum of Rs. 250 by annual increments of Rs. 25.

19. To provide the necessary agency the Government resolve to establish four native apprenticeships at once, and to attach to them salaries of Rs. 40 monthly, with lodging on the Sydapet farm, and to instruct the Collectors of Bellary, Coimbatore, and Tinnevelly, to select for them from the ryot-class of their respective districts, or from some class connected with the land, each one young man, of age between 18 and 20 years, of good constitution and possessing a colloquial knowledge of English, who may be willing to enter into the engagement. The posts of Farm Superintendent will be given to the best qualified Apprentices at the end of three years' training.

20. The Collectors will also proceed to select in their respective districts one or more blocks of land, either waste or cultivated, extending approximately to 200 acres, and fulfilling the conditions above specified to serve as an experimental farm.

21. The land being indicated Mr. Robertson will be deputed to visit the site and report upon it. He will submit to Government through the Board of Revenue—

(i.) A rough estimate of the cost of establishing an experimental farm of the dimensions prescribed, contemplating, in the first instance, the cultivatien of 100 acres.

(ii.) A general estimate of an approximate character of the probable permanent charge which will be incurred for establishments, including his own salary, at the Government farm at Sydapet, and at the three provincial farms, making provision for four students at the Sydapet farm.

(iii.) Proposals for the reclamation and management of the three projected farms, until they can be placed in charge of their permanent Native Superintendents. It may be presumed that the requisite buildings could not be raised, and the necessary improvements perfected in less than two years from the present time.

22. As to the source whence the funds for this agricultural experiment shall be derived, the Government are of opinion that the Surplus Cattle Trespass or Pound Fund furnishes a suitable and sufficient provision.

23. Act I. of 1871 provides that this "surplus shall be applied, under the orders of the local Government, to the construction and repair of roads and bridges and to other purposes of public utility," and the Government consider that the object in question is a most appropriate purpose on which to employ part of the funds.

24. The budget for the current year estimates that an unapplied balance of Pound Funds of Rs. 77,000 will remain at its close, after allowing for a liberal allotment for roads and bridges, and the demands on the balance for the experimental farms cannot possibly be large for the remainder of this year.

25. The contribution from this source for roads, etc., in aid of local funds will not hereafter need to be on so liberal a scale as hitherto, and the Government do not doubt that ample means will be available for developing the present scheme.

26. They commit it to Mr. Robertson and to the Board of Revenue and district officers, with the confident anticipation that no efforts will be spared to ensure success, and in full hope of valuable results being attained for the improvement of the country.

(True Extract.)

(Signed) W. HUDLESTON,

Secretary to Government.

Report presented to the French National Assembly on the general condition of Public Works in France by M. Eugene Tallon, Reporter to the Sub-Commission for Works of Improvement in Agriculture and Irrigation.

SUMMARY OF THE REPORT.

Revision of the laws of 28th July 1860 and 8th June 1864. Modification of the Regular Estimate of the Budget for 1871. Transfer of the general direction of the Forest Department from the Exchequer to the Minister of Agriculture and Commerce, referred to the Commission for the Organisation of the Public Service and to the Commission on the Budget.

CHAPTER I.

OBJECT OF THE REPORT.

GENTLEMEN,—The necessity of turning to account the different undeveloped elements of wealth, which are the property of the State, with the view of raising our national prosperity, after its late disastrous fall, will amply justify the attention which the Commission for Public Works may grant to the subject of this report.

Among the undeveloped resources of our country, the waste lands of France stand in the first rank.

Out of 52 million hectares (about 130 million acres) comprised in the area of France, 11 millions (or about 27½ million acres) are represented by common lands, dykes, swamps, low undergrowth, and scrub, denuded steppes, &c., most of which would offer ample fields for the exercise of human industry.

The care of developing the resources of the State (independently of the efforts of private individuals) in the above particulars, has been entrusted to two principal departments of the State—

1*st*, to the Forest Department with regard to works of forestry, quarrying, improvements, and sea-dykes; and, 2*ndly*, to the Irrigation Department, with respect to its particular province.

The present report extends to the service for the administration of the Forests, with reference to which three questions of pressing importance present themselves for examination:

1*st*, the law of the 28th July 1860, which bears on the re-plantation of the bare hill-sides, has, after ten years' experience, ceased to work effectively: it is necessary to enquire whether this law should be renewed, and if so, with what modifications; 2*nd*, the reduction of regular estimate (Forests) for 1871 from 3 million francs, to 1,300,000 francs; 3*rd*, the transfer of the general direction of the Forests from the Bureau of the Minister of Finance to that of the Minister of Agriculture and Commerce.

CHAPTER II.

ON THE EFFECTS OF CLEARINGS ON RIVER INUNDATIONS.

Long experience has established the fact that the effect of clearing the hill-sides of wood, is to encourage the formation of mountain streams, and to aggravate the disasters caused by the inundations which are their immediate consequence. This cause, added to others acting in a similar manner (such as various sanitary works, the drainage of marshes, &c.), has resulted, it has been clearly proved, in a considerable alteration, during the last half century, in the rivers of France. This is especially the case with those rivers which take their rise in the central mass of the Cevennes Alps, and the period we are particularising is that marked by the disastrous inundations of the Loire in October 1846, in June 1856, and in September 1866.

In like manner, the intensity and extent of the mischief caused by the flooding of the rivers, has increased in proportion to the progress of the wood-clearings, which, with a strange want of foresight, the population has, through a long course of years, persisted in.

A series of royal decrees thought to favor the conservation of forests by threats of the severest penalties on all who should be guilty of the smallest infringements of them. The proprietors of wood-lands saw but one way of escaping these threats and trammels, *viz.*, by working ceaselessly to annihilate their own property. To this end, all means seemed good: on the one, neglect to plant fresh trees, the abandonment of all surveillance over their forests, unlimited grazing of cattle, the exercise, to an abusive extent, of all common rights, all worked as permanent agents of destruction; on the other hand, frequent times of war and of civil troubles, saw our best forests, in the course of reprisals, fall under the axe. The old system of State Forestry, then, has been rightly denounced as "one which tended to hinder the formation of plantations where they were wanted, and to the destruction of our finest trees wherever they existed."

The laws of 1791, in giving up to the municipalities wood-lands which had been taken from them in the feudal ages, hastened the devastation of forest lands. Everywhere wood-lands were cut and cleared; numerous mills and manufactories sprang up in the neighbourhood of the largest Forests, attracted by the advantages they afforded for supplies of fuel. As the wood diminished, its price naturally rose; it assumed a high market value, and the destruction of the Forests proceeded with fatal rapidity, as they became objects for money-speculation. Side by side with this, the division of property, which was the offspring of the new social movement, led to cleared lands being all given up to cultivation on the more precipitous mountain-sides, the clearances laid open soil, previously restrained and left in check by vegetation, to the merciless action of the heavy rains. Recently, however, these devastations have been recognized as subjects of regret, and their disastrous consequences have been understood—science has undertaken that which the operation of nature formerly sufficed for.

Experience has established the efficacy of planting as a means of retaining the soil on steep-mountain slopes, and of preventing their being cut up into ravines by the heavy rains.

"A Forest," says M. Sairrel in his remarkable work on the Torrents of the Alps, "when established on a mountain-side, modifies in reality the nature of the soil's surface, and all the conditions alter when the earth is no longer subject to the influences of the atmosphere. The same soil may be seen either cut up by torrents, or entirely free from them, according as the surface of the mountain is either clothed with wood or bare, and in the same way as it is common to see torrents cease among the primary formations, and break out again among the shales, clearing away the Forests, has been enough to make all these ravages re-appear. We see from this that, not only are Forests efficient for preventing the formation of torrents, but their influence is sufficiently powerful to stop the action of those already formed. How inefficient, then, does the most perfect system of dykes appear by the side of these great and powerful means which Nature employs, when only man ceases to thwart her, and she is permitted patiently to pursue her work through a long course of ages."

It is generally thought that Forests have the power, too, of modifying the violence of storms, by rendering the rain-fall and melting of the snows more uniform, and thus paralysing the

disastrous alterantives of sudden floods and prolonged droughts, which are the ruin of the country. These advantages, which are now generally recognised, have caused arboriculture, whether it be looked at from a public or private point of view, to be recognised as a necessary step in the course of agricultural progress, and have led to the intervention of Government on its behalf.

It is only, however, since 1860 that the various orders, which, from time to time, were passed, have been subjects of Parliamentary action, and so been legalised, although considerable works had previously been executed in various departments by private enterprise and through the initiative of the different agricultural societies, aided by important interventions from the State. It now remains for us to examine the spirit and effects of the special law which regulates the condition of Forests.

CHAPTER III.

THE LAW OF 28TH JULY 1860.—THE WORKS OF THE FOREST DEPARTMENT.

The law of the 28th July 1860, was enacted with the intention of pressing on the work of restoration on the hills, for which individual exertion only seemed insufficient.

The first clauses of this law relate to the action of Government with reference to arboriculture by means of subventions to private individuals, the second part treats of compulsory plantation. A decree (in the terms of article 5) speaks of the public importance of the works to be done, and fixes the boundary of lands subjected to compulsory re-planting.

Article 7 confers, in case of any refusal on the part of proprietors, a right of coercion to the administration, and authorises it to appropriate such lands according to the tenor of the law of the 3rd of May 1841. The law of 28th July 1860 was to hold good during a period of ten years, and to be renewable at the expiration of that time. A credit of ten millions was assigned for its execution.

The Forest administration, under the influence of M. Vicaire, then Inspector General of Forests, and whose name associates itself with this great undertaking of re-planting, set resolutely to work. Nurseries were formed, sowing and planting energetically carried out, and, in many places, instead of being entirely barren mountain-sides, became clothed with vegetation up to their very summits.

After the expiration of ten years, the results may be thus summed up: the balance sheet of the works in 1867-68 furnished by the Inspector General M. leFaré, who successfully carried out plans started by his predecessor, shows an extent of 95,000 hectares (2,35,000 acres) re-planted in the ten years, of which 70,000 hectares are due to works undertaken by aid of subventions, and 25,000 to the compulsory system. The Government works have produced considerable results, being, in many places, followed by a marked diminution in the impetuosity of the torrent courses. No better proof of the good effects of plantation can be wished for; they were aided and strengthened by works of embankment and drainage carried out by distinguished engineer officers.

Re-planting has been of peculiar importance within the range of the Alps and the central plateau. There it is that our two great rivers, the chief causes of devastation, the Rhône in the one and the Loire in the other, take their rise.

The work, the effects of which are already apparent, is far from being completed: in the Puys-de-Dôrne, re-planting has been extended over an area of 10,041 hectares up to December 1869, but there remain more than 50,000 hectares of bare slopes.

In the Haute Loire, the extent of re-planting has been from 1862 up to date, 3,332 hectares of lands in the worst possible condition, situated on the slopes which rise above the first reaches of the Loire and the Allier.

In the Alps, where the worst floods occur, the area fixed by public statute extends over 60,000 hectares, but five-sixths of this is not yet re-planted, and the same proportions hold good in other districts. Thus, the immense undertaking of improving our mountain tracts is far from being accomplished, and it remains to consider the best means for hastening its future completion. With this object, it is necessary to enquire if the law of the 28th July 1860 has produced such effects as might have been expected from it, and to consider what reforms might be desirable.

CHAPTER IV.

GRIEVANCES AND COMPLAINTS OF PROPRIETORS.

It must be admitted that the general feeling of the population is violently opposed to these laws for re-planting mountain-sides. They are looked on as an infringement of proprietary rights, as a subversion of time-honored usages, and as likely to aggravate the already impoverished condition of the people. This irritation soon showed itself in existence, in mischief done to nurseries and plantations, in quarrels with the Government Agents, and even by popular risings.

Complaints were universal, of which we still hear the echoes in the petitions (addressed by the people living among the mountains of Hérault and laDôrne) to the Assembly. It must be allowed that, for the most part, these complaints were well-grounded, being chiefly caused by certain severe clauses of the law—

1*st*, the two sudden and extensive curtailment of rights on grazing lands;

2*nd*, the method of fixing the areas within which compulsory planting was to be insisted on;

3*rd*, ejectments;

4*th*, insufficient allotment and an unfair division of compensation.

The right of pasturage on neutral and municipal lands is, it must be acknowledged, one of the most valuable resources of a mountain population, among whom the breeding of cattle is generally the only remunerative resource on which they can fall back. It offers, in an economical point of view, by the sale of their cattle, a considerable source of livelihood: it is, in fact, one of the oldest and simplest methods for assisting the poor, who are thus enabled to feed the solitary cow or goat they may possess.

The right of grazing is, then, an interest that should be respected, and, only with much caution, interfered in. Besides, if the enlightened classes of proprietors clearly see the advantage arising from a system of arboriculture which, in twenty years, increases by ten-fold the value of the land, it is not so with the poor proprietor who most unwillingly foregoes an annual profit, however small it may be, to await, in a far-off and uncertain future, the benefits of agricultural improvement. Whereas it was possible, these interests should have been met by giving a preference to the system of generating grass, which offers the same advantages for consolidating soil on the mountain-sides, as is offered by renewing the wood. The law of 1860 is, in this respect, lamentably wanting. Government soon recognised its own mistake, and, since 1863, M. Vicaire's report acknowledged that the law of 1860 could not meet the requirements of the complainants. "It is essential," he says, "to render the work of restoring the hills popular, in order to ensure its success." He assumes that fresh measures would be adopted to enable the authorities to carry out schemes for re-turfing. This gave rise to the law of the 8th June 1864, which extended to a renewal of the grass, the laws relative to re-planting, leaving Government officers to be guided by the nature of the soil, and the interest of the population, as to which method they would employ for consolidating the hill-sides.

But neither the tendencies nor the studies of Forest administration ever pointed in this direction, and statistics show that the system of re-turfing has been most sparingly resorted to.

To give an example: In the Puys-de-Dôrne, in spite of the grassy character of the mountains in that region, of which Nature (specially in the Mont Doré) gives the most unmistakeable proofs, only 350 hectares have been re-turfed, while 9,688 have been re-planted. We see the same proportion in the Haute Loire, where only 150 hectares re-turfed can be counted against 3,332 re-wooded. The complaints of proprietors are, of course, as strong and bitter as ever.

The determining of areas has been another source of disagreement: arbitrary administration often settled them, the influence of Forest agency being stronger than that of the cultivators' interests, and, in many instances, enquiries were made, neither sincerely nor in good faith. Owing to defects in the law, the agricultural element did not enter sufficiently into the composition of the commissions appointed to deal with the rights and customs of proprietors. As for the ejectments, they proved as irritating as they were inefficacious. This fact was recognised by Government, by whom that measure was but sparingly resorted to, both from respect to the rights of property, and from a fear of bringing discredit on itself. The compensations for the deprivation of the rights of pasturage was perhaps the best and most equitable measure for appeasing the irritation of the people. Had they been liberally and judiciously distributed, they might possibly have answered their object, but, being generally left to the Mayors for distribution, they were as often applied to municipal purposes as paid over to the dispossessed proprietors. Moreover, that they were insufficient may be judged from the fact that, for 3,332 hectares in the Haute Loire, a sum of only 12,000 francs has been paid in ten years, which represents an absurd annual amount per acre, so that this measure, in itself a good one, failed to attain its object.

CHAPTER V.

REFORMS.

We are firmly convinced that the law on compulsory re-plantation should be expunged from the new legislature. The law should be confined to a further development of the first principles of the Act passed in 1860, relating to re-planting by aid of Government subvention. Besides the main question of right, and the respect due to private property, compulsory re-planting has been condemned by its own results. The figures speak for themselves: it is known that, in the same space of ten years, the system of aiding by subvention produced a re-planted area of 70,000 hectares, while compulsory re-planting, in spite of the trouble Government officers took to carry it out and the zeal they all displayed, produced an area of only 25,000 hectares. Government recognised in its reports that this system must be abandoned in the central plateau, from whence rural progress receives its chief impetus. Only in the Alps should exceptions be made on account of the peculiar devastations which, by their constant recurrence discourage all efforts and render all expenses heavier. But there special measures should be adopted for the sake of one exceptional case, and clauses, productive of general mischief, should not be introduced into Acts of legislation because required in special localities. Certain it is that, if once the annoyances attendant on the compulsory system are removed, arboriculture, like all great agricultural improvements, will meet with sympathy from the population. In the second place, an absolute preference must be given to re-turfing instead of to re-planting, wherever the former is practicable. We are quite aware of the facts that, in some places, particularly in Ardèche, the sowing of grass will not succeed on account of the barren and precipitous nature of the mountains. We only recommend it where climate and soil alike are favorable, but with a conviction that, in such cases, the most valuable advantages will be derived from it. Let us sow plants fit for fodder on mountain lands; let us arrest the mischief caused by heavy floods by terracing the hill-sides which will answer instead of the hedges and supporting walls already in vogue among agriculturists. We shall then have the best means for restoring a soil in which a tree will be able to throw out roots and find means of existence, when this is desired without destroying pasturage, which can be distributed along the corners and edges of fields. Besides the advantages for production and consumption which public interest derives from renewing the grass, there is still another excellent reason for recommending this method, *viz.*, the cheapness of its execution. For example, while the Forest Administration has expended an average of 80 and 81 francs a hectare on arboriculture, re-turfing has only cost from 14 to 15 francs. The difference has been still more marked than this even.

The Government Reporter of 28th July 1860, M. Chevandière de Baldrome, expresses his regret that the law did not extend to the regeneration of lands which, for the sake of the pasturage they afford, remains uncultivated,—a measure which he thought might be eminently useful. In the agricultural enquiry, the Reporter for the Alpine district, M. Chapaigne Gozon, also complains of re-planting having been carried on too extensively, as compared with re-turfing. The representations on this subject have evidently been general.

The most conclusive reason is drawn from the fact of the popularity secured by this system of renewing grass (a system which satisfies all those whose interests are concerned), while it is, at the same time, equally efficacious for the regular distribution of the rain-waters and for protection against floods. Works of this nature should, therefore, be more widely extended.

The observations we are making do not tend, be it understood, to depreciate the importance of measures adopted for improving the mountain tracts; on the contrary, it is our wish to hasten this improvement by the employment of means more sure, because less vexatious. We think, too, there should be no diminution in the amount of sums allotted in indemnities and subventions. To stimulate the energy of proprietors and give it a strong impulse, generosity should be shown.

This opinion found expression in the enquiry of 1866: it was then requested that indemnities should be more universal to all who found themselves dispossessed of their grazing rights. Above all, it must be clearly ascertained that it is the proprietor who reaps the benefit of the financial sacrifices, self-imposed by Government; and, for this reason, all payment of indemnities should be made in future only on personal investigation and directly into the hands of those concerned.

It is also possible to do something by means of reducing taxation, not only on the land actually undergoing re-plantation, but on the sum total of the proprietor's liabilities. The idea of reducing taxes in order to encourage agricultural progress, is not new to our laws. We find it in the Edict by Henry the IV., in the year 1607, which declares "an exemption of twenty years from taxation and from duties on foreign export for those who have acquired property and possessions from draining and reducing marsh lands to cultivation," and (in article 13) "exemptions from all personal and poll-taxes, town and country rates, police taxes, and other like charges." It is known that, by such encouragements, a most beneficial influence was given to great agricultural schemes. Without going to so great a length in the remission of

taxes, the same plan has, in imitation of this famous Edict, been followed in subsequent laws, and it might still produce good effects.

There is no fear either of the State being a loser by these remissions, as increase of fertility by which this amount of taxable produce will be augmented, will always afford ample compensation. It is on such liberal bases that we wish to see the law of 1860 renewed. Government, we are glad to affirm, may give the impulse, but private enterprise, incited by the solid advantages to be derived, can alone complete the vast work of re-planting.

It should not be forgotten that before 1860, considerable results had been achieved by the encouragement of public associations without the help of State subventions. How, then, will it be, when these subventions, liberally and carefully distributed, shall have added their powerful stimulus to the first springs of action?

CHAPTER VI.

REGULAR ESTIMATE OF THE BUDGET.

Like the preceding ones, the budget of 1871 gave a credit of 35,000,000 francs to the Forest Department, for these objects—

(1), re-planting on mountains;

(2), making Forest roads;

(3), laying down turf.

The scheme of the regular estimate presented on the 15th of April last to the Assembly, reduces this amount to 1,350,000 francs.

The proposed reductions were to be thus effected: the sum of one million devoted to plantations was to be reduced to 500,000 francs; that of two millions devoted to roads, was to be reduced to 600,000 francs; and, lastly, the sum of 500,000 francs devoted to laying down fresh turf, was to be reduced to 250,000 francs.

The result would be that no plan for Forest roads of however great importance, would be carried out in 1871, neither could any scheme of re-planting or re-turfing be effected during the current year, the whole available amount being absorbed by necessary repairs, and the pay of the conservancy establishments. It is plain that a complete stand-still would ensue in these works of general utility, and the future would have to bear the deficit.

Thoroughly convinced that these great Forest works will, very shortly, more than repay Government for its self-imposed expenses incurred in order to accelerate events, it is with lively apprehension that we have seen such reductions in a corrected budget from allowances essential to render the uncultivated lands valuable.

Besides which, is this the right moment for the exhibition of an illiberal spirit, with regard to subventions tending to aggrandise our Forest domains, recently so cruelly diminished by cessions of territory to which we were obliged to consent. The wooded area of France covered, before the war, 8,860,435 hectares, of which the division was this—1,226,453 hectares were Government, 1,874,909 Municipal property, and 5,758,777 belonged to private individuals.

Now, one-eighth of this total, that is to say, one million hectares, has been taken away by the cession of Alsace and Lorraine, where, as is well known, our finest forests lie. Besides this, many of the Government Forests have been, during the war, subjected to much serious mischief. Let us then confide to the future the task of making our losses less apparent by reconstituting those elements of agricultural wealth which we have seen destroyed. In thirty years, the new Forests which may spring from plantations, will repay with interest to more fortunate generations the outlay that, for their sakes, shall be made by this.

Here arises another important question of political economy—that of the advantages to accrue to Government from a liberal encouragement of the working of all productive schemes; for such a far-seeing Government will not only spare nothing, but will itself make sacrifices. In this point of view, Forest roads are like public highways, for the maintenance of which sums are rightly claimed from the budget. Justice also demands the appropriation of a great proportion of the old balance, as guarantees of indemnity to dispossessed proprietors, and to those deprived of their common rights of pasturage. These obligations should be met with scrupulous fidelity: justice and right demand it.

CHAPTER VII.

TRANSFER OF THE FOREST DEPARTMENT TO THE MINISTER OF AGRICULTURE AND COMMERCE.

In studying the agricultural improvements resulting from plantations and the renewal of grass-lands under the direction of Forest Administration, we are brought to ask whether it would not be expedient (considering its own objects in the conservancy of Forest resources, as well as for the interests of the rural population) that this department should be placed under the Minister of Agriculture and Commerce.

The different processes of sylviculture, the enrichment of the soil, drainage,—all these are improvements which, of their nature, enter into the province of agricultural science. It would be well, then, that they should be placed under an authority competent in such matters and favorably disposed to extend to them credit and protection. It is easily understood why the Forests were placed under the Financial Department, so long as there existed that error in political economy which led successive Governments to regard our Forests as financial reserves on which to fall back in times of difficulty for filling the State coffers. Such abuses have, indeed, in former times, taken place, but, at the present day, no one would think, in spite of the heavy burdens laid on our country, of lightening them by the sale of our Forests. It is known now that it is necessary, from motives of public interest, to keep the Forest districts in tact, and even to extend and improve them. The conditions, therefore, of the question are changed.

The objection urged to this is that, with the Financial Department lies the responsibility of all Government revenue accruing from taxes of whatever kind, direct or indirect, from the cultivation and management of all State property which yields a surplus to Government and that the Forest Department was placed under it, because it represents, by the profit of its sales of timber, an important source of Government revenue, necessitating a management of capital for which account must be rendered. In answer to this, it may be said that many other branches of the public revenue are attached to other than the Financial Department, *e. g.*, mines, railways, mineral springs, some of which are under the Department of Agriculture and Commerce, and some under the Public Works Department.

It must not, however, be forgotten that the financial portion of the Forest Administration is not managed by the Forest Department,* since forest officers have nothing directly to do with the financial transactions of the department. The advocates of this reform point out also the similarity existing between schemes of draining and sanitation, and those of Forest improvement which are not dependent on the Financial Department.

* This is the case in France, where there are clerks attached to the Forest divisions, who manage all the financial work of the department, and are responsible for all credit, payments, tax, as well as for the rendering of the accounts.

It must be further remarked that the direction of the agricultural schools, as well as of experiments in agriculture and agricultural legislation, belongs to the Minister of Agriculture and Commerce. It seems, then, natural that the Forest colleges, as well as the legislation appertaining to forestry (which is but another form of agriculture), should be placed under the same authority.

It seems, too, out of place that technical and judicial questions regarding landed property should be made over to the Financial Department, when there exists, under another minister, a committee of scientific men, specially qualified to take cognizance of such matters.

The transfer of the direction of Forests to the Agricultural Department was wished for both in 1850 by the General Agricultural Committee, and since then by the United Committees, of a certain number of departments, by several agricultural and Forest societies, and by meetings of those most capable of judging in such matters. M. Chevandière de Valdrôme asked for this reform in 1869, at the Congress of Nanci. To quote his words—"The assignment of the Forest Administration to the Financial Department is," he said, "contrary to common sense, for the Financial Minister is a collector and, at this moment, a needy collector, not a producer of wealth. His natural but fatal tendency is ever to increase the resources of the present by sacrificing those of the future: has not an alienation of the Government Forests been recently proposed to fill up a deficit in the budget? The day the Financial Minister proposed such a measure, he showed the utter incompatibility existing between the spirit of conservancy which should animate a Forest Administration and the purely fiscal spirit of finance. Have we not seen the Government which controls municipal Forests, as well as those belonging to charitable institutions, exchange such property of which the value is daily increasing for capitalized payments? Is this a measure in the spirit by which Forest Administration should be animated?"

The superior officers of the Forest Administration have repeatedly signified a similar wish, which has always been silenced. They have pointed out that arboriculture has nothing in common with finance, but that to be separated from it is its truest interests. The Commission of Public Works in its turn demands this reform, pointing out its unanswerable advantages.

The Financial Department is accustomed to look on Forests as so much available capital, and the timber Forests especially are dangerously tempting objects of attack, in which the timber is often worth 3,500 francs per hectare on land apparently not worth more than 300 francs. Conservancy operations must, for the most part, form a State charge, as the profit derived is too small to attract private proprietors. What then would result of a short-sighted administration countenancing too readily these ill-considered alienations should compromise this important source of public revenue? Can we be assured, even at this moment, that our resources of large timber are not threatened, and that the fatal tendency to secure a present large increase of revenue at the expense of still larger losses in future, will not be yielded to? On a review of these arguments, we are assured that sums devoted to these great works of public utility would be less sparingly granted, and less subject to reduction if placed under the Agricultural Department.

Private agriculturists would also be more willing to enter into schemes of arboricultural improvement, because advice and encouragement would come from those whom they look on as their natural patrons, and whose authority they recognise.

Such, in brief, are the motives brought forward before the Commission in defence of this reform in ministerial organisation. There can be no doubt that they are of such a nature as to warrant serious examination, and to merit a favorable solution.

ORDERS ON THE REPORT.

First proposal—The revision of the law of 1860.

The Committee advices the renewal of the law of 1860, with following modifications—

1*st*, abolishment of compulsory planting on both municipal and private lands;

2*nd*, the continuance of Government aid, in money and kind, to all public bodies and private persons who shall carry out, on their own lands, the principles of Forest improvement;

3*rd*, a preference to be given, wherever possible, to the system of re-turfing in place of re-planting.

4*th*, to modify the composition of the Committees whose duty it is to fix the areas of the lands to which grants-in-aid are made, and to leave to public choice the election of members of these Commissions, which will be chiefly composed of agriculturists;

5*th*, to raise the amount of grants-in-aid which should partly take the form of remission of taxes to the persons concerned;

6*th*, to assure the direct payment of compensation for loss of pasturage to parties dispossessed.

Second Proposal.

Modification of the budget—to maintain the assignment for 1871 at 35,000,000 francs for Forest operations.

Third Proposal.

To transfer the direction of the Forest Department from the Financial Minister to the Minister of Agriculture and Commerce.

To make over, in consequence, to the Minister of Agriculture the assignments made in the budget to the Financial Department for Forest Administration.

The Committee of Public Works decides to submit the above reforms for the consideration of the National Assembly.

Ordered to be submitted.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

Neemuch Railway—Surveys from Indore to Ajmere.

Resolution by the Government of India, Public Works Department,—Nos. 2212-17 R., dated Simla, the 3rd November 1871.

READ again—

Public Works Department Resolution, No. 387R, dated the 6th March 1871, on the subject of a survey for a railway from Indore to Neemuch.

Letter No. 386 R, dated 6th March 1871, from the Agent to the Governor General for Central India, on the same subject.

Memorandum, No. 2093 G, dated the 14th October 1871, from the Government of India in the Foreign Department, forwarding a petition from residents in Nyanuggur, asking that a railway may be taken to their town.

Read also—

Letter No. 695 N.—R., dated the 30th September 1871, from the Agent to the Governor General for Central India, and enclosures.

RESOLUTION.—Since the orders of the Government of India were given for the preliminary surveys for a railway between Indore and Neemuch, a contract has been entered into for the construction of a railway from Agra to the Sambhur Salt Lake, with a view to extension to Ajmere and Nusseerabad, and the project for a railway from Khundwa to Indore, after careful preparation, extending over two seasons, has been so far matured as to permit of advertisements being issued, inviting tenders for the execution of the works which include a large bridge over the Nerbudda River, and the ascent of the Vindhya range to the plateau of Central India. The country between Indore and Neemuch has been also examined in a thorough manner, and each of the six alternative routes, which have been surveyed, possesses some characteristic advantages. The Government of India have ascertained that no unusual physical difficulty will be encountered on any of the suggested lines, and have now to decide which route will best meet the local wants of the Native States which will be traversed. This may absorb some little time as the interests of several Native Chiefs are affected according as one or other of the several lines examined may be adopted, but there appears to be no room for doubt that the line should pass southward, from Neemuch to Mundesore and Jowra, whatever location be preferred south of the last named place, and that the present season should be taken advantage of to locate the line finally between Neemuch and Indore, so that the designs and estimates may be got out during the recess of 1872, to admit of the commencement of work in the cold season of 1872-73.

2. The three survey parties which have been engaged on the country between Indore and Neemuch are ready to commence operations, and the Governor General in Council, therefore, determines that one party shall proceed at once to locate the line between Neemuch and Indore. It may be expected that by the time the party has done this as far as Jowra, the general direction of the line between that place and Indore will have been settled. The only instruction that it is necessary to give is that a ruling gradient of $\frac{1}{150}$ should be adopted. If this should make it expedient to abandon the existing road which, in the preliminary survey, it has been found possible to follow by using a gradient of $\frac{1}{100}$, a separate alignment should be adopted, but every endeavour should be made to carry the line in the vicinity of all important places. His Excellency in Council is desirous that the road should not be abandoned without full and sufficient reasons.

3. The other survey parties should continue the investigation from Neemuch to Nusseerabad in order to ascertain the best line on which through communication may be made. The general direction of the examination will be due north from Neemuch, and the existing road through Chittoregurh and Sanganeer probably indicates the line which will be best suited for a railway, but the country should be examined in a searching manner, and, if deviations from the direct line are thought to be desirable, they should be reported on. As to the precise direction of the line north of Neemuch the Governor General in Council will be glad to receive a full expression of the opinions of the Agents in Central India and Rajpootana, and requests that they will also make known their views to the Superintending Engineer. His Excellency in Council further desires that the needful communications may be made to the Chiefs of the Native States likely to be affected by the proposed railway, so that any representations they may wish to offer as to the direction of the line may be duly heard, and every assistance may be extended to Mr. Miller and his staff in the prosecution of the surveys. The Agent for Central India should, without delay, make known to the Chiefs concerned the instructions now issued for the final marking out of the line between Neemuch and Jowra.

4. Certain merchants of Nyanuggur have solicited that the railway may be diverted through that small but thriving town which is believed to be situated too far to the west, and in too difficult a country to be readily accessible by railway from the neighbourhood which it is now proposed to examine. The Superintending Engineer will, however, visit Nyanuggur, and will report on the feasibility of complying with the request of the inhabitants.

5. The Governor General in Council believes that there is less doubt concerning the towns to be accommodated between Neemuch and Nusseerabad, than there was on the line between Indore and Neemuch. The result of the preliminary investigations should be prepared and submitted at an early date to enable the Government to pass orders, and His Excellency in Council trusts that the centre line of the whole railway from Indore to Nusseerabad may be permanently staked out during the working season of 1871-72, so that the estimates may be taken out on the final line during the recess of 1872. The Superintending Engineer will be guided by the same general instructions in the prosecution of the further surveys as were issued to him for the section between Indore and Neemuch.

6. The section between Ajmere and Nusseerabad will be added to the Agra District of the Rajpootana Railway, and Mr. Furnivall will submit the estimates for this section as soon as ready, but as a distinct sub-division of the Sambhur and Ajmere Division.

7. The Governor General in Council is much satisfied with the results of the short season's work between Indore and Neemuch; a great length of trial line has been run in a very short space of time, and the results obtained reflect great credit on Mr. Miller and the officers* named by him, and afford evidence of much intelligence combined with rapidity of execution.

*1st Division	...	Lieutenant Firebrace, R. E., Exe. Engr. Mr. H. B. Addis, Asst. Engr.
2nd „	...	Lieutenant J. Dundas, R. E., Exe. Engr. „ A. G. Begbie, R. E., Asst. Engr.
3rd „	...	Mr. J. M. Span, Exe. Engr.

ORDER.—Ordered, that this Resolution be communicated to the Foreign Department, to the Agents to the Governor General in Central India and Rajpootana, and to the Superintending Engineers, Agra District, Rajpootana Railway, and Neemuch Railway Survey, for information and needful action.

Ordered also, that this Resolution be published in the supplement of the *Gazette of India*.

Indus Valley Railway—Mooltan District.

From MAJOR E. C. S. WILLIAMS, R. E., Deputy Secretary to the Government of India, Public Works Department, to the Consulting Engineer to the Government of India for Guaranteed Railways, Lahore,—No. 2258 R., dated Simla, the 8th November 1871.

THE plans and estimates of the Mooltan District of the Indus Valley Railway, together with the report of the Superintending Engineer in charge, and the accompanying note by the Consulting Engineer to the Government of India for State Railways, having been laid before the Governor General in Council, I am directed to convey the following observations and orders on the whole project.

2. Some of the chief features of this railway have already been separately considered, and instructions have been issued on the direction which the line is to follow, the number and position of the stations, and the nature and extent of the house accommodation that is to be provided. The detailed items of the estimate have now to be dealt with, and all sanctions that the state of the project, as submitted, will admit of, to be accorded in order that the work of construction may be vigorously prosecuted.

3. The direction of the line, as definitely approved, is from a point on the Shere Shah Branch of the Punjab Railway, *viâ* Shoojabad and Bhawulpoor to Khanpoor. This distance is divided into the following divisions:

		Length. M.	F.	F.
Shoojabad Division	... ...	50	0	0
Sutlej Bridge „	... ...	13	4	120
Bhawulpoor „	... ...	73	4	180
TOTAL	...	137	0	300

The present project includes the works for the construction of this length of railway, with the exception of the Sutlej Bridge, which will be separately dealt with. For the present it is only necessary to record that the orders recently issued as to the modification of the designs of the large bridges on the Punjab Northern Railway will be applicable to this bridge. The piers will be founded on three wells, each 12′ 6″ in diameter, to be undersunk in one line as close as may be possible, the piers being spaced at central intervals of 142 feet. Curbs should be constructed at once, and every endeavour made to sink some of the wells this season on the precise site of the crossing which should be approved by the Consulting Engineer for State Railways on his approaching tour. An estimate for the curbs

should be sent up at once, and the detailed report on this important work should be delayed no longer. A further estimate for the cost of the junction with the Punjab Railway, and the completion of communication on the narrow gauge between the point of junction and Mooltan is also submitted, but orders on this subject will be deferred until further investigation into this portion of the project has been made, and the views of the Sindh, Punjab, and Delhi Railway Company, which the Government of the Punjab were requested to elicit in my letter No. 294 R, dated 22nd February 1871, have been reported to the Government of India.

4. The items of the estimate for the main line will now be separately considered.

I.—PRELIMINARY EXPENSES.

The estimate under this head includes a sum of Rs. 4,86,938 which represents the cost of Mr. Brunton's survey in 1865, which has for purposes of audit been charged to the Shoojabad Division. The remainder of the item includes all charges already incurred which are properly debitable to this head, and no further expenditure is contemplated. The item is accordingly passed in full as under—

		Rs.
Shoojabad Division	... ...	5,01,305
Sutlej Bridge „	... ...	9,280
Bhawulpoor „	... ...	14,609
TOTAL	...	5,25,194

II.—LAND.

5. It is probable that the land in the Bhawulpoor State which is required for the purposes of this railway will be given free of cost, and the estimate, therefore, includes the cost of that portion only of the land which lies in British territory. The prime cost of all land is properly included in the estimate, although the ultimate charge for land will be reduced by the proceeds from the sale of lands temporarily required, when no longer needed, for the necessary deterioration of this land from the purposes to which it will be put, will make its temporary occupation, under the provisions of the Land Acquisition Act, undesirable.

6. The quantities of land have not been calculated in accordance with the rules contained in Public Works Department Circular, No. 10 R, dated 25th August 1871, as they had been worked out previous to the issue of this circular. The difference, however, is not important, and the schedules of land may be accepted without alteration on this account. The Government of the Punjab should be moved to take immediate steps for the acquisition and transfer of such land as lies in British territory, and a similar application should be made through the proper channel to the State of Bhawulpoor as regards the land lying therein. Sanction is accorded to this item to the following extent, which includes the estimated cost of compensation for the deterioration of property:

		Rs.
Shoojabad Division	... ...	16,168
Sutlej Bridge „	... ...	7,147
Bhawulpoor „	... ...	1,380
TOTAL	...	24,695

Before the land is taken up, enquiries should be made into the possibility of bringing the line nearer to the city of Bhawulpoor, as suggested by the Consulting Engineer for State Railways.

III.—Construction of Line.

(1).—*Earthwork.*

7. The country through which the line passes being very level, the ruling gradient has been taken at 1 in 500, except at the Sutlej Bridge, where the heavy approaches are, in accordance with the previous orders of the Government of India, graded at 1 in 300. I am directed to invite your attention to the remarks of the Consulting Engineer for State Railways in the attached memorandum on the possibility of reducing the average height of the embankment generally, and to desire that this may be done wherever no paramount reasons to the contrary are found to exist. In accordance, also, with the recommendation of that officer, the Government of India now direct that the gradient of approach to the Sutlej Bridge shall be fixed at 1 in 100, which will enable the estimated cost of earthwork to be reduced by Rs. 1,74,000. On the other hand, Rs. 10,000 must be added to the estimate to cover the cost of the sidings that will be required at the bridge.

8. The proposal to make a portion of the railway embankment near Bhawulpoor act as a bund to a large reservoir, the construction of which is said to be contemplated by that State, cannot be entertained at present. The Government of India have received no information respecting this reservoir; but should its construction be commenced by the State of Bhawulpoor, the Engineers of the Railway should promptly bring to notice any features in its design which might possibly endanger the stability of the line. I am directed to request that the substance of Mr. Molesworth's remarks on this subject may be communicated to the Political Agent at Bhawulpoor.

9. The rates assumed for the earthwork in the main embankment are in the—

	Rs.	A.	P.	
Shoojabad Division...	5	0	0	per 1,000 cubic feet.
Sutlej Bridge „ ...	11	1	4	„ „
Bhawulpoor „ ...	4	9	0	„ „

These rates are inclusive of all charges and have been carefully calculated out in accordance with the varying height of embankment and length of lead. The rate in the Sutlej Bridge Division will be somewhat modified by the steepening of the bridge approaches, but this is taken into account in the previously mentioned reduction of Rs. 1,74,000 on this account. The following amounts are, therefore, sanctioned for earthwork, including jungle-clearance, it being left to the Engineer in charge to make such reductions as may be feasible in the height of the embankments generally, in accordance with the foregoing remarks :

		Rs.
Shoojabad Division	...	1,02,623
Sutlej Bridge „	...	1,84,666
Bhawulpoor „	...	2,13,448
Total	...	5,00,737

(2).—*Minor Bridges.*

10. The principal works included under this head are the numerous small irrigating channels which pass across the railway. In many cases these are carried in barrel drains, which is probably the most economical plan, but larger flat openings are designed to suit various spans. The number of types of girders appears to be needlessly numerous, and they should be reduced to those laid down for general adoption, namely 2, 3 or 4 metres clear span as the case may be. No other dimension of girder for spans, not exceeding four metres, will be provided, and the works should be carried out accordingly. The rates for iron-work appear to be too high, but, on the whole, it seems probable that the cost of minor bridges will not be much less than the estimate, and this item of the estimate is sanctioned in full, as follows :

		Rs.
Shoojabad Division	...	73,877
Sutlej Bridge „	...	39,729
Bhawulpoor „	...	1,91,050
Total	...	3,04,656

(3).—*Large Bridges.*

11. The large bridges of which the cost is included in this estimate are few in number, and present no special difficulties. I am directed to invite attention to the remarks of the Consulting Engineer for State Railways on the designs, and to desire that, before any commencement, beyond the preparation of materials, is made in their construction, full information on the points indicated by Mr. Molesworth may be furnished for the orders of the Government of India.

12. The whole of these bridges should be constructed for a clear opening of six metres, and flooring and curtain walls should be provided as recommended by Mr. Molesworth. Deep foundations will not be required, and the cost will probably be within the total of the estimate which is sanctioned as shown below :

		Rs.
Shoojabad Division	...	18,448
Sutlej Bridge „	...	38,347
Total	...	56,795

(4).—*Level Crossings, &c.*

13. The estimate provides for 92 level crossings, of which 90 are furnished with lodges It is not reported whether the civil authorities have been consulted in fixing the number and sites of these crossings, as previously ordered, but if not, this should be done. How many gate-lodges, involving the employment of gate-keepers, are required cannot be said; but on a line which will be only partially fenced and will have but little traffic, worked at a slow speed, it seems highly improbable that the estimated number will be required. The item is, therefore, not sanctioned pending a report on the subject. The cost of the guard rails is transferred to the head of Permanent

Way in accordance with the ruling on the subject, but the remaining items for grade and mile posts, &c., may be passed. The cost of huts for maintenance gangs is not sanctioned; as, although the amount is small, there is nothing to show that these men could not live in neighbouring villages as is done in other parts of India. If this should be impracticable, sanction should be solicited to the construction of huts when they are actually required. The total sanction under this head amounts to—

	Rs.
Shoojabad Division	3,085
Sutlej Bridge „	758
Bhawulpoor „	4,633
TOTAL ...	8,476

(5).—*Fencing.*

14. The cost of a complete fence of iron-wire, or in some places of mud, is included in the estimates, which are calculated at very excessive rates. The Government of India reiterate the opinions that a fence need only be provided in the neighbourhood of large towns and stations, unless, perhaps, a short length is needed on either side of important level crossings. The gratings proposed by Mr. Molesworth should be provided at each extremity of an isolated piece of fencing, and early consideration should be given to this matter, and a report of the length that will, under these directions, have to be fenced, and of the amount of iron fencing needed for it, should be made in order that steps may be taken to procure the material.

Provisional sanction to the following extent is given to cover such preliminary expenditure as may be necessary:

	Rs.
Shoojabad Division	10,000
Sutlej Bridge „	3,000
Bhawulpoor „	12,000
TOTAL ...	25,000

IV.—BALLAST AND PERMANENT WAY.

(1).—*Ballasting.*

15. The estimate provides for a lower lift of sand at Rs. 2-8 per 100 cubic feet, and a covering of burnt clay at Rs. 9-8 per 100 cubic feet, the total section being the standard of 8½ square feet. These rates must necessarily be more or less approximate; and until ballast has been actually collected and burned, the cost cannot be definitely known. The proposed section is, however, approved, and the estimated cost sanctioned, namely,—

	Rs.
Shoojabad Division	1,48,916
Sutlej Bridge „	40,172
Bhawulpoor „	2,20,857
TOTAL ...	4,09,945

It may be as well here to remark that if the banks are thrown up with full allowance for consolidation, a great waste of expensive ballast will be prevented.

(2).—*Permanent Way.*

16. The estimate for this item requires modification as regards prices and weights, and should be reduced by the amount set down to cover the probable loss of materials, which cannot be allowed, as all material of whatever kind must be duly accounted for by the official in whose charge it may be. The figures given in Mr. Molesworth's memorandum show the probable cost of this item, according to the best available information, and the following sanctions based on those figures, and including the cost of guard rails at level crossings, and of the permanent way for five miles of sidings, are accordingly granted:

	Rs.
Shoojabad Division	10,01,571
Sutlej Bridge „	2,85,882
Bhawulpoor „	14,54,793
TOTAL ...	27,42,246

These figures include deodar sleepers to be supplied from the Punjab Forests at an average of Rs. 3 each, delivered at the depôts on the rivers, and exclusive of local lead. The Government of India desire that it may be understood that this rate is, in their opinion, excessive, and that in so far as purchases are made from the Forest Department, prices resulting in inordinate profits to that Department will not be sanctioned. The same remark applies to the supply of fuel.

The Government of India desire that the report on the distribution of the permanent way materials and the establishment of store depôts may be made at an early date.

V.—STATIONS AND BUILDINGS.

(1).—*Stations, &c.*

17. Orders have already been passed on the station buildings, and the number of stations, and the selection of Ahmed Chunner as a changing station has been approved. The engine shed at Ahmed Chunner should be built, and the stations should be laid out according to type designs which will shortly be issued. The construction of goods sheds should be deferred until further enquiry has been made into the necessity of providing them, and the watering arrangements modified in accordance with Mr. Molesworth's recommendations.

18. The necessity or advisability of placing the station of Bhawulpoor on a curve, as proposed, should be investigated before any steps are taken which would prevent a re-consideration of this matter.

19. These orders will affect the total of the estimate; and if the station machinery had been placed under a separate head, in accordance with the orders on the subject, instead of being included under the head of "Stations and Offices," the amount would be still further altered. It does not,

however, seem probable that the total cost of stations and station machinery taken together will fall below the amount shown in the estimate, and the following *provisional* sanction is, therefore, accorded. In revising this item of the estimate, which should be promptly done, in accordance with the instructions now conveyed, the cost of station machinery should be separated from the cost of stations and offices, and the totals reported to the Government of India for orders :

	Rs.
Shoojabad Division	... 57,272
Sutlej Bridge „	... 4,489
Bhawulpoor „	... 1,26,180
TOTAL	... 1,87,941

(2).—*Staff Quarters.*

20. The estimate for staff quarters has already been separately considered and sanctioned. The following sanction is now recorded in supersession of that formerly given :—

	Rs.
Shoojabad Division	8,494
Sutlej Bridge „	46,325
Bhawulpoor „	39,209
TOTAL ...	94,028

It is understood that the Superintending Engineer desires to make a trifling alteration in the grouping of units of accommodation at Adamwahan, involving no increase in expenditure. This may be carried out.

VI.—ELECTRIC TELEGRAPH.

21. The estimate provides for iron poles and one wire with brackets for a second wire at the Government Telegraph Department rates. The estimated cost may be nominally sanctioned, but the erection of the permanent telegraph will not be proceeded with without intercommunication with the Telegraph Department. It is probable that a temporary line should be erected in the first instance, at the cost of the Railway Department, and that when the rails have been laid, the existing telegraph line should be transferred to the railway, which will bear the cost of the transfer—

	Rs.
Shoojabad Division	42,700
Sutlej Bridge „	11,531
Bhawulpoor „	63,196
TOTAL ...	1,17,427

22. The sanctions now given are included in the following abstract, and supersede all existing sanctions for this district of the Indus Valley Railway,

with the exception of the sanction accorded in No. 294 R of 22nd February 1871 of Rs. 1,00,000, for the preparation of materials for the Sutlej Bridge :

HEAD.	Shoojabad Division.	Sutlej Bridge Division.	Bhawulpoor Division.	TOTAL.
	Rs.	Rs.	Rs.	Rs.
I.—PRELIMINARY EXPENSES	5,01,305	9,280	14,609	5,25,194
II.—LAND	16,168	7,147	1,380	24,695
III.—CONSTRUCTION OF LINE—				
(1).—Earth work	1,02,623	1,84,666	2,13,448	5,00,737
(2).—Minor Bridges ...	73,877	39,729	1,91,050	3,04,656
(3).—Large Bridges ...	...	38,347	18,448	56,795
(4).—Level crossings, &c. ...	3,085	758	4,633	8,476
(5).—Fencing *(provisional)* ...	10,000	3,000	12,000	25,000
IV.—BALLAST AND PERMANENT WAY—				
(1).—Ballasting	1,48,916	40,172	2,20,857	4,09,945
(2).—Permanent Way ...	10,01,571	2,85,882	14,54,793	27,42,246
V.—STATIONS AND BUILDINGS—				
(1).—Stations and Offices ...	57,272	4,489	1,26,180	1,87,941
(*N. B.—Provisional* as including station machinery.)				
(2).—Staff Quarters ...	8,494	46,325	39,209	94,028
VI.—ELECTRIC TELEGRAPH	42,700	11,531	63,196	1,17,427
TOTAL ...	19,66,011	6,71,326	23,59,803	49,97,140
Add 5 per cent. for contingencies ...	98,300	33,566	1,17,990	2,49,856
TOTAL ...	20,64,311	7,04,892	24,77,793	52,46,996
Total length of district 137 miles.				

23. These sanctions are exclusive of any charges for plant, which will be subsequently considered when the returns of requirements that have been called for, have been submitted, or for work-shops; also of the cost of rolling stock (say £600 per mile), the Sutlej Bridge (estimated to cost £200,000), the station arrangements at Mooltan, including the works and way that will be required to connect Mooltan with the junction on the Shere Shah Branch, (say £20,000), and establishment, estimated by the Superintending Engineer at less than Rs. 5,00,000. They include, however, all other estimated

$\frac{1}{10}$ Engine per mile.
$2\frac{1}{4}$ Vehicles per „

expenditure, and are sufficiently complete to permit the most vigorous and active prosecution of the construction of the line during the ensuing season. It would be a matter of the gravest disappointment to the Government of India, if from any cause the expectations of progress during the coming cold weather were not fully realized, and the Governor General in Council trusts that no efforts may be spared to carry forward the works to an early, successful and economical conclusion.

24. Finally, it may be recorded that the probable total cost of the district will be £900,000, of which sum about £220,000 will be expended in England. The mileage cost will be £6,500, of which nearly £1,500 is due to the Sutlej Bridge, and £350 to the surveys made by the Engineers of the Sindh Railway Company, some years ago.

Memorandum by the Consulting Engineer to the Government of India for State Railways on the Mooltan District of the Indus Valley Railway.

The alignment of the railway through this district appears to have been already settled; in fact the country is nearly a dead flat, which renders it feasible to take the line in almost any direction without greatly increasing the cost of the railway. The alignment is consequently determined by the relative fertility of the different districts, or the importance of the towns in a political or commercial point of view, rather than by the features of the country, or the irregularities of the ground.

The only point I would notice is that the line appears to be further than necessary from the town of Bhawulpoor, and that, probably, in carrying out the works, the Bhawulpoor station may be brought nearer to the town than it is at present.

There are but few points which it is necessary for me to discuss, as the country is so extremely easy that the only work of any importance is the Sutlej bridge and its approaches. The earth-work, except in these approaches, is very light, but yet it appears to be heavier than would seem to be warranted by the features of the country. Mr. Collet explains that this is owing to the liability of the country to be flooded in consequence of the bursting of some irrigation channels, and that, when this happens, the water stands several feet deep over the district through which the railway passes. It is difficult, however, to conceive that, with a flat country, the bursting of such small canals could inundate so vast a tract of country to the height indicated, and I recommend a careful verification of the facts before adopting these comparatively high embankments.

The approach embankments of the Sutlej are exceedingly heavy, running up with a gradient of 1 in 300 to cross the river.

Mr. Collet estimates the cost of these embankments (including the lead of materials) at Rs. 2,87,000.

I have requested him to estimate the saving that can be effected by the adoption of a gradient of 1 in 100, and he has sent to me a return showing a reduction of Rs. 1,74,000 by the adoption of this gradient. I recommend, therefore, that the gradient of 1 in 100 be approved for the approaches of the Sutlej bridge. The ruling gradients on the remainder of the line are 1 in 500, so that the adoption of this exceptional gradient at the Sutlej will have the effect of limiting the trains to the weight that an engine can take up a gradient

of 1 in 100. On the other hand, the traffic on the Indus Valley Railway, as a rule, will probably be so small, that long trains will seldom be required; but should they be necessary in exceptional cases, it will be easy to telegraph to the engine station nearest to the Sutlej to have a pilot engine ready to assist the train over the bridge, or else sidings protected by signals may be constructed on each side of the bridge, and the engine can take a portion of the train across the river to the siding on the other bank, and then return for the remainder. The additional cost of two such sidings would be about Rs. 10,000, thus reducing the saving on earthwork to Rs. 1,64,000; but as, in all probability, such sidings must, in any case, be made for terminal arrangements during the construction of the line until the completion of the Sutlej bridge, the permanent way materials alone should be considered as additional.

It has been proposed by the Bhawulpoor State officials to convert the Sutlej bridge approach embankment into the bund of an irrigation reservoir of some extent. To this scheme I am utterly opposed, for, with such materials as we may expect to obtain for our embankments, it would be a most unwise policy to allow the base of so large an embankment to be constantly saturated with water to several feet in depth.

Even should such a reservoir be constructed, I would stipulate that its bund should be removed some distance from the foot of the railway embankment, and that the portion of the reservoir bund next to the railway should be higher and more substantial than that which faces the river, so that, in case of an overflow, any breach will be towards the river, and not in the direction of the railway.

The Sutlej bridge itself is about one mile in length. Mr. Collet proposes single well piers of 12 feet 6 inches diameter and spans of 100′ from centre to centre. I presume, however, that the piers will be carried out in accordance with the recent decision on the Punjab Northern State Railway, and that, consequently, the piers will consist of treble wells. If these be adopted, I believe the most economical span of bridge will be about 40 metres in the clear. Mr. Collet estimates the cost of a treble well pier at Rs. 23,000, and the cost of iron work delivered and fixed Rs. 342 per ton, so that a span of about 67 tons is indicated as the best. I recommend that a portion of the bridge next the shore on each side of the river be provided with flooring and protective curtain walls, as recommended by me in the case of the Punjab Northern State Railway bridges.

The question of the waterway at the old bed of the Beas is one that appears to me to require further consideration. Mr. Collet proposes to provide only five spans of 30 feet, which appear to me to be insufficient to meet the rain-fall of exceptional years. Though the district is comparatively rainless, I learn that sometimes, after intervals of 20 or 30 years, it is subject to very violent and continuous rain. I note that the section of the line shews a gradual fall of the country from Mooltan to the old bed of the Beas, a distance of 29 miles, so that the railway, where it crosses the old bed of the Beas, is 24 feet lower than the average level of the country near Mooltan. From the old bed to the 49th mile, the ground and the railway gradually rise until they are 8 feet above the level of the line at the crossing of the old Beas, so that, practically, the railway intercepts the drainage of the tract of country about 50 miles in width, and probably as much in length, whilst the lowest part of the line is depressed 8 feet below the lowest boundary edge of the basin.

The question for decision is, whether the rain-fall in exceptional years is ever likely to be so excessive that the ground will become saturated and will not absorb the water that may fall on so vast an area. If so, the line has practically nothing beyond 5 spans of 30 feet and a number of small irrigation channels to meet a flow of water which would be very great. On the other hand, Mr. Collet assures me that there never is any water to speak of in this

old bed, and that the bed is not in the form of a regular watercourse, but consists of a series of depressions ponded up by sand banks or other natural deposits so as to offer obstructions to the possibility of any continuous flow of water. Still I think that the fact that so large a tract of country will be completely barred by the railway should suggest caution, and more full enquiry should be made before the outlet is closed; and should information prove that, in exceptional years, there may be a flow of water, an adequate flood opening should be left, which might be crossed by the line on the level.

The only other bridges deserving mention are spans of 54 and 30 feet: some of these have deep foundations. I recommend that all these be reduced to the six-metre type, and that the waterway be protected by flooring and curtain walls. In the case of the irrigation canals, a depth of 6 or 5 feet will suffice, as there is no scour. Such bridges will not be more expensive than those designed; in fact, I believe there will be a saving in the first cost of construction by the avoidance of deep foundations, and they will be more secure in case of scour caused by the bursting of the canal banks. The other small opentop bridges may be reduced to the types of 2, 3, and 4 metres clear span.

With our slow speeds the fencing may be discarded except in the immediate vicinity of large towns or stations; but where the fencing ends, I would recommend the adoption of gratings with trenches to prevent cattle trespass between the fences. I think too that if there is any probability of cattle trespassing on the embankments, it will be advisable to adopt the American expedient of placing at night a very powerful lamp on the front of the engine so as to throw a bright light to a considerable distance in advance of the train, and thus to enable the driver to ascertain whether there is anything on the line, and if so, to stop the train. Cattle, such as buffaloes or camels sleeping on the line, are dangerous to engines even with cow-catchers if they lie with their legs towards the engine as it approaches. I would suggest that General Strachey be requested to enquire into the character, cost, and consumption of the lamps ordinarily used on the engines of the American railways, and to send a few lamps out as specimens for experiment during construction. Mr. Collet recommends for ballast a hearting of sand with a covering of burnt ballast, and I recommend its adoption. I have used a similar ballast with success, and if sand of good quality can be obtained it makes a very smooth road. But fine sand is not so good in consequence of the dust it causes, and I fear some difficulty may be experienced in obtaining coarse sand.

The engineer should, at an early period, indicate the places at which he may desire the delivery of the sleepers, and the number to be delivered at each. As a first commencement, it would appear that about 40,000 sleepers should be delivered at Shershah, 40,000 at the right bank of the Sutlej where the line crosses it, 60,000 on the left bank of the Sutlej. It will also be probably necessary to establish other depôts on the banks of the Indus for the delivery of sleepers and other permanent-way materials.

The weight and approximate cost of the permanent way as designed by me will probably be as follows, the cost of rails and fastenings being assumed F. O. B. in England :—

Description.	Weight per each.	Rate.	Cost per each.
	Tons.	Rs.	Rs.
Rails	63·40	80	5,072
Fish-plates	2·75	100	275
Fish-bolts	1·00	155	155
Fang-bolts	2·25	150	171·1
Spikes	1·18	145	337·5
Shoes	4·50	100	450
Total Rails and Fastenings F. O. B. in England ...	75·08	.....	6,461
Freight charges, and stacking, &c., 75 tons at Rs. 70 = ...			5,250
Sleepers 2,000, at Rs. 3 = ...			6,000
Lead of materials = ...			312
Temporary ways, &c., = ...			120
Laying Rail = ...			1,100
Total per mile			19,243

or a total of Rs. 27,32,449 for 142 miles.

To this may be added Rs. 10,000 for sidings at the Sutlej bridge.

I see that Mr. Collet proposes to transport his materials by camel; but as the line is at a considerable distance from the river, it appears to me that it will be more economical to make arrangements for landing a large portion of the permanent-way materials on either bank of the Sutlej close to the site of the bridge, so that they may be carried on to the works by railway and laid telescopically. I think too that it will be found economical to make a temporary line from a landing ghat so as to use locomotives instead of camels between Khanpoor and Chunnee Gote. I have therefore reduced Mr. Collet's rate for lead.

I do not recommend that a percentage such as Mr. Collet proposes should be added to the permanent-way for losses; all losses should be accounted for.

The stations are 11 in number besides Mooltan; the maximum distance apart is 14 miles, and the average 11. Ahmed Chunner is proposed as an engine station: it is 71 miles from Mooltan, and about 75 miles from Khanpoor (the first engine station on the Rohree district). These arrangements appear to be suitable.

I recommend that the question of Mooltan Station arrangements, as well as that of laying the third rail, be postponed until I have visited Mooltan and had an opportunity of discussing the question with Colonel Pollard and the officials of the Punjab, Scinde and Delhi line.

The general arrangement of stations should, as far as practicable, be in accordance with the types which will be issued shortly.

The question of providing goods sheds may be postponed for the present, but store houses will be required for construction purposes along the line, and they should be so built, and on such sites, that they can be used as goods sheds hereafter. Mr. Collet proposes for engine sheds small spans of corrugated iron roofing 16 feet in the clear, with supporting walls between them; but I prefer the clear span of 30 feet (the type of roof already ordered) as the amount of corrugated iron is rather less in the case of the single than the double roof, and any increase in the cost of the roof principals will be more than covered by the saving in the middle wall, which will moreover be inconvenient in a running shed.

The foundations of the water tank may be carried down to a smaller depth, the weight distributed evenly over a broad bed of concrete by inverted arching.

The aqueduct appears to be too light, and would be probably blown down by violent winds. I would suggest that the well should be placed about 30 feet from the tank and, instead of an aqueduct, a light trussed angle iron trough might be substituted for it.

I think that the Persian wheel suggested by Mr. Collet might with advantage be exchanged for a self-tipping mote with a level run, as it will be less costly in first construction and less difficult to maintain, the only portions subject to wear being the ropes, four or five pullies, and the mote itself.

Mr. Collet's rates for roofing, turn-tables, &c., seem to be high; in other respects the rates are moderate. I would recommend that, as a distinct officer is about to be appointed as Engineer-in-chief to this line, he should be instructed to take into consideration at an early period the following questions:—

1*st*.—Whether the old bed of the Beas may not hereafter be subject to inundation in exceptional years of flood;

2*nd*.—Whether the height of some of the embankments may not be diminished, especially between Mooltan and the Sutlej;

3*rd*.—Whether there exists any necessity for placing the stations on the curve.

Sanction may be given to the following items:—

		Rs.
Preliminary expenses		5,25,194
Land		22,000
Earthwork		4,78,219
Bridge works, minor		3,04,656
,, major		56,795
Level crossings, &c., ...		7,540
Fencing		20,000
Ballast		4,09,945
Permanent-way and siding		27,42,449
Station buildings		1,87,941
Staff quarters		94,028
Telegraph		1,17,852
Total		49,66,619
Contingencies, 5 per cent.		2,48,331
Total		52,14,950

This does not include the following items:—

1. Station machinery.
2. Plant.
3. Rolling stock.
4. Establishment.
5. Junction with the Punjab Railway.
6. The Sutlej bridge.
7. Mooltan Station.

I propose to defer the consideration of Nos. 1, 2 and 3 until the printed store lists have been filled in and returned; Nos. 4 and 5 I propose to discuss when I visit the spot. For the Sutlej bridge the designs are not yet in, but I roughly estimate the cost at 20 lakhs of rupees.

GUILFORD L. MOLESWORTH.

The 27th October 1871.

Indus Valley Railway—Rohree District.

From MAJOR E. C. S. WILLIAMS, R. E., Deputy Secretary to the Government of India, Public Works Department, to the Consulting Engineer to the Government of India for Guaranteed Railways, Lahore,—No. 2262 R., dated Simla, the 8th November 1871.

THE plans and estimates of the Rohree District of the Indus Valley Railway, together with the report of the Superintending Engineer in charge, and the accompanying memorandum by the Consulting Engineer to the Government of India for State Railways, having been laid before the Governor General in Council, I am directed to convey the following orders and observations on the subject.

2. In the first place I am desired to acknowledge the completeness of the project, and to state that the Governor General in Council observes with satisfaction that the divisional and district estimates have been carefully drawn up in the prescribed forms, which enables definite orders to be passed on the several items of expenditure.

3. The Rohree District commences at Khanpoor and, as now aligned, runs *viâ* Rhetee, Meerpoor, and Khyrpoor to Rohree, the total length being 133¼ miles, which is divided into two executive divisions. This location has already been approved by the Government of India, and the detailed plans and sections do not show any cause for deviation from the adopted route, except at two places. One of these is of minor importance, and involves a slight diversion near Sadik-ka-Bustee, which should be carried out in accordance with Mr. Molesworth's recommendation in the attached memorandum. The other is a more serious matter. It appears that, during the flood season of the present year, the Indus has encroached near the village of Kassimpoor, a short distance above Rohree, to such an extent as to endanger the stability of a line constructed close to it, as originally designed. The alignment of this portion of the railway will, therefore, require re-consideration, and before the land is taken up, a report on the subject should be submitted by the Engineer in charge, after careful enquiry on the spot.

4. The estimates are framed for a railway on this approved location, and may be considered in detail.

I.—Preliminary Expenses.

All preliminary expenditure is at an end, and the sanction now required is a formal one to cover past charges on this account, in supersession of all outstanding provisional sanctions. The estimate is framed on the assumption that these have amounted to Rs. 1,000 per mile; and, as no further expenditure under the sanction is contemplated, the item may be passed as under—

	Rs.
Khanpoor Division	67,045
Upper Scinde „	66,207
Total ...	1,33,252

II.—Land.

5. The land required for temporary occupation has been estimated for as if it could be rented for the time that it will be needed; but as all railway land will necessarily be so deteriorated by the use to which it must be put as to be unfit for agriculture, it must be purchased outright, such portions as are not required after the line is open being subsequently sold. Some correction would, therefore, be needed on this score. On the other hand, the cost of the whole of the land has been included in the estimate, although the portion of it which lies in the territories of the Bhawulpoor State will probably be given free of cost. Moreover, the rates assumed in the estimate appear to be too high, as Mr. Nethersole has personally explained from more recent information. On the whole, the total of the estimate may be allowed to stand.

6. The quantities of land required were calculated before the recent orders on this subject were promulgated; but the Government of India will not require any revision of the schedules on this score, and immediate steps should be taken to move the Commissioner of Scinde and the Political Agent of the Bhawulpoor State to acquire and make over the necessary land with the least possible delay.

7. The sanctions now accorded under this head are—

	Rs.
Khanpoor Division	25,000
Upper Scinde „	25,000
Total ...	50,000

III.—Construction of Line.

(1).—*Earthwork.*

8. The earthworks throughout the district are generally light, although the side slopes are taken at 3 to 1, and the ruling gradient at 1 in 500. No objection is taken to the quantity of earthwork in the embankment, but the assumed rate of Rs. 7-8 per 1,000 cubic feet seems too high, although the cost of labour is great. In the adjoining Mooltan District of this railway, the rate of Rs. 5 per 1,000 cubic feet has been found sufficient to cover

the cost of earthwork when the banks are low and the lead short; and the Bhawulpoor State has taken a contract for the work on the portion of the line running through its territories at a rate which will be covered by this amount. An endeavour should be made to come to a similar arrangement for the Rohree District, and in the mean time sanction to a sum calculated approximately at the rate of Rs. 5 per 1,000 cubic feet will be given.

9. It has already been ordered that gaps shall be left in the embankment at the proposed sites of bridges and flood openings on the lower division, where the line will be exposed to the Indus spill, the ends of the embankment being temporarily protected by wattling, and the effects of the next season's floods being carefully watched. The items on account of this protection and for diversions may be passed.

10. The following sanctions are accorded to cover the cost of all earthworks and their protection:

	Rs.
Khanpoor Division	2,00,000
Upper Scinde „	4,41,000
Total ...	6,41,000

(2).—*Minor Bridges.*

11. The works coming under this head are principally openings for the passage of irrigating channels. I am directed to invite attention to Mr. Molesworth's remarks on this portion of the project, and to desire that, in accordance with his recommendations, barrel drains may be used wherever possible in the place of small flat openings, and that where this is impracticable and timber-top openings are constructed, transverse timber bed-plates may be put in.

12. The openings spanned by iron girders are more numerous in dimension than is necessary, and the prescribed types of 2, 3, and 4 metre clear span should alone be used for openings up to 12 feet span. For larger openings the 6-metre span should be employed. The remarks of the Consulting Engineer for State Railways on the use of plumb in the place of battered walls should be communicated to the Engineer in charge for guidance; but with these exceptions the designs are approved.

13. The Divisional Engineers are reported to have made careful enquiries as regards each irrigating channel crossed by the line, and openings have been provided over all such water-ways, except those that they found to have fallen into disuse. But it is necessary that on this point the civil authorities should make enquiries and certify to such disuse; and I am directed to request that this may be done at the time that the land is taken up and the result of the enquiries of the civil authorities formally recorded. The proposal of the Bhawulpoor authorities that an opening should be made at every half mile, in view of future possible irrigation works, does not seem to be desirable. Any existing channels should be properly bridged, and all rights of waterway maintained, but no expenditure on account of a possible, though uncertain, future contingency can be allowed. At the same time there will be no objection to give additional openings when required.

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14. The manufacture of good bricks is a subject of the very highest importance, and immediate attention should be directed to it. The Government of India cannot gather from the Superintending Engineer's report that good brick-earth has anywhere been found in the district, but no systematic search seems to have been made for it. It is shown that brick bridges of considerable age are standing on the adjacent high road, and it is probable that some brick buildings are to be found in the neighbouring towns. Enquiries should at once be instituted as to where these bricks were made, and a competent Engineer ordered to search in the river beds and other places for good earth. The experience of other Indian railways shows that it is impossible to over-rate the importance of the provision of good bricks, which will, to a great extent, govern the time occupied in the construction of the line; and the Government of India desire that the attention of the Engineer in charge may be urgently directed to this matter.

15. Similar enquiries should be made as to the sources where good hydraulic lime can be obtained, in the light of Mr. Molesworth's remarks.

16. The alterations in span, &c., now directed will, to some extent, modify the cost of the minor bridges, but sanction will be accorded to the estimated amounts as under—

	Rs.
Khanpoor Division...	107,331
Upper Scinde „	140,941
TOTAL ...	248,272

(3).—*Large Bridges.*

17. The designs for the larger bridges and flood-openings will require some alteration, and the Government of India desire that Mr. Molesworth's recommendations on this subject may be followed. Splayed wing-walls should replace the return walls shown in the designs in all cases except where the bridges are in deep cutting, and the brickwork should be built plumb instead of battered. The piers of the flood openings should be strengthened, and the cut-waters should not have a curved surface. The 6-metre type of clear span should be adopted for all openings over which the rails are carried on girders, and the foundations of the bridges over the Gorelee and similar channels should be undersunk blocks connected by flooring and a curtain wall instead of shallow wells, as designed. The design for the Eastern Narra masonry bridge should be altered as recommended by Mr. Molesworth, and it should be carefully considered whether a girder bridge would not be more economical in this place, considering the proximity to the river and the possibility of water carriage for the girders to site. Revised designs of these works should be submitted for approval before the 1st July 1872, in order that orders may be passed for their construction at the close of the rainy season of next year, if no circumstances should arise to make a variation in the extent of opening desirable.

18. As to the extent of waterway provided, the Superintending Engineer's project, which is based on the results of the enquiry conducted by Colonel O'Connell, appears to include the proper amount, so far as present

information enables a judgment to be formed. It may hereafter be necessary to modify this, according to the conclusions that may be drawn from more prolonged observation; but in the mean time provisional sanction is accorded to the full estimated cost, namely—

	Rs.
Khanpoor Division	32,696
Upper Scinde „	12,12,202
TOTAL ...	12,44,898

(4).—*Level Crossings, &c.*

19. This item of the estimate includes the cost of 15 level crossings with gate-keepers' lodges, and of 28 crossings without lodges. The opinion of the civil authorities as to the number of crossings required should be elicited. As a rule, gate lodges will not be required, and they should only be constructed at crossings where there is likely to be much traffic. The item is allowed to stand; but no expenditure should be incurred until orders have been passed on such reference as may be made after proper enquiry. The estimate for 56 pointsmen's huts is disallowed, as there is nothing to show that any of them are required on a line with so small a traffic as this; and so also is the item of Rs. 5,720 in each division for huts for maintenance gangs, who can probably live in the neighbouring villages, and for whose accommodation it is not shewn that any special buildings are required. The amount sanctioned is therefore—

	Rs.
Khanpoor Division	8,080
Upper Scinde „	4,910
TOTAL ...	12,990

(5).—*Fencing.*

20. Fencing will only be required near towns and stations and principal level crossings. The gratings ordered to be used in the Mooltan District of this Railway at each end of an isolated piece of fenced line should be constructed, and a report submitted showing the extent of fencing that will, under these directions, be required, and whether this can be efficiently constructed of mud or stone as cheaper than iron wire. The following *provisional* sanctions are given on this account:—

	Rs.
Khanpoor Division	10,000
Upper Scinde „	10,000
TOTAL ...	20,000

IV.—Ballast and Permanent Way.

(1).—*Ballasting.*

21. The section of ballast has the prescribed width, but is 13 instead of 12 inches in depth. The prescribed dimensions should be followed.

22. It is proposed to use burnt brick for the whole section of ballast at an estimated rate of Rs. 7 per 100 cubic feet. In the schedule of rates, sand and kunkur are both shown at Rs. 5 per 100 cubic feet; but it is not proposed to use either, nor is the quantity in which they are obtainable reported. All these rates appear to the Government of India to be doubtful, and until some ballast has been actually stacked in site, it is impossible to say accurately what its cost will be. The Consulting Engineer for State Railways recommends an inner core of sand, and a covering of burnt ballast, kunkur or broken stone, and this should be adopted if good sand can be procured.

23. While provisionally sanctioning the estimated cost of ballast as follows, the Government of India desire that the matter may be enquired into, and the probable expenditure on this account reported as soon as a trustworthy estimate can be framed:—

	Rs.
Khanpoor Division	2,26,919
Upper Scinde „	2,32,612
Total ...	4,59,531

(2).—*Permanent Way.*

24. The estimate for permanent way is capable of considerable reduction, and the sanction now given is based on the best available information as to the probable price and cost of carriage. The recommendation of the Consulting Engineer that the lead of the material from the river to the line should be effected by a temporary tramway is understood to be somewhat in accordance with the desire of the Superintending Engineer, as store stations at Chachur, Rajanpoor and Bhoong in the Khanpoor Division are estimated for. But no such stations seem to be contemplated in the Upper Scinde Division, although Kassimpoor, by which the line may pass, is said to be a favorable place for landing materials. An early report should be submitted in connection with the separate reference that has been made on this subject, it being noted that the number of landing places where store establishments must be kept up, and whence rails must be laid, should be as small as possible consistent with economy in leading, and that the two depôts indicated by Mr. Molesworth should alone be formed, unless it is clear that a greater number would prove more economical.

25. The following sanctions are accorded for permanent-way, to include the whole charges for 69½ miles in the Khanpoor Division and 68½ miles in the Upper Scinde Division, including sidings—

	Rs.
Khanpoor Division	13,91,571
Upper Scinde „	13,71,548
Total ...	27,63,119

It is noted that deodar sleepers are included at Rs. 3-4 each. These will probably be supplied chiefly by the Punjab Forest Department, and, while admitting this rate, it will be understood that the rates to be paid to the Forest Department will not be permitted to include an inordinate profit to that department. The same remark applies to the fuel that may be supplied by the Forest Department.

V.—Stations and Buildings.

(1).—*Stations and Offices.* (2).—*Staff Quarters.*

26. It is very desirable that as few buildings as possible should be erected, for use during the period of construction, that will not hereafter be required when the line shall have been opened, but the extent of accommodation required at each period can never in practice be the same. The Superintending Engineer's project indeed shows a possible use for each building both now and hereafter, but this has been attained by adapting the numbers of the probable working staff to the buildings. The Government of India do not desire that an apparent but fallacious economy should thus be aimed at.

27. The first thing to be done is to fix the probable strength of the staff to be housed. The Superintending Engineer reports that no accommodation is in any part of the line to be found for either the engineers or for the european accountants and clerks. He therefore provides buildings for—

1 Superintending Engineer.
2 Executive Engineers.
7 Assistant Engineers.
22 Upper Subordinates.

and 7 units of accommodation for clerks. This is approved.

28. The project also provides 15 units of accommodation for stores and store-keepers. The Government of India recognize the importance of providing store depôts, but it will be better to treat these in a comprehensive way in connexion with the tramways from the river depôts previously mentioned.

29. The project proposes the conversion of the buildings erected for the foregoing staff into accommodation for—

1 District Engineer and his office.
15 Station buildings.
8 Line Inspectors and Foremen.
5 Plate-layers.
2 Goods sheds.
9 Drivers.
9 Stokers.
8 Guards.
3 Gunners.
4 units for stores,
1 unit for telegraph clerks.

30. This staff seems to be much greater than the traffic will probably require, especially as it is the desire of the Government of India to use

native labour largely in the working of State Railways. The number of stations is, subject to certain conditions presently to be mentioned, approved; and engine sheds will be required at Rhetee, Khanpoor, and Rohree,—Rhetee being the changing station, and the other two running stations. Under this assumption, the following may be considered as the probable permanent working establishment:—

1 Executive Engineer.
2 Assistant Engineers.
6 Upper Subordinates.
15 Station establishments.
1 Locomotive Foreman (quartered at Rhetee.)
4 „ Drivers („ „)
4 Guards („ „)

In addition to this, running guards' and drivers' barracks will be required at all three stations, and some small space for stores. The accommodation should, therefore, be re-arranged on this basis. If the consequence is that some of the buildings necessary for the construction staff will be of no use hereafter, the loss must be considered as a legitimate portion of the cost of the line; but every effort should be made to reduce the number of such temporary buildings, and they should be built in the cheapest manner.

31. The Superintending Engineer proposes that the Executive Engineers' offices should be built in a permanent manner, so as to serve hereafter as goods sheds; but if constructed as ordinary dwelling houses, as proposed, they will be very inconvenient as goods sheds, and it will probably be better to make some economical temporary accommodation for these offices.

32. The engine sheds should be constructed in accordance with a type design that will shortly be issued. There appears to have been some clerical error in the district estimate by which the cost of the engine shed in the Khanpoor Division has been omitted, and the cost of the engine shed and store offices at Rohree and of the goods shed at Meerpoor placed under the head of Workshops instead of under Stations and Offices.

33. The Superintending Engineer proposes four classes of work in the construction of buildings. The Government of India agree with him that all foundations of main buildings in this district intended for permanent use should be pukka, but in buildings not exposed to vibration kutcha work will suffice, except in the foundations, quoins and arches. This will enable a considerable reduction to be made in the estimate, which, in the case of buildings occupied as staff quarters, will have the additional advantage of reducing the rent that the occupants will have to pay. The station buildings may also be similarly built where it is possible to retire them from close proximity to the line.

34. The minor recommendations contained in Mr. Molesworth's memorandum should be followed.

35. A revised estimate for station buildings and staff quarters becomes necessary from the instructions now conveyed, but the Government of India do not require the preparation of any fresh designs or detailed estimates. The cost of the several buildings has already been estimated, and all that is

required is to prepare a distribution statement according to the present instructions, with an abstract showing the total sanction required. In sending this forward for orders, it may be convenient to deal with the store accommodation simultaneously. The report appears to indicate that Kassimpoor is a better site for a store depôt than Rohree, though the latter is shown as the proposed site. All these matters should be clearly explained, in order that definite orders may be passed. The engine and goods sheds may, if desired, be excluded from this revised estimate, as they will have to follow types not yet promulgated, but all other buildings should be included. The Government of India will look for the submission of the revised estimate within two months from the date of this letter.

36. I am also directed to request that the views of the civil authorities as to the necessity of stations at Rhetee and Punnoo may be ascertained. It is understood that there is practically no traffic at these places, and a rearrangement of stations might result in the suppression of one or two station establishments; but there is no desire to pass by any convenient place where traffic exists or may be developed, and further information on the point is desired.

37. With these remarks, I am directed to accord *provisional* sanction to the following sums to cover the preparation of materials:—

	Rs.
Khanpoor Division	75,000
Upper Scinde „	75,000
TOTAL ...	1,50,000

(3).—*Station Machinery.*

38. The estimate for this appears to be capable of considerable reduction, but no definite sanction is required until the submission of the indent which has been called for in Public Works Department No. 1922R., dated 4th October 1871. Ash-pits should not be included under this head, but under Stations and Offices.

VI.—ELECTRIC TELEGRAPH.

39. The estimate for this covers only the cost of temporary supports, and does not include any other charges. Taking the estimate prepared by the Government Telegraph Department for the Mooltan district as a guide, it would appear that the following sums would be required for this purpose, and they are accordingly sanctioned:—

	Rs.
Khanpoor Division	60,300
Upper Scinde „	59,700
TOTAL ...	1,20,000

This amount will more than cover the cost of the temporary line if first erected, and of the transfer of the existing line to the railway when the rails are laid.

VII.—PLANT.

40. The item for engineering plant, though properly shown in the estimate, cannot be dealt with until the receipt of the indent mentioned in

paragraph 38: but Rs. 25,000 for each division is sanctioned *provisionally* to cover any necessary immediate expenditure. The estimated cost of furniture is sanctioned as under—

	Rs.
Khanpoor Division	2,200
Upper Scinde „	2,400
TOTAL ...	4,600

41. The sanctions now granted are shown in the following abstract. In a few respects they will require to be supplemented hereafter, and they are exclusive of all charges for rolling stock or establishment. But they are sufficiently complete to allow of the most vigorous prosecution of the work of construction, and the Governor General in Council trusts that no time will be lost in commencing active operations, in order that before the next floods the earthwork may be completed throughout the district and sufficient bricks made and burned to enable the construction of the bridges to be put in hand at the close of the rains of 1872.

HEAD.	Khanpoor Division.	Upper Scinde Division.	TOTAL.
	Rs.	Rs.	Rs.
I.—PRELIMINARY EXPENSES	67,045	66,207	1,33,252
II.—LAND	25,000	25,000	50,000
III.—CONSTRUCTION OF LINE—			
(1).—Earthwork	2,00,000	4,41,000	6,41,000
(2).—Minor bridges	1,07,331	1,40,941	2,48,272
(3).—Large „	32,696	12,12,202	12,44,898
(4).—Level crossings, &c.... ...	8,080	4,910	12,990
(5).—Fencing, *(provisional)* ...	10,000	10,000	20,000
IV.—BALLAST AND PERMANENT-WAY—			
(1).—Ballasting	2,26,919	2,32,612	4,59,551
(2).—Permanent-way	13,91,571	13,71,548	27,63,119
V.—STATIONS AND BUILDINGS—			
(1).—Stations and Offices (2).—Staff Quarters ... *(provisional)*	75,000	75,000	1,50,000
VI.—ELECTRIC TELEGRAPH	60,300	59,700	1,20,000
VII.—PLANT	.....	.....	.....
(1).—Engineering, *(provisional)* ...	25,000	25,000	50,000
(2).—Station and Office Furniture ...	2,200	2,400	4,600
TOTAL ...	22,31,142	36,66,520	58,97,662
Add 5 per cent. contingencies ...	1,11,557	1,83,326	2,94,883
	23,42,699	38,49,846	61,92,545
Length of line, 133¼ miles.			

42. In conclusion, it may here be recorded that, including rolling-stock (£600 per mile), station machinery, workshops and establishment, as well as allowing for the insufficient provision made for fencing, stations and buildings, the total cost of this district will be about £800,000, of which the expenditure in England will probably be £200,000. Thus the total mileage cost will be £6,000, of which £900 are due to the openings for the Indus floods. Omitting the extraordinary items in both districts, the line in the Rohree district will cost about £400 to £500 a mile more than in the Mooltan district. Taking both districts together, the total cost will be about £1,700,000 for 270 miles of railway, averaging £6,300 per mile.

Memorandum by the Consulting Engineer to the Government of India for State Railways on the Rohree District of the Indus Valley Railway.

Mr. Nethersole's report is very full and complete, and explains clearly the manner in which he proposes to deal with the question of the openings to provide for the flood-water of the Indus.

This question has already been settled, so far as the information before the Government will allow of a settlement, and as this is the only question of magnitude on the district, there remains but little further to require remark.

The country, like that of the Mooltan district, is remarkably easy throughout, being a dead flat, and the line skims the surface with very light embankments.

The only point at which deviation may be needed is near Sadik-ka-Bustee, between the 34th and the 51st mile, where the line may, I think, be altered with advantage to avoid a double crossing of the road and of a large dry nullah. It is possible also that some deviation at Kasimpoor may be necessary in consequence of the late inroads of the Indus at that point.

The rate of Rs. 7-8 per 1,000 cubic feet should, if possible, be reduced. In the Mooltan district the Bhawulpoor State has agreed to much lower rates, and there should be, if possible, an avoidance of competition or invidious comparison between the two districts. The earthwork is all of the easiest and lightest description, and should be done at low rates. I think, therefore, the item of earthwork might be reduced.

I recommend that the question of the placing culverts in the disused waterways shall be settled in each separate case by the local civil authorities in conjunction with the engineer. The proposal to adopt a large irrigation culvert at every half mile, to provide against all possible contingencies of cultivation that may arise hereafter would, I think, entail useless expenditure, for, with the light embankments of this district, it will be easy to insert irrigation culverts when the line has been completed and opened for traffic.

After that time I think that all irrigation culverts that may be required should be constructed on application, provided the applicant is willing to defray the expense of it.

The question of making bricks is important, and no time should be lost in ascertaining where good bricks can be made, and in commencing their manufacture.

The question of obtaining hydraulic lime for concrete and foundations is also one demanding prompt action. So far as I can learn, the lime in the district is chiefly a fat stone lime.

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As a general rule the brick-work in the bridges is too light, especially in some of the piers of the flood openings.

In the small culverts and flood openings I should prefer plumb to battered walls; the amount of saving to be effected by battered walls being insufficient to compensate for the intricacy of construction and difficulties of bonding the battered with the plumb work when comparatively unskilled native workmen are employed.

For the same reason I would propose to adopt right angled cut-waters or starlings to the piers instead of making them curved, for although the curved surface will pass the water rather more freely than those of pointed rectangular shape, they are far more difficult of construction and do not admit of so easy a bond. The bricks vary with every width of pier, whereas with the rectangular cut-water only one form of splay brick, besides the ordinary brick, is necessary for all sizes of pier.

In many cases where flat openings are shewn, I think it would be productive of economy to adopt a barrel drain. Such a drain whilst effecting a saving in brick-work will be less liable to be shaken by the vibration of the train than when the beams come into direct contact with brick-work. In all cases of beam openings there should be transverse bed plates of timber.

In most cases I should recommend the adoption of splayed wings in preference to the return walls shewn in the drawings; in some cases, where the bridge is in deep cutting (as in crossing several of the irrigation canals), the return walls may have some advantages: in all other cases I should prefer splayed wings.

For the main flood openings Mr. Nethersole has, as a general rule, designed 40 feet spans on single wells carried to no great depth; in some cases these are combined with a series of 12 feet openings having shallow floors and curtain walls.

I should rather prefer the system of flooring and curtain walls throughout and to adopt the type span of 6 metre in the clear for the whole of the openings; I should carry the curtain walls rather deeper than shown in the drawing, especially where the surface of the ground is low; and at the centre of each series of openings I should be inclined to sink the line of flooring so as to keep the flooring of the middle spans rather lower than that of the side spans. By a rough calculation, I find that the adoption of the 6 metre clear span throughout would be productive of some economy.

The absolute amount of flood opening should be decided after experience in the effect of floods when the earthworks have been raised.

There are several irrigation canals crossed by the railway, and the bridges of all these might be formed of spans of the 6 metre type. All other iron bridges, except the large flood openings, may be of the 2, 3 or 4 metre type.

The piers of the bridge over the Eastern Narra are very light and should be increased; the abutment should also be increased, and backing should be carried over the arch.

For the majority of the level crossings I think that both gates and huts are unnecessary; there should be simply a ramped approach, and if there is likely to be cart traffic, the crossing should have guard rails.

Before the construction of plate-layers' huts is sanctioned, it will be well to ascertain whether there will be any difficulty in providing accommodation for the platelayers in the villages adjoining the line, so as to avoid the necessity for providing special buildings for them. Fencing may also I think, as a rule, be dispensed with, except near stations and large towns. If good sand can be procured, I recommend it for the hearting of the ballast, protected by a covering of burnt ballast, kunkur or broken stone. The weight and cost per mile of

permanent way will probably be as follows. The rate is for delivery F. O. B. in England:

Description.	Weight per mile.	Rate.	Cost per mile.
	Tons.	Rs.	Rs.
Rails	63·40	80	5,072
Fish-plates	2·75	100	275
Fish-bolts, &c.	1·00	155	155
Fang-bolts	2·25	150	337·5
Spikes	1·18	145	171·1
Shoes	4·50	100	450
TOTAL ...	75·08	.....	6,460·6

	Tons.	Rs.
Total F. O. B. in England	75	6,460·6
Freight charges and stacking, delivered on banks of Indus ...	... ...	5,250
Sleepers 2,000, @ 3-4	... ...	6,500
Lead of materials	... ...	312
Temporary Roads, &c.	... ...	180
Laying Road	... ...	1,320
Total per mile	... ...	20,022·6

or for 138 miles including sidings=27,63,119. Much of the lead may, I think, be done by rail, for there would appear to be no difficulty in laying the rails on the surface of the ground (where the bridges are incomplete) and running out the material; even in flood time the motion of the water appears to be so small, that the rails would not be displaced. A temporary line from a landing ghat on the Indus opposite to Surhud, and another from Rajunpoor to Nowshera, would probably enable all the lead to be done by locomotive.

The whole of the local supply of sleepers will probably be required for the section of the line between Sukkur and Kotree, and it is therefore necessary to assume a higher rate for the sleepers than for the Mooltan district, if they are brought down the Indus. The question of depôts on the banks of the Indus should receive early attention.

The station buildings are designed with flat roofs, and Mr. Nethersole explains that his object in adopting this form is to utilize the roofs for sleeping so as to remove the occupants from the malarious influences to which they may be exposed if they sleep too near the ground. I think his reasons are worthy of consideration. The beams supporting these roofs are too few in number: they should be not more than two feet apart. The expensive fan-light over the doors may be discarded, and the span between the arch and the door-frame filled in with brickwork half brick thick. I recommend that the foundations should in all cases of permanent buildings be of pukka work.

The stations proposed are 15 in number, the maximum distance apart being 14 miles, the average 9 miles.

Engine sheds and quarters for drivers are proposed at the following places:

	Miles.		Distant apart. Miles.
Rohree	133	distant from Rhetee	67
Rhetee	66	,, ,, Khanpoor	64
Khanpoor	2	,, ,, Ahmed Chunner	75

Ahmed Chunner being about 71 miles from Mooltan.

These general arrangements appear to be suitable and the accommodation proposed reasonable. The rates for station materials appear to be high and will bear reduction.

The engine shed and ash-pits may be carried out in accordance with the types to be furnished: ash-pits may be put in about every 20 miles. Water supply, not less than 300 cubic feet, should be provided at every station at alternate ends of the station; about 1,000 cubic feet of water should be provided at the changing stations, or $12\frac{1}{2} \times 20$ feet $\times 4$ feet deep. I recommend the adoption of the ordinary country mot arranged so as to be self-tipping, in lieu of force pumps, for the supply of water.

The Norton pumps should not be used in combination with the ordinary well, but should be quite distinct.

I recommend that the following be sanctioned:

	Rs.
Preliminary Expenses	1,33,252
Land	50,000
Earth-work	6,41,000
Minor bridges	2,48,272
Large ditto (provl.)	12,44,898
Level crossings	28,630
Fencing (partial)	20,000
Ballast	4,59,531
Permanent way	27,63,119
Station Buildings (provl.)	1,50,000
Engineering plant („)	50,000
Station furniture	4,600
TOTAL ...	57,93,302
Contingencies, 5 per cent....	2,89,665
TOTAL ...	60,82,967

This does not include the following items:

		Rs.
1.	Station Machinery	1,50,400
2.	Portion of Buildings	2,41,131
3.	Rolling stock	
4.	Portion of Plant	34,616
5.	Telegraph	5,00,000
6.	Establishment	

Nos. 1, 2, 3 and 4 may be settled when considering the printed lists as a whole, and so soon as we learn the exact details of the rolling stock we are to receive from England.

GUILFORD L. MOLESWORTH.

The 2nd November 1871.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Reports on the state of the season and prospects of the Corps.

GENERAL REMARKS.—The general aspect is little changed from that shewn in the reports published on the 28th ultimo.

In Bengal prospects are even more favourable than when last reported, and in Madras, the North-Western Provinces, Oudh, British Burmah, Sind, Mysore, and Coorg, the harvests will be fair. In some districts of the Central Provinces the want of rain has been felt, and in Nagpore the demands of Khandeish and Berar for grain have enhanced prices. But on the whole, prospects in the Central Provinces are good.

In those parts of the Bombay Presidency which have suffered from deficient rain-fall, the crops have failed, and there, as also in the Punjab and the Berars, especially West Berar, scarcity is to be feared.

Except in Khandeish and the Deccan, the prospects of Cotton continue favorable.

No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of Agricultural prospects.	Remarks of Local Government or Administration.
1	MADRAS ...	Masulipatam ...	November 8 ...	1·5	November 9 ...	Crops in upland talooks good. Delta crops suffering from drought. Prices stationary, except paddy which is high and rising.	General prospects fairly good.
		Negapatam	„ ...	11·96	„ ...	Prospects good. Prices stationary ...	
		Kurnool	„ ...	*Nil*	„ ...	Some dry crops withering. Tank water deficient. Prices high.	
		Trichinopoly... ...	„ ...	3·47	„ ...	Crops flourishing. Prospects good. Prices stationary.	
		Calicut	„ 7 ...	·92	„ ...	Crops flourishing. Prospects good. Prices low and steady.	
2	BOMBAY ...	Dharwar ...	November 8 ...	·2	November 9 ...	Early crops in good condition, except Jowaree which is suffering in a few places from heavy dews. Sowing of late crops nearly complete. Cotton good.	Cotton crops in Ahmedabad and Kaira fair, in the rest of Goojrat and in the Southern Mahratta country, good. In Khandeish and in the Deccan Cotton prospects generally unfavourable. In Khandeish, the Deccan, parts of Goojrat, and the Concan, the prospects of the season are worse than already reported. Elsewhere, no change.
		Khandeish ...	„ ...	*Nil.*	„ ...	Prospects dark. Prices rising. Crops not worth mentioning.	
		Sholapore ...	„ ...	...	„ ...	Rubbee crops withering.	
		Poona ...	„ ...	...	„ ...	Khureef generally good. Rubbee withering.	
		Goojrat ...	„ ...	...	„ ...	Dew is pretty general. Heat greater than usual.	
		Surat ...	„ ...	...	„ ...	Early crops withering.	
3	SIND	.....	.....	*Nil.*	November 9 ...	Cotton prospects good in Upper, not so favorable in Lower Sind. Khurreef harvest in operation. Bajree above 10 seers; wheat from 11½ to 15; rice 9. Temperature dry and hot in the day. Mornings cool.	
4	BENGAL ...	Patna Division ...	„ 8 ...	...	„ 9 ...	Weather fine and dry, favorable for sowing the rubbee crop. Rice crops better than was expected. From a 12 to a 14-anna crop expected. Cold weather crops promising.	The prospects of crops generally are very favorable.
		Bhaugulpore „ ...	„ ...	...	„ ...	Weather excellent. Prospect of crops very good. In Rajmahal and Deoghur, Amun crops suffering from want of rain.	
		Rajshahye „ ...	„ ...	...	„ ...	Weather bright and clear. Crops much improved. In Dinagepore rice on high lands suffering from want of rain.	
		Burdwan Division ...	.....	...	.....	Weather favorable. Prospects of crops good. In Burdwan and Bancoorah more rain necessary.	
		Presidency „ ...	.....	...	.....	Weather fair. Cold weather crops coming up well. In Nuddea, cattle disease has appeared in some places.	
		Dacca „ ...	.....	2·2	.....	Weather fair and cool with high winds in Furreedpore. Prospects of crops favorable.	
		Chittagong „ ...	.....	...	.....	Weather fine. Crops good.	
		Cuttack „ ...	.....	Abundant.	.....	Rice crops saved: good average crops expected, except in the Khoorda Sub-Division, where the average will be three-fourths.	
		Chota Nagpore „ ...	.....	...	.....	Weather fine, prospects of crops favorable, except in Maunbhoom, where loss is feared from want of rain.	
		Assam „ ...	.....	...	.....	Weather damp and rainy. Prospects of crops satisfactory.	
		Cooch Behar „ ...	.....	...	.....	Weather seasonable. Crops progressing favorably.	
5	N. W. PROVINCES ...	.....	.....	*Nil.*	November 9 ...	Prospects fair. No change since last report. General out-turn of khurreef rather better than expected.	
6	PUNJAB	Delhi	November 8 ...	*Nil.*	November 9 ...	Khurreef crops almost gathered in. Rubbee sowings going on.	The continued absence of rain is delaying the rubbee sowings on unirrigated lands.
		Julundhur	„ ...	„	„ ...	Want of rain is delaying rubbee sowings. Prices rising.	
		Lahore	„ ...	„	„ ...	Rain much needed. Baree Doab and Sohag Canals flowing.	
		Mooltan	„ ...	„	„ ...	Prospects same as before.	
		Rawulpindee ...	„ ...	„	„ ...	Agricultural prospects good in northern tracts. Rain wanted.	
		Peshawur	„ ...	„	„ ...	Khurreef out-turn expected to be three-fifths of an average one.	
7	OUDH ...	Lucknow	November 8	„	„ ...	.....	Throughout the Province the weather is clear. The khurreef crops are being reaped. The rubbee sowings going on. The rubbee prospects are generally good.
		Fyzabad	„ 9				
8	CENTRAL PROVINCES	Raipore	„ 4 ...	„	„ ...	Crops on high lands will suffer, in low lands good; earlier sowings being reaped. Rubbee sowings progressing. Cattle-disease diminishing.	
		Belaspore	„ ...	„	„ ...	Harvest of early crops plentiful. Rubbee, wheat, and gram sown have come up.	

No.	Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of Agricultural prospects.	Remarks of Local Government or Administration.
	CENTRAL PROVINCES, —*contd.*	Sumbulpore	November 4 ...	*Nil.*	November 9 ...	High land rice crops almost wholly failed, on low lands suffering in parts, but generally protected by available irrigation. Pulse and oil-seeds already injured very severely: will totally fail unless rain falls soon.	
		Jubbulpore	„ 8 ...	„	„ ...	Khurreef crops being cut and rubbee sowings commenced. Prospects of both crops excellent.	
		Saugor	„ ...	.....	„ ...	Cotton and Jowaree suffered from excessive rain.	
		Seonee	„ ...	.....	„ ...	Rubbee sowings nearly completed. Cotton pods developing.	
		Mundla	„ ...	.....	„ ...	Prospects favorable.	
		Nagpore	„ ...	*Nil.*	„ ...	Kodu, Kutkee, and Moong crops reaped. Jowaree in places suffered from want of rain. Rubbee sowings nearly completed. Rain wanted for both rubbee and khurreef crops. Prices rising slightly owing to large demands from Berar and Khandeish.	
		Wurdah	„ ...	... „	„ ...	Prospect of grain and Cotton crops excellent.	
		Hoshungabad ...	„ 9 ...	*Nil.*	„ ...	Prospects generally good.	
		Chindwara ...	„ ...	„	„ ...	Jowaree suffered below Ghats for want of rain.	
		Nursingpore ...	„ ...	„	„ ...	Rubbee sowings nearly completed. Early crops harvested with good out-turn.	
		Nimar ...	„ ...	„	„ ...	Khurreef crops excellent. Rain wanted for rubbee sowings generally. Prospects are favorable, but rain is now wanted.	
		East Berar ...	„ ...	„	„ 9 ...	Cotton and grain in good soil pretty good, but on poor soil withering from want of rain. Picking of new Cotton has commenced, but the crop will scarcely be an average one.	
9	BERAR ...	West Berar. Akola ...	November 6 ...	„	November 9 ...	The failure of rain during the last six weeks has injured the autumn crops throughout the district. In some places there has been a total failure of crops.	The prospect of the crops has never been worse during the year than it is at present. Spring sowings have been tried only very partially, and there is little hope of any spring harvest at all. The wells are generally drying up.
		Booldana ...	„ 4 ...	„	„ „ ...	Crops drying up and Cotton suffering in places where there has been scanty rain.	
		Bassim ...	„ „ ...	„	„ „ ...	The dry weather of the fortnight has affected the khurreef crops still more.	
10	MYSORE ...	Bangalore ...	„ 8 ...	8·88	„ „ ...	Crops continue favorable.	During the greater portion of the past fortnight, the want of rain was felt, but some timely showers during the last few days seem generally to have dispelled any fear for the present.
		Mysore ...	„ 7 ...	1·2	„ „ ...	Crops generally withering.	
		Coorg ...	„ 8 ...	4·	„ „ ...	Crops generally in good condition.	
11	BRITISH BURMAH ...	Akyab	„ 9 ...	3·4	„ 9 ...	Prospects of harvest very satisfactory.	
		Rangoon	„ 8 ...	·95	„ 9 ...	Fair.	
		Maulmein	„ 8 ...	·55	„ 9 ...	Crops good.	
		Thayetmyoo	„ 8 ...	1·45	„ 9 ...	Fair.	
		Tounghoop	„ 8 ...	3·16	„ 9 ...	Good.	

No report received from Central India and Rajpootana and the Cotton Commissioner for the Central Provinces and the Berars.

No. 44 of 1871.

SUPPLEMENT TO

The Gazette of India.

CALCUTTA, SATURDAY, NOVEMBER 18, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time, containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

Non-Subscribers to the GAZETTE *may receive the* SUPPLEMENT *separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.*

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA *is required by Law, of which it has been customary to publish in the* CALCUTTA GAZETTE, *will be included in the* SUPPLEMENT. *For such Orders and Notifications the body of the* GAZETTE *must be looked to.*

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

TELEGRAPH.

No. 439T, dated Simla, 30th October 1871.

From—COLONEL C. H. DICKENS, R.A., Secy. to the Govt. of India, P. W. DEPT.,

To—The Officiating Director General of Telegraphs.

With reference to previous correspondence ending with your letter No. 190, dated 21st September 1871, I am directed to state that His Excellency the Governor General desires that an abstract of the returns of foreign messages, such as is affixed to the monthly returns now submitted, together with a further abstract in the same form as the accompanying abstract prepared in this office, shall be published periodically, and I am to request that such statements, including the returns of international traffic, may be prepared and submitted monthly for publication in the *Gazette of India*.

2. The weekly returns of international traffic hitherto submitted will not now be necessary, and may be discontinued.

ABSTRACTS OF INTERNATIONAL TRAFFIC BY INDO-EUROPEAN AND RED SEA LINES.

JANUARY 1871.

	Via Russia.			Via Turkey.			Via Red Sea.		
	No. of Messages.	Indian value.		No. of Messages.	Indian value.		No. of Messages.	Indian value.	
		Rs.	A.		Rs.	A.		Rs.	A.
Sent	338	1,871	12	2392	7,207	0	278	6,068	3
Received	2292	14,264	7	320	2,089	14	1539	1,692	4
TOTAL ...	2630	16,136	3	2712	9,296	14	1817	7,760	7

FEBRUARY 1871.

	Via Russia.			Via Turkey.			Via Red Sea.		
	No. of Messages.	Indian value.		No. of Messages.	Indian value.		No. of Messages.	Indian value.	
		Rs.	A.		Rs.	A.		Rs.	A.
Sent	447	2,421	8	1298	6,271	0	744	2,861	1
Received	1650	10,053	7	562	2,697	13	960	2,532	14
TOTAL ...	2097	12,474	15	1860	8,968	13	1704	5,393	15

MARCH 1871.

Sent	573	3,708	0	1424	6,830	12	1234	3,949	9
Received	982	5,843	13	291	1,511	15	1721	5,258	10
TOTAL ...	1555	9,551	13	1715	8,342	11	2955	9,208	3

ABSTRACT OF FOREIGN MESSAGES FOR THE MONTH OF APRIL 1871.

DESCRIPTION.	Route. By Indo-European Company Line.			By British Indian Sub-Marine Cable.			*Vid* Turkey.			By British Indian Extension Cable, &c.			Total. Indian.		
	No.	Indian value.		No.	Indian value.		No.	Indian value.		No.	Indian value.		No.	Share of value.	
		Rs.	A.		Rs.	A.		Rs.	A.		Rs.	A.		Rs.	A.
TO AND FROM INDIAN STATIONS.															
Sent ...	356	2,402	3	1103	3,464	9⅓	910	4,469	6	194	726	8	2563	11,062	10⅔
Received ...	584	3,913	15	663	4,979	10	338	1,586	5⅓	204	975	8	1789	11,455	6⅓
TOTAL ...	940	6,316	2	1766	8,444	3⅓	1248	6,055	11⅓	398	1,702	0	4352	22,518	1
TRANSIT MESSAGES.													Transit.		
From East to West ...	...	...	...	537	2,816	4	3	11	4	...	...	...	540	2,827	8
„ West to East	70	319	6	272	1,362	0	100	506	12	...	...	...	442	2,188	2
TOTAL ...	70	319	6	809	4,178	4	103	518	...	...	...	...	982	5,015	10
GRAND TOTAL ...													5334	27,533	11

ABSTRACT OF FOREIGN MESSAGES FOR THE MONTH OF MAY 1871.

TO AND FROM INDIAN STATIONS.															
Sent ...	536	3,845	15	1029	2,927	9	957	4,370	6	173	797	12	2695	11,941	10
Received ...	1217	5,881	2	488	2,943	4	139	1,450	8	221	1,098	10	2065	11,373	8
TOTAL ...	1753	9,727	1	1517	5,870	13	1096	5,820	14	394	1,896	6	4760	23,315	2
TRANSIT MESSAGES.													Transit.		
From East to West ...	...	...	...	539	2,746	14	...	...	...	...	...	...	539	2,746	14
„ West to East	87	432	8	297	1,459	12	121	549	10	...	...	...	505	2,441	14
TOTAL ...	87	432	8	836	4,206	10	121	549	10	...	...	...	1044	5,188	12
GRAND TOTAL ...													5804	28,503	14

ABSTRACT OF FOREIGN MESSAGES FOR THE MONTH OF JUNE 1871.

DESCRIPTION.	Route. *Vid* Teheran.			By British Indian Sub-Marine Cable.			*Vid* Turkey.			By British Indian Extension Cable, &c.			Total. Indian.		
	No.	Indian value.		No.	Indian value.		No.	Indian value.		No.	Indian value.		No.	Share of value.	
		Rs.	A.		Rs.	A.		Rs.	A.		Rs.	A.		Rs.	A.
TO AND FROM INDIAN STATIONS.															
Sent ...	618	3,823	4	973	3,040	2	995	4,094	9	248	1,188	10	2834	12,146	9
Received ...	1078	5,553	6	638	4,935	0	308	1,265	3	242	1,171	10	2266	12,925	3
TOTAL ...	1696	9,376	10	1611	7,975	2	1303	5,359	12	490	2,360	4	5100	25,071	12
													Transit.		
TRANSIT MESSAGES.															
From East to West	...	...	...	808	4,292	6	...	...	...	...	...	...	808	4,292	6
„ West to East	100	411	6	540	2,675	2	116	499	12	...	...	...	756	3,586	4
TOTAL ...	100	411	6	1348	6,967	8	116	499	12	...	...	...	1564	7,878	10
GRAND TOTAL ...													6664	32,950	6

ABSTRACT OF INTERNATIONAL TRAFFIC BY THE INDO-EUROPEAN AND RED SEA LINES FOR THE MONTHS OF JANUARY, FEBRUARY, MARCH, APRIL, MAY, AND JUNE 1871.

ROUTES.	No. of messages from India.	No. of messages to India.	Total number of messages.	Percentage of total No. of messages from India.	Percentage of total No. of messages to India.
Vid Russia	2868	7803	10671	26·8	73·1
Vid Turkey	7976	1958	9934	80·2	19·7
Vid Red Sea	6882	4533	11415	60·2	39·7

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

COMPARATIVE STATEMENT OF IRRIGATION AND RAINFALL, FOR YEARS 1868-69 AND 1869-70, IN CANAL DISTRICTS OF SIND.

ZILLAHS. TALOOKAS.	Area in Acres.	Cultivated Area in Acres.	AREAS IRRIGATED. Fusl Khureef. Total Acres.	Fusl Khureef. In comparison with 1868-69. Increase.	Fusl Khureef. In comparison with 1868-69. Decrease.	Fusl Rubbee. Total Acres.	Fusl Rubbee. In comparison with 1868-69. Increase.	Fusl Rubbee. In comparison with 1868-69. Decrease.	Whole Year 1869-70. Total Acres.	Whole Year 1869-70. In comparison with 1868-69. Increase.	Whole Year 1869-70. In comparison with 1868-69. Decrease.	Percentage of Income or decrease in 1869-70.	1868-69.	1869-70.	Percentage of decrease, 1869-70.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Kurrachee Collectorate Canals.																
Meerpoor Buttora ...	The total area of land situated in different canals above named in the different Talookas cannot be given, as there are no papers or returns to show this.	5,713	5,572	157	...	141	...	595	5,713	...	438	7·66	5·51	24·62	...	No. 52, Pinyaree and its branches, excluding the undermentioned canals.
Beyla		12,210	10,728	843	...	1,482	532	...	12,210	1,375	...	11·26	...	...	...	
Meerpoor Buttora* ...		1,754	16,999	449	...	555	...	390	17,554	59	...	0·34	5·51	24·62	...	*No. 52—2, Mahomawah and its branches, including Syeda, No. 52—7.
Beyla†		3,604	3,150	236	...	454	...	223	3,604	13	...	6·36	...	...	...	†No. 52—29, Gharee and its branches.
Jatha		15,521	15,213	1,820	...	308	158	...	15,521	1,978	...	12·24	...	...	...	No. 52, Goongra and its branches.
TOTAL ...	...	54,602	51,662	3,505	...	2,940	690	1,208	54,602	3,425	438	5·47	...	...	...	
Fullailee Division.																
Fullailee and its branches ...	714,239	145,138	135,013	26,654	...	10,125	4,538	...	145,138	31,192	...	21·50	4·43	17·25	17·25	Increase 12·82.
TOTAL ...	714,239	145,138	135,013	26,654	...	10,125	4,538	...	145,138	31,192	...	21·50	4·43	17·25	17·25	
Rohree Division.																
Halla	22,600	5,767	5,613	325	...	153	142	...	5,767	468	...	7·17	...	...	...	Great Marruck and its branches.
Shadadpoor	255,407	37,650	36,840	12,045	...	810	776	...	37,650	12,820	...	51·25	...	...	...	
TOTAL ...	287,007	43,417	42,453	12,370	...	963	918	...	43,417	13,288	...	43·31	...	...	...	
Ghar Division.																
Larkhana	...	24,249	22,419	...	1,829	1,830	557	...	24,249	...	1,272	5·24				
Lubduria	...	...	...	...	...	...	...	...	...	...	...	...				
Kumber	...	16,861	15,737	279	...	1,124	698	...	16,861	977	...	5·79	5·99	5·77	0·8	
Nowshera	...	951	725	...	43	226	180	...	951	137	...	14·40				
Ruttadhera	...	16,799	15,853	...	2,049	946	904	...	16,799	...	1,145	6·81				
Soojawal	...	12,369	12,075	...	255	294	234	...	12,369	...	21	0·17				
Kukkur	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
TOTAL ...	...	71,229	66,809	279	4,176	4,420	2,573	...	71,229	1,114	2,438	...	...	...	...	
Begaree Division.																
Thool...	337,230	3,545	3,545	217	...	...	...	...	3,545	217	...	56·89	...	...	...	Begaree Canal with branches.
Jacobabad	311,850	36,522	36,302	3,794	...	220	220	...	36,522	4,014	...	10·00	6·12	8·72	...	
Shikarpoor	...	2,519	2,513	...	494	6	...	96	2,519	...	590	23·46	...	...	...	
TOTAL ...	649,080	42,586	42,360	5,811	494	226	220	96	42,586	6,031	590	12·77	6·12	8·72	...	
Eastern Narra.																
Kipra	43,409	21,808	20,122	3,555	...	1,687	69	...	21,808	3,623	...	20·00	5·64	4·32	...	Mitrow Canal and its branches.
Oomerkote	40,680	14,123	11,327	2,693	...	2,797	...	3,508	14,123	...	814	...	...	5·64	...	
TOTAL ...	84,089	35,931	31,449	6,248	...	4,484	69	3,508	35,931	2,809	814	8·00	5·64	...	...	
Kipra	174,192	28,621	5,432	1,867	...	23,190	...	6,387	28,621	...	4,520	...	...	...	...	Narra Flood.
Oomerkote	25,545	6,885	887	582	...	5,998	1,287	...	6,885	1,869	...	37·00	...	...	...	
TOTAL ...	199,737	35,506	6,319	2,449	...	29,188	1,287	6,387	35,506	...	2,651	...	...	...	...	
Kipra	3,000	434	406	20	...	28	28	...	434	4,731	...	13·00	...	...	...	Heranwah.
Kipra	3,500	27	27	27	...	...	...	46	27	...	20	...	...	...	...	Dimwah.
Oomerkote ...	20,978	11,764	8,846	3,919	...	2,918	...	10,284	11,764	...	6,365	...	...	...	..	Thur Canal.
	15,000	5,633	5,272	2,897	...	361	...	5,108	5,633	...	2,211	...	...	...	...	Chore Branch.
	130,696	9,071	8,101	2,658	...	970	...	5,742	9,071	...	3,084	...	...	...	...	OomerkoteBranches.
TOTAL ...	357,000	98,367	60,419	18,219	...	37,948	1,383	31,075	98,367	...	11,473	...	...	...	...	
GRAND TOTAL ...	2,007,326	455,339	398,716	66,838	4,670	56,622	10,322	32,379	455,339	55,050	15,006	8·81	...	...	...	

ABSTRACT.

Kurrachee Collectorate Canals... ...	54,602	51,662	3,505	...	2,940	690	1,208	54,602	3,425	438	5·57	...	..	...	
Fullailee Division... ...	714,239	145,138	135,013	26,654	...	10,125	4,538	...	145,138	31,192	...	21·50	...	...	...
Rohree Division	287,007	43,417	42,453	12,370	...	963	918	...	43,417	13,288	...	43·31	...	...	...
Ghar Division	...	71,229	66,809	279	4,176	4,420	2,573	...	71,229	1,114	2,438	...	...	...	...
Begaree Division	649,080	42,586	42,360	5,811	494	226	220	96	42,586	6,031	590	12·77	...	...	...
Eastern Narra	357,000	98,367	60,419	18,219	...	37,948	1,383	31,075	98,367	...	11,473	...	...		...
TOTAL ...	2,007,326	455,339	398,716	66,838	4,670	56,622	10,322	32,379	455,339	55,050	14,939	8·81	...	...	...

Net Increase, 40,111.

J. LEMESURIER, *Captain, R. E.,*
Acting Supdg. Engr. for Irrigation in Sind.

IRRIGATION OPERATIONS FOR 1869-70 ON THE UNDERMENTIONED CANALS IN SIND.

CANAL DIVISION.	WATER DISTRIBUTED IN JUNE.				NAVIGATION RETURN.		LAND IRRIGATED (APPROXIMATE.)		REMARKS.
	DEPTH IN CANAL REGULATING GAUGE.		GROSS CONSUMPTION, CUBIC FEET PER SECOND.		PRINCIPAL ITEMS OF TRAFFIC.				
	Full supply.	Actual throughout June.	Estimated full supply.	Actual average throughout.	Up.	Down.	Zillah.	Acres.	
Kurrachee.									
Pinyaree	11·70	6·7	3,803	1,618	Returns are not obtainable of the traffic on the canals.	Returns are not obtainable of the traffic on the canals.	Meerpoor Buttora ...	31,166	The canals were not registered in May; hence the actual supply is shown in columns 5 and 7.
Mahmoodah	8·46	4·2	874·39	2191			Beyla ...	26,528	
Gharree	8·75	5·53	205·32	56·65			Jatha	21,321	* The Goongrah is a reservoir and a continuation of the Pinyaree.
Goongrah*	...	...	...	...				...	
Boree Canal Division.		(8th August)							
Great Marruck ...	9·00	6·48	Supply depends on height of Indus.	389·56	Wheat	Badzree	Halla and Shadadpoor ...	43174	
					Barley	Jowaree			
					Gram	Oil			
					Mutt	Teel			
					Ghee	Tobacco, &c. ...			
					Sugar		Hydrabad ...	125,140	
					Cloth		Aliarka Tanda ...	4,510	
					Iron		Goonee ...	146,905	
					Rice, &c. ...		Mohbut Dera ...	46,000	
Fullailee Division.							Buddeena ...	163,300	
					.....	.....	Bagaka Tanda ...	146,800	
Fullailee, with Branches ...	14·00	8·51	7,076	3,118			Oomerkote ...	11,320	
							Daplee ...	73	
Eastern Narra.									
Mitrow Canal	6·00	7·71	560	521·9	None.	None.	Thur and Parker ...	31,448	† No discharges were taken in this year.
Thur Canal	6·00	6·75	500	+	None.	None.	Ditto ...	22,219	

J. LEMESURIER, *Captain, R. E.,*
Acting Supdg. Engr. for Irrigation in Sind.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

IRRIGATION WORKS UNDERTAKEN BY COLONEL RAMSAY IN THE CHILKEA ESTATE OF THE KUMAON BHABUR.

No. 1122 I—C, dated Nynee Tal, the 6th October 1871.

From—COLONEL W. H. GREATHED, R. E., Joint Secretary to the Government, N. W. P., in the P. W. Dept., Irrigation Branch,

To—The Secretary to the Government of India, P. W. DEPT.

In continuation of my letter No. 1009,* dated 4th April, I am desired by His Honor the Lieutenant-Governor to submit, for the information of His Excellency the Governor General in Council, the documents marginally noted,† illustrating the progress which has been made in the irrigation and general improvement of the Chilkea Estate in the Kumaon Bhabur.

* General No. 4133 A—I.

† 1. Map of Chilkea Ilaka.
2. Account of expenditure on irrigation works.
3. Tracing showing the tract between the old Kumaon boundary on the east and the Saweldé on the west.
4. Three plans showing elevation, section, &c., of canals, mills, and bridges.
5. Copy of Commissioner of Kumaon's No. 319—384, dated 7th September 1871.

2. In the enclosed report, Colonel Ramsay records the use to which he has turned the sum of a lakh of rupees granted to him in 1868-69 as an advance for the irrigation of these lands, to be repaid by annual instalments from profits; and relates the general result of the irrigation works constructed in this tract, since 1860-61, when Colonel Ramsay received charge of it.

3. At that time there were only 18 villages, some of them very small **settlements** between the Saweldé and the **Kosee Rivers; no satisfactory irrigation arrangements then existed. There were three or four water-courses** under no general control, **from which the villagers took off water after the rains in any** way they could; but until permanent head-works were established on the right bank of the Kosee, the channels were useless in the rains, and the valuable rice crops now obtained could not be grown.

4. Expending his surplus revenue, year by year, Colonel Ramsay has extended his settlement until now,—109 villages are planted in the tract, 10 miles by 4, which is irrigated between the Saweldé and the Kosee. They pay for land and water revenue a yearly amount of Rs. 33,705, which is annually increasing. The expenditure on irrigation within this period has amounted to Rs. 1,53,465.

5. The irrigation of the Bhabur shows greater results, perhaps, than are exhibited in any other tract of these Provinces: for irrigation there creates life, and permits of settlement and cultivation which would otherwise be impossible. It creates revenue too, and, allowing half proceeds to be for land and half for water, the gross irrigation revenue amounts to 10 per cent. on outlay.

6. At the same time it is to be observed this irrigation is practised under very favorable circumstances. There is plenty of water; the length and capacity of water-courses are small, there are no large and critical works upon them, and they begin to work from their very head. The revenue and irrigation management is under one hand, so that all the resources of the country are available in the construction of the works, and the irrigation officer can always rely on the cordial support of the revenue authorities.

7. These advantages Colonel Ramsay has known full well how to turn to account, and, by skilfully adapting his means to his ends, has overcome, with

infinite energy, patience, and fertility of resource, the very esrious difficulties which beset the enterprise of colonising the Bhabur.

8. The works and lines of channel constructed with the lakh of rupees advanced in 1869 are shown in the accompanying map, and specified in the enclosed list; an account has already been furnished to the Accounts Department.

9. The first instalment of the advance has been punctually repaid, and Colonel Ramsay anticipates no difficulty in accomplishing the entire payment on the terms and within the limits prescribed.

No. 1.

KANYA CANAL.

Length of new Canal, 4 miles, 1,262 feet.

Particulars.	Quantity.	Rate.	Amount	Total.
	Cubic feet.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Excavation	1,190,363	0 5 1	3,793 2 3	
Masonry	302,075	12 13 7½	38,819 0 7	
Levelling, superintendence, &c. ...	...	...	750 0 0	
Timber	..	...	200 0 0	
Contingencies	...	...	250 0 0	
Compensation for injury to crops ...	...	...	162 9 8	43,974 12 1
Total, Kanya Canal ...	...	...	.....	43,974 12 1

No. 2.

MUJHAREE CANAL.

Length of new Channel, 4 miles, 4,699 feet.

Particulars.	Quantity.	Rate.	Amount.	Total.
	Cubic feet.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Excavation	803,363	0 4 2	2,142 15 0	
Masonry	274,300	12 11 7½	34,904 6 2	
Levelling, superintendence, &c. ...	...	...	850 0 0	
Timber	...	...	200 0 0	
Contingencies	...	...	285 0 0	
Compensation for injury to crops ...	...	...	224 11 6	38,607 0 8
Total, Mujharee Canal ...	...	...	...	38,607 0 8

No. 3.

Six Mills on Kanya Canal Line.

Particulars.	Quantity.	Rate.	Amount.	Total.
	Cubic feet.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Excavation	48,552	0 7 10	238 15 0	
Masonry	27,975	10 13 1½	3,025 12 3	
Timber	...	.....	567 8 10	
Iron-roofing	...	.....	180 0 0	
Contingencies	...	.....	36 0 0	4,048 4 1
Total of six Mills on Kanya Canal Line ...	...	.....	.....	4,048 4 1

No. 4.

Two Mills on Mujharee Canal Line.

Particulars.	Quantity.	Rate.	Amount.	Total.
	Cubic feet.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Excavation	16,695	0 8 0	83 8 0	
Masonry	10,175	11 10 7½	1,186 7 0	
Timber	...	.....	189 2 1	
Iron-roofing	...	.....	60 0 0	
Contingencies	...	.....	12 0 0	1,531 1 1
Total of two Mills on Mujharee Canal Line ...	...	.....	.....	1,531 1 1

No. 5.

Saweldé Mill and Canal.

Particulars.	Quantity.	Rate.	Amount.	Total.
	Cubic feet.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Excavation	29,904	0 4 2	79 8 0	
Masonry	9,925	11 0 2½	1,093 2 8	
Timber	...	.....	94 9 5	
Iron-roofing	...	.....	30 0 0	
Contingencies	...	.....	6 0 0	1,303 4 1
Total, Sawelde Mill and Canal	...	.....	.....	1,303 4 1

No. 6.

Belgur Head-work and Canal.

Particulars.	Quantity.	Rate.	Amount.	Total.
	Cubic feet.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Excavation	1,20,927	0 7 10	594 12 3	
Masonry	42,950	11 10 6½	5,006 6 11	
Levelling, superintendence, &c.	...	.....	263 5 4	
Contingencies	...	.....	77 6 6	5,941 15 0
Total, Belgur Head-work and Canal ...	...	.....	.....	5,941 15 0

No. 7.

Dalika Head-work.

Particulars.	Quantity.	Rate.	Amount.	Total.
	Cubic feet.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Excavation	49,661	0 4 6	140 0 0	
Masonry...	27,100	4 0 0	1,083 12 10	1,223 12 10
Total, Dalika Head-work...	...	.....	.....	1,223 12 10

No. 8.

Miscellaneous.

Particulars.	Quantity.	Rate.	Amount.	Total.
	Cubic feet.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Paid Mr. Mathews for tools ...	...	.....	748 8 0	
„ Ahmutty and Co. ditto ...	...	.....	507 8 0	
„ Thomson and Co. ditto ...	...	.....	485 4 0	
Part of carriage of ditto ...	...	.....	237 6 2	1,978 10 2
Six (6) permanent lime-kilns ...	...	.....	.....	1,391 4 0
Total, Miscellaneous ...	...	.....	.....	3,369 14 2

ABSTRACT.

			Rs. A. P.	Rs. A. P.
No. 1.	Cost of	Kanya Canal	43,974 12 1	
„ 2.	„	Mujharee Canal	38,607 0 8	
„ 3.	„	Six Mills on Kanya Canal Line ...	4,048 4 1	
„ 4.	„	Two Mills on Mujharee Canal Line	1,531 1 1	
„ 5.	„	Saweldé Mill and Canal ...	1,303 4 1	
„ 6.	„	Belgur Head-work and Canal, east bank of Rohree	5,941 15 0	
„ 7.	„	Dalika Head-work	1,223 12 10	
„ 8.	„	Miscellaneous	3,369 14 2	100,000 0 0
Total Expenditure on all Canals ...		.....		100,000 0 0

H. RAMSAY, *Colonel,*
Commissioner, Kumaon.

No. 319—384, dated Nynee Tal, the 7th September 1871.

From—Colonel H. Ramsay, Commissioner of the Kumaon Division,

To—The Joint Secy. to the Govt., N. W. Provinces, P. W. Dept., Irrigation Branch.

In continuation of my letter No. 83, dated the 10th April last, I have now the honor to submit a roughly prepared map showing the irrigation masonry channels on the right bank of the Kosee River, on which about Rs. 90,000 were expended during the cold weather of 1869-70. The balance on the tuccavee advance of one lakh, nearly Rs. 10,000, was expended as per margin; but I have been unable, from want of funds, to complete irrigation arrangements in connection with these head-works, therefore I have not sent any map of the country on the *east* bank of the Kosee, or of that on either side of the Dalika River.

	Rs. A. P.
Head-work on east bank of Kosee ...	5,941 15 0
Dalika River head-work	1,223 12 10
Saweldé Mills	1,303 4 1
Lime-kilns	1,391 4 0
Total ...	9,860 3 11

2. I send a tracing prepared from the different survey maps of Captain Vanrenen, showing the tract between the old Kumaon boundary on the east and the Saweldé on the west. A large portion of this on the right bank of the Kosee River belongs to "Jhupa Ganga," a settled estate with which I could not interfere. I also submit an elevation and section of one of the water-mills used in the Bhabur, of some of the bridges and culverts, which added considerably to the cost of the work, and cross sections of different portions of the canals made.

3. When the Chilkea Ilaka was placed under me in 1860, there were no satisfactory irrigation arrangements at all; after the rains the villages took off water in any way they could. One large water-course, called the Nuthee-wala gool, was under the Collector of Moradabad. It took water down to some Turai villages below the Bhabur. Another water-course, called the Kanya gool, watered three or four small villages, and a third, called the Mujharee gool, irrigated Chilkea village, and some small patches of cultivation above and below it. The Nuthee-wala and Kanya gools were rendered useless by the first flood, and Mujharee gool sometimes was closed, at other times it threatened to wash away the country according to the direction of the main stream of the Kosee.

4. I was authorized to pay the Government demand into the treasury, and expend all I could realize in excess of that on the improvement of the Chilkea tract. I first made a permanent head-work which enabled me to keep a constant supply of water in the Nuthee-wala and Kanya gools. I also improved the Mujharee, and marked off a number of villages which could be irrigated from these water-courses, and with the surplus receipts I improved the then existing state of irrigation, as far as possible, erecting mills, as these works progressed to meet the wants of the increasing population.

5. Since 1860-61 I have expended on irrigation works in the tract shown in the accompanying map, up to the end of 1869-70, the sum of Rs. 1,53,465, but a good deal of this was expended on temporary arrangements which have now been dispensed with. I had not sufficient funds to undertake any complete scheme of irrigation, and was obliged to make money by increasing cultivation, which could only be effected by supplying the means of irrigation. I therefore made a great many water-courses, and constructed small masonry works, where absolutely necessary, as far as possible, with a view to their suiting the permanent works now completed, and, while the masonry channels were being made, I could not interfere with existing irrigation channels without injury to established villages; therefore, below the head-work I was generally obliged to adopt a new line. Many of the old channels thus became useless, and cannot now be considered as part of the present canals; thus the permanent irrigation works cannot be said to have cost Rs. 1,53,465, although that sum has been actually expended in supplying the means of irrigation from first to last. You had an opportunity of examining the most expensive part of these works in March 1870, and I am happy to state that they have stood the test of two seasons of unusually heavy rain without suffering at all, and the whole of the works on the west bank of the Kosee River have been a complete success.

6. There were eighteen villages, some of them very small settlements, in existence when this tract was placed under my charge. There are now one hundred and nine villages, and the revenue realized from land and mill-rents in the year ending 30th September 1870 was Rs. 33,705. As cultivation progresses the returns will increase. The Government demand on account of the tract under direct management is Rs. 2,824.

7. The greater part of the soil between the Kosee and Saweldé Rivers is very sandy, and the loss of water from absorption was so great that, without masonry channels, I saw it was impossible to increase the cultivation to any great extent, because the river became very low in March, when water was most urgently required.

8. By arrangements now made, I can irrigate the whole of the tract between the Kosee and the Saweldé Rivers. The Kanya masonry channel is 4¼ miles in length. It feeds the Nuthee-wala gool by an off-shoot which can turn four mills. Up to this point it is 15 feet wide, and beyond it is only 8 feet wide, till it sends off another stream of water, when it is reduced to 4 feet, which is sufficient for the number of villages it is required to irrigate. The Chilkea Canal goes down the Kasheepoor Road, and irrigates on the east of the line of villages on the Nuthee-wala gool, while on the east it waters all land up to the Mujharee gool. This channel is close upon five miles long, and works three mills. At Chilkea village, a branch turns off to the west and goes down the Juspoor Road. I can supply the Mujharee gool from this channel at Chilkea, and irrigate all the land on the east bank of that water-course.

9. By bringing the Mujharee water-course under command, any quantity of water can now be sent down by it in the rains when the villages use such a quantity of water for rice, while the masonry channel contains an abundant supply for the land west of the Mujharee gool.

10. Considerable progress has already been made on the east bank of the Kosee and of the Dalika by making temporary arrangements; but until I can secure a permanent supply of water in the rains, I do not expect to make much way. I hope, during the ensuing cold weather, to connect the head-work on the left bank of the Kosee with the high land from which water can be sent in any direction between the Kosse and Dalika. In the same way I shall try to make the Dalika head-work give a constant supply during the rains, by passing the water under some ravines, and getting it on to high land beyond the reach of the Dalika River, which last year changed its course and turned away much to the east.

11. Most of the villages shown in the map below Chilkea are newly settled. Each village has a small supply of water constantly running. This is regulated by a small gate made of sheet-iron, which is raised or lowered according to the extent of cultivation, and fixed by a padlock, for which the village is responsible. In the rains the gates are opened altogether, as the supply of water is abundant.

12. I cannot say correctly what number of cultivated beegahs there are in the Chilkea Ilaka, as the new villages in the lower part have not been measured or assessed; but there is no doubt I shall be able to pay up the instalments specified in my letter No. 9C, dated 27th March 1870, as per margin, and I have already paid the first instalment of Rs. 10,000, with Rs. 5,000 interest.

					Rs.
Before the 31st March 1871, with interest				...	10,000
Ditto	ditto	1872,	ditto	...	20,000
Ditto	ditto	1873,	ditto	...	20,000
Ditto	ditto	1874,	ditto	...	25,000
Ditto	ditto	1875,	ditto	...	25,000
			TOTAL	...	100,000

13. In putting down new villages, I allow the cultivators to have the land free for two years; the third year, the cultivation is assessed at four annas a *kutcha* beegah,* and it increases one anna every year until it reaches eight annas a beegah.

* 6. an acre, Rs. 1-8-0.

No. 662 I, dated 28th October 1871.

From—COLONEL C. H. DICKENS, R. A., Secretary to the Govt. of India, P. W. DEPT.,

To—The Joint Secy. to Govt., N. W. P., P. W. Dept., Irrigation Branch.

I am instructed by His Excellency the Governor General to acknowledge the receipt of your letter No. 1122 I—C of the 6th instant, submitting for information documents illustrating the progress which has been made in the irrigation and improvement of the Chilkea Estate in the Kumaon Bhabur, and to express His Excellency's satisfaction at the results exhibited. I am to request that Colonel Ramsay may be congratulated on the success of the undertaking.

2. The papers will be published in the *Gazette of India*, and copies forwarded to the Secretary of State for information.

3. The documents in original received with the letter under reply are herewith returned.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

IRRIGATION OPERATIONS OF FUSL KHURREEF IN THE PUNJAB UP TO 31ST AUGUST 1871.

CANAL DIVISION.	WATER DISTRIBUTED DURING AUGUST 1871.				NAVIGATION RETURN CANAL.		LAND IRRIGATED (APPROXIMATE).		RAINFALL.		CHIEF CROPS (APPROXIMATE).		REMARKS.
	DEPTH IN CANAL AT REGULATING GAUGE.		GROSS CONSUMPTION C. FT. PER SECOND.		PRINCIPAL ITEMS OF TRAFFIC.								
	Full Supply.	Actual throughout August.	Estimated Full Supply.	Actual average throughout August.	Up.	Down.	ZILLAH.	ACRES.	AVERAGE.	DURING MONTH.	NAME.	AREA IN ACRES.	
BAREE DOAB CANAL. 1st Division ...	4·90	2·45	...	914·69	...	...	Goordaspoor	7,697	8·65	1·40	Cotton ...	15,123	27·42 cubic feet per second passed out of the Escapes.
2d Div. Main Branch, Lower	4·60	1·60	3073·6	357·82	...	...	Umritsur ...	12,557	...	...	Rice ...	8,548	The approximate decrease is 22,385 acres. This is attributed in the 1st Division, Baree Doab Canal, to the enhanced rates and water advantage rate, and in the 2nd Division to the closure of the canal during the very severe floods on which separate reports were made.
2d Div. Lahore Branch ...	3·30	1·88		344·01	...	...	Lahore ...	24,948	6·66	1·35	Sugar-cane	5,912	
											Others ...	15,619	
TOTAL B. D. CANAL ...	...	...	3073·6	1616·52	*Nil*	*Nil*	...	45,202	...	...	...	45,202	
CORRESPONDING PERIOD, LAST YEAR ...	...	...	...	2946·77	*Nil*	*Nil*	...	67,587	...	...	...	67,587	
WESTERN JUMNA CANAL. Kurnaul Division ...	4·33	*Nil*		*Nil*	...	177.399	Umballa ...	1,153	13·82	19·99			
Delhi " ...	4·40	2·55		390·99	...	Khuriers,	Kurnaul ...	26,246	6·03	4·22	Cotton ...	77,711	69·04 cubic feet per second passed through Escape. The head of the canal was closed for 28 days during the month.
Hansi " ...	8·80	6·60	2546·00	385·00	...	Bullies,	Delhi ...	30,926	...	6·80	Rice ...	15,002	
Do. Bulla Head ...	8·40	6·30		211·00	...	and Logs.	Rohtuck ...	33,975	3·80	2·10	Sugar-cane	27,618	
							Hissar ...	23,403	4·30	...	Others ...	7,689	
							Jheend ...	12,151	...	0·80			
							Bikaneer ...	166	...	...			
TOTAL W. J. CANALS ...	...	...	2546·00	986·99	...	177.399	..	1,28,020	...	...	...	1,28,020	The decrease on the Western Jumna Canal is about 11,352 acres; this is attributed to the large rainfall which to some extent enabled the crops to be raised without the assistance of canal irrigation.
CORRESPONDING PERIOD, LAST YEAR ...	...	...	...	1412·58	...	157,819	...	1,39,372	...	...	...	1,39,372	
INUNDATION CANALS. Upper Sutlej Division ...	...	...	...	...	...	...	Lahore ...	6,000		0·25	Detail not obtainable for want of establishment.		
Lower Sutlej and Chenab	...	...	...	...	...	...	Montgomery	45,000	...	0·27			
Indus Canals ...	...	...	...	...	..	...	Mooltan ...	1,40,409	1·073	0·25			
							Dera Ghazee Khan ...	1,70,000	...	...			
TOTAL INUNDATION CANALS ...	...	...	..	...	..	..	...	3,61,409	...	...	...	3,61,409	
CORRESPONDING PERIOD, LAST YEAR ..	...	...	...	...	...	...	...	3,39,942	...	...	...	3,39,942	In irrigation from the Inundation Canals shows an increase of 21,467 acres.
DELHI AND GOORGAON WORKS ..	...	...	...	...	...	...	...	*Nil*	...	...	...	*Nil.*	This calls for no special remark.
TOTAL DELHI AND GOORGAON WORKS ...	...	...	...	...	...	...	...	*Nil*	...	...	...	*Nil.*	
PERENNIAL CANAL CORRESPONDING LAST YEAR ...	...	...	...		...	1,57,819	...	2,06,959	...	...	...	2,06,959	
PERENNIAL CANAL GRAND TOTAL ...	...	...	...	...	...	1,77,399	...	1,73,222	...	...	...	1,73,222	

LAHORE,
The 2nd November 1871.

W. BROADFOOT, *Lieut., R.E.,*
Asst. Secy. to Govt., Punjab, P. W. D. Irrign. Branch.

Printed and Published for the GOVT. OF INDIA *at the Office of* SUPDT. GOVT. PRINTING, 8, *Hastings Street, Calcutta.*

No. 45 of 1871.

SUPPLEMENT TO

The Gazette of India.

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OFFICIAL PAPERS.

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GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

REPORTS ON THE STATE OF THE SEASON AND PROSPECTS OF THE CROPS.

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
MADRAS ...	Masulipatam ...	November 22 ...	1·62	November 23 ...	Crops still suffering, and yield below average; grain exported to Hydrabad; price of paddy rising; canals low; rain insufficient.	Government consider prospects of season and market generally good, but in Northern Cirkars monsoon has failed. Much loss from drought in Ganjam and Vizagapatam. Irrigation in Godavery and Kistna Deltas affected; stocks of grain large, but demand for Nizam's country extensive. Prospects in southern districts very favorable; monsoon abundant. Loss from storm; local grain stocks believed to be large. But foreign demand extensive, and prices tending to rise from low level.
	Negapatam ...	„ ...	4·98	„ ...	Prospects injured by late gale. Prices rising.	
	Kurnool ...	„ ...	·13	„ ...	Dry crops improving; grain exported to Hydrabad; prices rising.	
	Trichinopoly ...	„ ...	3·6	„ ...	Crops flourishing; much damage in places by storm; harvest result moderate; prices steady.	
	Calicut ...	„ 21 ...	5·68	„ ..	More rain needed; crops flourishing. Prices low but rising.	
	Dharwar	„ 22 ...	1·3	„ 23 ...	Early crops, except rice, in good condition. Jowaree suffering in a few places from heavy dews; late crops, including cotton, are promising. Scarcity of water in a few places in Hangul and Bunkapoor talookas.	
	Kulladghee	„ ...	*Nil.*	„ ...	All crops middling.	
BOMBAY ...	Belgaum	„ ...	1·5	„ ...	Early crops indifferent; late good; cotton promising.	
	Goozerat	„ ...	2	„ ...	Late crops favorable; early cotton suffered somewhat, later improved; cotton prospects good.	
	Khandeish and Nassick ...	„ ...	50	„ ..	Early and late crops middling; cotton unfavorable.	
	Deccan	„ ...	1	„ ...	Cotton unfavorable; rubbee crops slightly improving.	
SIND ...	Kurrachee	„ ...	0·2	„ ...	Cotton fair; grain good; rubbee sowing in progress.	
	Hyderabad	„ ...	0·49	„ ...	River four feet five inches above zero. District healthy; weather cold; prices as before.	No rain in Upper Sind. Inundation crops good; harvest operations in progress. Cotton in Lower Sind indifferent, in Central and Upper Sind favorable.
	Patna Division ...	November 22 ...	...	November 23 ...	Weather fine and dry. Rice crop being cut. Cold weather crops being sown. All crops promising.	
	Bhaugulpore „ ...	„ ...	...	„ ...	Weather fair. Crops in Bhaugulpore very good; in Monghyr want of rain has caused some damage to high land rice; in Purneah good, where not damaged by floods.	
	Rajshahye „ ...	„ ...	...	„ ...	Weather cool. Crops generally very good. In Dinagepore high land rice has suffered from want of rain.	
	Burdwan „ ...	„ ...	...	„ ...	Weather fine and cool. Amun about to be reaped. Winter crops flourishing. In Bancoorah crops suffering from want of rain.	
	Presidency „ ...	„ ...	...	„ ...	Weather fine and sunny. Cold weather crops favourable, but more rain required.	
BENGAL ...	Dacca „ ...	„ ...	*Nil.*	„ ...	Weather fair and cool. Prospects of crops continue to be good.	State and prospects of crops altogether very favourable.
	Chittagong „ ...	„ ...	...	„ ...	Weather fine. Crops good. In Chittagong some damage caused by insects at Rangonia.	
	Cuttack „ ...	„ ...	*Nil.*	„ ...	Weather hot. Harvest commenced. Out-turn good, except in Pooree where some loss has been caused by drought, and price of rice is rising.	
	Chota Nagpore „ ...	„ ...	...	„ ...	Weather dry. Crops in good state, except in Maunbhoom, where want of rain has caused some damage both to high and low land rice.	
	Assam „ ...	„ ...	...	„ ...	Weather cool and pleasant. Prospects of crop satisfactory.	
	Cooch Behar „ ...	„ ...	...	„ ...	Weather good, except in the Darjeeling terai. Rice on the Darjeeling plains suffering from want of rain. Crops on the hills favourable.	
N. W. PROVINCES ...	...	„ ...	*Nil.*	„ ...	....	Prospects as before. Khureef pretty fair. Breadth of public sowings large.
PUNJAB ...	Delhi ...	November 22 ...	No rain	November 22	Weather cloudy for a day or two, but now clear.	
	Umballa ...	„ ...	„	„ ...	Rubbee prospects unfavorable.	
	Jullundhur ...	„ ...	„	„ ...	Want of rain interferes with the preparation of rubbee harvest.	
	Lahore ...	„ ...	„	„ ..	Rain much needed. Baree Doab and Sohag canals flowing.	
	Mooltan ...	„ .	A few drops of rain.	„ ..	Agricultural prospects same as before.	Rubbee prospects unfavorable, owing to continued absence of rain.
	Rawul Pindee ...	„ ...	No rain	„ ...	Rain urgently wanted.	
	Peshawur ..	„ ..	„	„ ..	Khureef nearly reaped. Rubbee sowing commenced. Out-turn expected to be about three-fifths of an average one.	

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
OUDH ...	Lucknow ...	November 22 ...	*Nil.*	November 20...	.....	Throughout the province the weather is clear. The khureef crops are being reaped. The rubbee sowings are going on. The rubbee prospects are generally good.
	Fyzabad ...	„ ...	„	„ ...		
CENTRAL PROVINCES ...	Raipore	November 18 ...	*Nil.*	November 23 ...	Loss of one-eighth rice and kodu crops anticipated. Inferior sorts of rice cut and stocked. Rubbee sowings almost completed, but the hardness of the upper soil has involved the partial abandonment of wheat lands. Oil-seed crops favorable. Cattle-disease dying out.	
	Belaspore	.....	...	„ ...	Weather fair with cloudless sky. Rice nearly all harvested; out-turn plentiful. Rubbee sowings progressing favorably.	
	Sambulpore	.....	*Nil.*	„ ...	Prospects of khureef same as last fortnight, rice on low lands being cut with promise of fair out-turn; pulses failed entirely.	
	Nagpore	November 22 ...	*Nil.*	„ ...	Rubbee sowings completed and crops in thriving condition. Jowaree poor through want of rain, which is anxiously looked for. Tur slightly damaged by late cloudy weather. Prices have risen owing to large exports towards Khandeish.	
	Wurdah	.....	Slight.	„ ...	Cereals have suffered slightly from drought, but the cotton crop is good.	
	Jubbulpore	.....	*Nil.*	„ ..	Khureef excellent and prospects of rubbee good. Rubbee sowings progressing briskly.	
	Saugor	.. ...	...	„ ...	Rubbee sowing completed, but some land abandoned through hardness. Rain much wanted.	
	Hoshungabad ...	.....	*Nil.*	„ ...	Hot and dry. Rubbee sown under circumstances not quite so promising as last fortnight.	
	Chindwara	.....	Slight showers in places.	„ ...	More rain wanted for standing khureef and recently sown rubbee.	
	Baitool	.....	1·21	„ ...	Prospects excellent.	
	Nimar	.....	·12	„ ...	Prospects of khureef good. Rubbee not good.	
	Nursingpore... ...	.....	*Nil.*	„ ...	Cloudy and sultry; rain wanted. Rubbee sowings completed, and crops above ground.	
BERAR ...	East Berar	November 23 ...	·80	November 23 ...	New cotton is coming in to market. Rubbee crops are flourishing from recent rain. Prospects favorable: cotton and jowaree crops are about twenty-five per cent. under average.	
	West Berar.: Akola	November 22 ...	2	November 22 ...	The rain is favorable to the spring crops, but not to the crops now ripe.	The fall of rain during the fortnight was only partial, but it has improved agricultural prospects in giving some hope of a spring harvest. The wells are still very low, and more rain is required, not only for them, but also for spring harvest.
	Other parts ...	...	·84			
	Boldana ...	„ 18 ...	1·40	„ ...	Has benefited the Rubbee crops, but more rain wanted.	
	Bassim ...	„ ...	...	„ ...	Khureef crops have all suffered more or less, and in parts entirely failed. Rubbee crops germinating. Rain much needed.	
	In one Talook ...	...	·85			
	In others ...	...	·3			
MYSORE AND COORG ...	Bangalore ...	November 23 ...	·61	November 23 ...	Crops thriving and prospects favorable.	Early Raggee crops being harvested. Generally agricultural prospects are favorable.
	Mysore ...	„ 21 ...	1·77	„ ...	Crops thriving in all sub-divisions.	
	Coorg ...	„ 23 ...	3·64	„ ...	Paddy crops thriving. Raggee harvested, and out-turn good. Coffee prospects favorable: cardamoms plentiful, but partially injured by excessive rains.	
BRITISH BURMAH ...	Amherst	November 22 ...	*Nil.*	November 23 ...	Agricultural prospects fair.	
	Thayetmyo ...	„ ...	„	„ ...		
	Rangoon	„ 23 ...	„	„ ...		
CENTRAL INDIA ...	Indore	November ...	·79	November ...	Prospects good.	
	Gwalior	„ 22 ...	·4	„ ...	Prospects favorable.	
	Rutlam	.....	·84	„ ...	Agricultural prospects improved.	
RAJPOOTANA ...	Nusseerabad ...	.. ...	...	„ 21 ...	.....	Weather unprecedentedly warm for the season. Throughout Rajpootana early cessation of rains and dryness of tanks has prevented rubbee sowings in Meywar and Marwar. Elsewhere east of Arabullees they have been general, and young wheat is sprouting. During the last week partially distributed thunder showers have been frequent, doing good to young crops, but rather late for gram.

No report received from the Cotton Commissioner for the Central Provinces and the Berars.

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The issue of this Supplement has been delayed, owing to several alterations having been received by the Press at too late an hour for despatch with the *Gazette* itself.

of 1871.

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GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

CULTIVATION OF THE DATE-PALM IN OUDH.

Nos. 202-203.

Extract from the Proceedings of the Government of India in the Department of Agriculture, Revenue, and Commerce, dated Fort William, the 30th November 1871.

[AGRICULTURE AND HORTICULTURE.]

Read the under-mentioned correspondence regarding the cultivation of the date-palm in Oudh :—

To Chief Commissioner of Oudh, No. 115, dated 3rd August 1871.
From „ „ „ „ 3749, „ 12th „ „
To „ „ „ „ 110, „ 30th „ „
From „ „ „ „ 4827, „ 19th October 1871.

RESOLUTION.

OBSERVATIONS.—So far as the experiment of introducing the superior varieties of the date-palm into Oudh has yet proceeded, it appears to promise ultimate success. It is desirable to ensure, for some years to come, a regular supply of seeds and offshoots of the better kinds in view to extending the experiment.

ORDER.—Ordered, that a copy of this Resolution be forwarded to the Government of Bombay, with reference to the correspondence ending with the letter addressed to that Government by the Chief Commissioner of Oudh, No. 3303, dated 13th July last, and with a request that arrangements may be made with the Political Resident in the Persian Gulf for a regular yearly supply of about one cwt. of seeds and five cwts. of small offshoots of the best descriptions, to be forwarded direct from Bombay to Lucknow, intimation of each despatch being also sent to the Government of India.

Ordered also, that a copy of this Resolution be forwarded to the Chief Commissioner of Oudh, with a request that every endeavor may be made to render the experiment a success, that all District Officers be required to maintain a correct record of the results obtained, and that a yearly report of the progress of the experiment may be submitted to the Government of India on or before the 1st August of each year, giving, amongst other particulars, the total number of plants derived (1*st*) from seeds, and (2*nd*) from offshoots of each year's sowing and planting alive and in good condition on the 1st of July immediately preceding the transmission of the report.

Ordered further, that this Resolution and a précis of the papers above referred to be published in the Supplement to the *Gazette of India* for general information.

(True Extract)
J. GEOGHEGAN,
for *Secretary to the Government of India.*

Cultivation of Date-palm in Oudh.

In September 1868, Dr. Bonavia addressed a letter to the Chief Commissioner of Oudh, suggesting the advisability of introducing into Upper India date-palms of a sort superior to what is commonly known amongst the natives as "Khajoor." This letter runs as follows:

1. The common date-palm (*Phœnix sylvestris*) thrives well without any care throughout Upper India. The fruit of this is small, and has scarcely any pulp. Natives nevertheless eat it; this kind of palm is called by them "Khajoor."

2. Some short time ago I bought some fresh yellow-colored dates, which the seller called "Chohara." I am inclined to think that the tree which bore them must have been raised from the seed of the dry shrivelled dates which come from Cabool. They were much larger and much more pulpy than the fruit of the common "Khajoor" palm; and they further prove that the soil of Upper India is capable of nourishing a far superior date-palm than the common one.

3. Mr. Palgrave, in his book of travels through Central and Eastern Arabia, mentions several varieties of date-palms (*Phœnix dactylifera*) which produce delicious fruit. And I think an attempt should be made to introduce extensively this valuable date-palm into Upper India.

4. There does not appear any difficulty in importing from the Persian Gulf a cask of the best date stones freshly collected, through the consular agencies, by way of Bombay or even Calcutta. If the first lot germinate well, then I would suggest that larger quantities be imported and disseminated among cultivators throughout Upper India.

5. The latitude of Central Arabia corresponds pretty nearly to that of Upper India, and, according to Palgrave's accounts, the date-palms grow where they can get sufficient moisture, and not at all on the dry desert. I am therefore inclined to think that not only the latitude, but also the soil and moisture of Upper India, would be likely to suit this date-palm. But this can only be ascertained by a direct experiment. Moreover, as a date-palm of the same genus already thrives here, and as I have seen superior dates in the Lucknow bazaar, I think the subject offers reasonable hope of success, and is sufficiently important to merit a trial. If superior kinds of date-plams could be extensively introduced into Upper India, they might contribute considerably, when the trees would begin to fruit, in mitigating famines. They might be grown on broken ground where crops could not be grown, and where the moisture of the rainy season would be sufficient for the growth of the trees throughout the whole year. The facility of steam communication between the Persian Gulf and Bombay would ensure the date stones arriving quickly and in a germinating condition.

As recommended by Dr. Bonavia, an application was made (through the Bombay Government) to the Political Resident in the Persian Gulf for a supply of stones of all varieties of the date-palm, especially the Hasa dates, described by Mr. Palgrave in his book of travels. It was also requested that the stones might be sent so as to reach Lucknow in time for sowing in the hot weather, which was considered to be the proper season for the purpose.

In the cold weather of 1868-69, a box containing date stones of nine varieties (as per margin) was received from the Persian Gulf. In May 1869, Dr. Bonavia reported thus: "All the seeds sown in the Horticultural Garden have germinated and are thriving well, and the majority of those distributed to the various Deputy Commissioners (in Oudh) and other parties have also germinated."

1. "Seesee" from Dashtee.
2. "Kheneizee" from Dashtee.
3. "Khedrowee" from Basreh.
4. "Zeynadheenee" from Dashtee.
5. "Kaspp" from Dashtee.
6. "Ganther" from Basreh.
7. "Kabkab" from Dashtee.
8. "Samaroon" from Basreh.
9. "Hulowee" from Basreh.

In submitting the above report, Dr. Bonavia suggested that a larger supply of the best kinds of date stones should be procured from the same source in the month of January, and that the supply should be kept up for several years until the whole province was well stocked. From enquiries made and specimens seen by him, he entertained no doubt of the possibility of introducing the date-palm extensively over the whole of North-Western India. Accordingly an application was made to the Political Resident through the Government of Bombay, and in November 1869 a further supply was received. This supply consisted of 23 species or varieties, the quantity of each of which is given below:—

				lbs.
1	packet of dates	(Kheneizee)	weighing	8
1	„	(Kabkab)	„	8
1	„	(Kandy)	„	8
1	„	(Sheker)	„	8
1	„	(Ganthar)	„	8
1	„	(Hellow)	„	8
1	„	(Maksheel)	„	8
1	„	(Kosh Sharek)	„	8
1	„	(Sheik Aulee)	„	8
1	„	(Sheereenee)	„	8
1	„	(Kharoo)	„	8
1	„	(Jouzee)	„	8
1	„	(Chehel Gezzee)	„	8
1	„	(Kathoo Shehabee)	„	8
1	„	(Nereedhenee)	„	8
1	„	(Shahoonee)	„	8
1	„	(Kayedee)	„	8
1	„	(Seesee)	„	8
1	„	(Rash)	„	8
1	„	'Kharek Gothoo)	„	8
1	Bag of date seeds from Bahrein		„	7
1	„ „ „	„	„	6
1	„ „ „	Tungestoon	„	1

In forwarding the samples specified above, the Political Resident furnished a paper by his uncovenanted assistant, Mr. J. C. Edwardes, describing the process of cultivating the date-palm in the vicinity of Bushire, and containing some information connected with its growth, produce, price, &c. This paper runs as follows:—

Offshoots, which sprout around the foot of the female tree, are procured from Basreh, Kateef, or Bahrein, and transplanted where the cultivator may desire to have a date grove. These offshoots may be procured of all sizes, but the smaller ones, say one foot high, are preferred, as the chances of injury from the transplanting are less than those of a larger size. After being transplanted they require to be watered daily for two or three years. The soil in which they are transplanted should be soft, and the base of the plant surrounded with manure. The manure used in these parts for this purpose is horse dung, mixed with earth, and allowed to remain for a year before being used.

Where water is very plentiful, these offshoots are known to have sprung up rapidly, and borne fruit within four or five years. But where water is scarce and the soil hard, ten or twelve years elapse before any signs of fruit are visible.

Opinions differ in regard to the rearing of date trees from seed. Some aver that the trees thus reared never come to perfection, others that they do and bear fruit, but are generally weak and never satisfactory. It has also been suggested that if the date seed be planted with the fruit, it would germinate sooner and thrive better than if the seed were sown alone. But all agree that offshoots are

Chief of Tungestoon's letter of and Her Majesty's Vice-Consul, Basreh's No. 47 of 25th August 1869.
Chief of Dashtee.

the best, inasmuch as they take less time to grow, and are by far more strong and productive than the trees reared from seed. These offshoots "are extremely hardy and may remain for eight or ten weeks exposed without injury. Their average weight is about six pounds."

The date tree first shows its blossoms in February: these sprout around the heart of the tree in strong covers, very much resembling sword scabbards. They split about March and show a bunch of blossoms, milky white in color. The cultivator has now to decide what number of bunches he should leave on the tree, and withdraws the superabundance. The number of bunch blossoms on each tree varies from twelve to twenty-four, but it is seldom that more than twelve are allowed to remain for fruit.

At this period, also, the cultivator has to impregnate the blossoms of the female tree by joining thereto some portion of the blossom of the male tree. This is done by simply depositing a sprig or two from the male into a bunch of the female blossom, and tying the bunch up. The male tree is distinguishable by its blossom, which is of a reddish tinge, while that of the female is milky white. The blossom of the male tree is only used for impregnating, and does not turn into fruit; as the blossom comes to perfection, it is said to turn into a dry powder. It is even averred that in places where the date-palm grows thick together, the wind scatters the powder of the male blossom, and that the female trees thus become impregnated with it, saving the cultivator further trouble on this head.

When, through neglect or oversight, the female tree fails to be impregnated, it is asserted that the fruit it bears does not come to perfection, is seedless, and insipid.

The blossom of the date tree is known in Persian by the name of Tharch, the process of impregnating Boo-dadun, the male tree Nur, the female Madeh.

About May the fruit begins to form, and from this time to September when the fruit is perfectly ripe, the tree sheds the superabundance, which is used as food by the proprietor, or those he employs to watch his property. At this period the fruit is known as Khomal, and is green in color.

In June and July the fruit is known as Kharek, and is either red or yellow in color. It is now fit to be eaten, and where marts are close, such quantities as are saleable are cut down for the purpose.

In August the date becomes soft and juicy, it is now known as Rothab, and sold in the bazaars as food, but is not yet in a fit state for preservation, as, if kept for two or three days, it would turn sour.

In September the date is known as "Khoorma." It is now in a fit state for preservation. After being taken off the tree, it is gathered into a tank or trough and exposed to the air and sun, where it throws off its extra juice and sufficiently hardens to allow of its being packed up in baskets and prepared for exportation.

The juice is gathered and stowed in skins or jars. It is called "Dooshab," and is used by the poorer classes in lieu of sugar.

This juice is also used in preserving dates in jars; this is done by mixing therewith sesame seed, ginger powder, and the kernels of walnuts. This preserve is called Khoorma Sheera, and is much prized both for use in the Persian Gulf and for exportation.

There is a species of date called "Bereymie," which does not ripen beyond the Kharek stage. The mode of preserving this has been to boil it well in water, and then to expose it to the sun and air till hardened. If well packed and preserved from damp, this will keep for some time, but if kept in air-tight tins might keep for an indefinite period in a dry climate: this is called "Kharek Pokhta."

Another species, the Záhidi, does not ripen beyond the Rothab stage. In fact, it ceases to progress between the Kharek and Rothab, and is left to remain on the tree till hardened by the sun and atmosphere. It is then cut down and packed in baskets. This species is not much used for food, as it finds a more profitable mart in India, where it is much sought after by distillers of arrack.

There are more than a hundred varieties of date known by different names, which it would not be easy to enumerate or describe, nor would there be much utility in doing so, for they would only be understood by the natives of these parts, to whom it is a matter of great consequence to know the name of the date they purchase, as prices are invariably regulated thereby. As an example I marginally enumerate the species of dates received as samples from the Chief of Dashtee, which may be said to comprise about all the varieties findable in this place, but in Bahrein, Kateef, El Hassa, and Basreh there are a great many more kinds, all distinguishable by separate appellation.

Kheneyzee.	Kharoo.
Kubkáb.	Jouzee.
Kandy.	Chehel Gezzee.
Sheker.	Khatoo Shehabee.
Ganthar.	Neeredhenee.
Hellow.	Shahconee.
Maktoob.	Kayedee.
Khushharek.	Seesee.
Sheik Alee.	Rash.
Sheereenoo.	Kharek Gotoo.

Prices of dates vary in the ratio of 1 to 4.

The best descriptions come from El Hassa known as Khalás. These are packed in skins of 70 to 120 lbs., and this year may be priced at the average rate of 15 krans per 124 lbs.

The Hellow* from Basreh claims attention next, and is seldom sufficient for the demand; value ranges from 6 to 7 krans per basket of about 140 lbs.

* The next in quality is the Kharekpokhta from Basreh, valued at about 12 krans per 124 lbs.

The Záyedee is about the same price as the Hellow, and is procurable at Basreh.

The Sameeroon from Basreh is very common, and commands between 4 and 5 krans per basket of 140 lbs.

These prices would only stand good for this year, as each year the price is regulated, first by the quantity forthcoming, second by the demand, and thirdly by the craft available for export.

The kran is worth from six to seven annas Indian currency according to rate of exchange.

The date-palm is a source of great help to the poor. They feed on its droppings from May to September, and keep the produce as food for the next seven months, the branches supply them with fuel and material for hutting, the fruit branches, when divested of the fruit, are used as brooms, and the leaf turned into rope* or matting; the stem cut up and used in house building.

* This of a very superior quality.

The date tree is called "Nukhl."

The stem when cut up "Jeddoo."

The branches "Gorz."

The lower part of the branches "Tapool" used as fuel or floats for fishing nets.

The leaf "Peesh."

Toddy is not extracted from the date tree, as the people of these parts have not yet acquired a taste for this liquor. But the experiment has been made, and good toddy can be extracted therefrom at the cost of the fruit.

The seeds received from the Persian Gulf were distributed to several officers and others in Oudh in December 1869, and Dr. Cameron reported on their cultivation thus:—

"The experiment failed in Lucknow and Oonao, and in Gondah it was not attempted, the Deputy Commissioner having transferred the seeds to the neighbouring district, Fyzabad. With these exceptions, the attempt to propagate the date plants from the seeds distributed last year appears to have been remarkably successful." But from a further report received from Oudh, it would appear that 820 seeds were distributed to several individuals in Pertabgurh; of this number, 97 only have germinated, 533† failed, and the rest have not yet been reported on. As regards the other districts of Oudh, the subjoined statement will show the result of the experiment tried in that province:—

† Assuming that the total number of seeds given to others has been sown by them.

Districts.	No. of seeds sown.	No. of seeds that have germinated.	No. of plants now alive.	Condition.
Agri-Horticultural Society, Lucknow	Not known ...	320	300	(Not stated).
Oonao	350*a*	125	125	Good.
Barabanki	Unknown ...	Unknown ...	400	(Not stated).
Fyzabad	Ditto ...	Ditto ...	35	(Ditto).
Gondah	Seeds transferred to Fyzabad.			
Baraitch	Information not received.			
Seetapur	500	400	380	(Ditto).
Kheree	Not known ...	174	174	(Ditto).
Hurdui	Ditto ...	54	54	(Ditto).
Roy Bareilly	Seeds stolen from the Dy. Commr.'s tent.			
Sultanpur	Not known ...	Not known ...	500	(Ditto).

Although application was made for an annual supply of seeds from the Persian Gulf, no further supply has been received since November 1869; and the Chief Commissioner of Oudh has brought‡ the matter to the notice of the Government of Bombay and asked for its co-operation in getting seeds annually for that province.

‡ From Oudh to Bombay, No. 3303, dated 13th July 1871.

(*a*). This number was given to others for cultivation, but it is not clear how many of the seeds were actually sown by them.

GOVERNMENT OF INDIA.

ABSTRACT OF THE PROCEEDINGS OF THE COUNCIL OF THE GOVERNOR GENERAL OF INDIA, ASSEMBLED FOR THE PURPOSE OF MAKING LAWS AND REGULATIONS UNDER THE PROVISIONS OF THE ACT OF PARLIAMENT 24 & 25 VIC., CAP. 67.

The Council met at Simla on Thursday, the 26th October 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding*.
His Honour the Lieutenant Governor of the Panjáb.
The Hon'ble John Strachey.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major General the Hon'ble H. W. Norman, C. B.
The Hon'ble F. R. Cockerell.
The Hon'ble R. E. Egerton.

PANJÁB REGULATIONS' BILL.

The Hon'ble MR. STEPHEN presented the Report of the Select Committee on the Bill for declaring what laws are in force in the Panjáb.

NORTHERN INDIA CANAL AND DRAINAGE BILL.

The Hon'ble Mr. EGERTON moved that the Report of the Select Committee on the Bill to regulate the construction and maintenance of public works for irrigation, navigation and drainage be taken into consideration. He said:—

"This Bill has been for a long time under consideration. The details of it have been very fully discussed in former years. It has again been very carefully examined this year at Simla, and is proposed to be made applicable to the Panjáb only, instead of to the whole of British India. The Panjáb Government submitted in 1867 a draft Bill and rules for the regulation of natural water-supply and water-works, intended for the Panjáb and for the presidency generally. It was found that Act VII of 1845, and the rules drawn up under it, were insufficient to meet the circumstances which had then arisen, owing to the rapid extension of irrigation and the introduction of more regular legal procedure.

"The draft submitted by the Panjáb Government was much amplified by Colonel Strachey. It was re-arranged and some new subjects were added, and a draft Bill, called the Northern India Canal and Drainage Bill, was circulated for opinion in 1868.

"The result of the enquiry then made was, that an amended draft was prepared and introduced in 1869, which it was proposed to make applicable to the whole of Northern India and the Central Provinces.

"From September 1869 to the present time, the Bill has been before the Select Committee. Much difference of opinion regarding some of the provisions of it has been expressed, and the result has been that the progress of the Bill through the Council has been delayed, although it was well known that an amended law was required for the Panjáb four years ago. As it appeared that further delay would result if the Bill remained applicable to the North-Western Provinces, the Panjáb, Oudh and the Central Provinces, and as His Honour the Lieutenant-Governor of the Panjáb agreed generally to the provisions of it and wished to have it enacted without delay, the Committee have made the Bill applicable to the Panjáb only.

"I will now proceed to review briefly the provisions of the Bill under consideration. In the preamble, the right of Government in all lakes, rivers, streams and other natural drainage channels is asserted. This is a right which Native Governments held and exercised; which we have ourselves exercised since annexation, and which it is necessary to assert in order that Government may be able to use the natural water-supply for the public benefit in the best manner.

"If a law of this kind is enacted without some express declaration of the rights of Government, there is danger, I think, that, hereafter, it may be held that Government has waived the rights which it did not assert. The laws relating to irrigation in those countries of Europe where irrigation is controlled by the State, declare the rights of Government in sources of water-supply, and there is good reason for our following the same course here, where the Government holds a similar position.

"Part II of the Bill provides the manner of applying a water-supply for public purposes, and for compensating persons who suffer loss.

"The principle is fully described in section eight. The matters for which compensation may be given and those which are excluded, are defined. Compensation is given where works which have been constructed for utilizing the water-supply are rendered less useful, or are permanently stopped, by the action of Government, but not for natural advantages arising from proximity. Section number eight provides a clear rule for calculating the amount of compensation where the market-value cannot be ascertained, and it bars the acquisition of new rights to compensation, except by grant or prescription.

"This part of the Bill is of great importance. There are many new canals, either under construction or projected, in the Panjáb. Unless the principles on which the rights which may be affected by the construction of new canals are defined, it is impossible to make an estimate of the financial results of making them.

"The Deputy Commissioner will make the awards of compensation under this chapter by a procedure similar to that prescribed in the Land Acquisition Act, 1870.

"Part III of the Bill provides, in sections fourteen to thirty, powers in regard to making surveys; entering upon lands in case of accidents; constructing and maintaining works of public convenience connected with canals; and constructing and maintaining water-courses and obtaining land for this purpose. These matters are necessary, and the provisions of the Bill in regard to them are appropriate. Section twenty-eight provides that, when land is taken up for a private water-course, compensation may be given, in the form of a rent-charge, or it may be taken up permanently, at the option of the person to be compensated.

"Sections thirty-one to thirty-three contain the terms on which water is to be supplied from a canal by Government. The Bill states the conditions which must be included in all rules or contracts made by the Local Government.

"Power is given to the canal officer to stop the admission of water into a water-course for the purpose of executing any work, and when the water-course is not kept in proper repair.

"Claims for damages caused by stoppage of water, beyond claims for remission of the water-rate, are barred as against Government in certain cases specified in clause (*b*).

"In other cases, compensation may be awarded, clause (*c*).

"In clause (*d*), claims for continuance of supply are barred.

"In clause (*e*), the conditions of sub-letting and transfer are stated.

"In clause (*f*), Government is protected against the growth of prescriptive rights to a supply of water.

"These conditions have been framed with a view to enable Government to make the best use possible of the water of a canal. It is necessary that Gov-

ernment should have full power to distribute the water of a canal in the manner which will be most beneficial to the persons who can use it, and for this purpose the Government must be protected against claims, or the growth of prescriptive rights, which will impede its action.

"Sections thirty-three to thirty-five declare the liability to charges for unauthorized use or waste of canal water, and provide for due realization of rates on lands held jointly.

"In sections thirty-six to forty-three, the water-rates on irrigated lands are defined.

"They are two:

1, the *occupier's rate*, which is paid by the cultivator for the use of canal water, and which is part of the immediate cost of cultivating the land;

2, the *owner's rate*, which represents the enhanced value of the share of the produce to which Government is entitled as land-revenue, but which, in the case of land irrigated from a Government canal, as it is entirely due to the water, should be considered a water-rate.

"The *occupier's rate* is the ordinary canal water-rate which has always been levied.

"The *owner's rate* is a new one.

"It has for some years past been levied in the Panjáb on the Bárí Doáb Canal, and is there called water advantage rate. It is fixed by the settlement officer in communication with the canal officer, and is levied from lands actually irrigated, along with the usual water-rate.

"It originated in the Panjáb from a proposal of the Settlement Commissioner, Mr. E. Prinsep, and his letter detailing the manner of imposing it will be found at page 167 of the volume of papers on this Bill.

"The advantage of the water advantage rate, or owner's rate, is that, instead of an assessment at canal irrigation rates being fixed for certain lands under irrigation at settlement, and kept on those lands during the whole term of settlement, whether they are irrigated or not, the rate is levied at each crop on the land actually irrigated for that crop; so that, not only does the assessment fall on the land which should pay it, but, if any increase or decrease in irrigation takes place, the Government either receives enhanced revenue or the people receive a fair reduction in the demand.

"Sections thirty-nine to forty-one declare who shall be liable for the owner's rate in certain cases.

"No owner's rate will be imposed on lands assessed to land-revenue at canal irrigation rates, until a reduction has been made in the land-revenue demand equivalent to the enhanced rate; during the currency of a settlement, the whole sum demandable as owner's rate is not to exceed the sum so reduced, and the owner's rate is limited to one-half the increase in the nett annual value of the land produced by canal irrigation. The provisions regarding the owner's rate are in accordance with what already exists in the province, and provide for the assessment of the revenue in future on a just principle.

"Sections forty-four to forty-nine—'Irrigable, but not Irrigated.' These sections form part of the Bill introduced in 1869; but they now stand very much modified. The conditions under which a special rate may be applied are so strict, and the power conferred on the Local Government is so large, that I think it very difficult to make the provisions applicable to any canal. In the Panjáb, where the demand for water is very great, there will never, I think, be occasion to apply those sections to any canal.

"Section fifty—'Percolation.' This section enacts, in a modified form, rules made under Act VII of 1865, but makes the power to levy a water-rate conditional on the advantages received.

"Sections fifty-one to fifty-three provide for the collection of canal dues in the same manner as land-revenue.

"Part IV of the Bill relates to navigation.

"There is at present no water carriage on any of the Panjáb canals. On one of them, the Bárí Doáb Canal, it is intended to provide locks, and the works have been constructed with a view to making the canal navigable hereafter. Provision has been made for making rules to regulate navigation, and for collecting the Government dues on vessels which ply on the canal and on goods conveyed in vessels or stored in Government premises during transit.

"Part V of the Bill relates to drainage.

"It gives powers to canal officers to remove obstructions to drainage, and to the Local Government to order new drainage projects to be undertaken and carried out, and gives power to levy a rate on lands benefited by such works to defray the cost of such drainage work under certain conditions.

"The provisions of this chapter are very necessary.

"The drainage of lands adjacent to the Western Jumna Canal is very defective, and the health of the inhabitants of large tracts of country in the Karnál and Delhi Districts is injured, and the productive power of the land diminished, by obstructions which it is difficult under the existing law to remove.

"On some of the Panjáb rivers, especially on the Indus, it is necessary to construct protective works to guard the heads of the inundation canals and to protect the lands exposed to inundation.

"The provisions of this chapter will apply to works constructed for the above-named purposes.

"Part VI relates to the mode of obtaining labour, when ordinary labour is not procurable, for the purpose of repairing canals in case of accident or apprehended danger, and for effecting the clearances necessary for the proper flow of water in canals. The provisions of this chapter may seem arbitrary to those who are not acquainted fully with the circumstances of the canals of the Panjáb and with the customs of the people who use them for irrigation.

"Where ordinary labour is procurable, no canal officer would ever employ labour of any other kind. The trouble of managing impressed labourers is great, and the work they perform is generally less than that done by ordinary labourers.

"The power which this chapter of the Bill confers will be exercised, in the portions of the country which are thickly populated, only in case of sudden emergency arising; for there, labour is procurable without difficulty for all ordinary purposes. But in the parts of the country which are sparsely peopled, and where inundation canals are used, it is necessary to call out the people to effect the ordinary silt clearances, to make new heads to the canals, and to perform such other emergent work as is required to keep these canals in working order. Silt clearance is a work which must be done in a limited time. It requires, therefore, the employment of a large number of labourers for a short period; conditions which are most unfavourable to the execution of such work in thinly populated tracts.

"We found this system at work when we annexed the Panjáb, and we have rules which have the force of law under the Indian Councils' Act to carry out the system. The cultivation of a large tract of country depends on the maintenance of these canals, and the people themselves assent to the necessity of procuring labour in this manner. There is nothing, therefore, really harsh or arbitrary in this chapter when the conditions of the country and the importance of irrigation are considered.

"The Canal Report for 1868-69 shows that 574,297 labourers were present for silt clearance on the Satlej and Chináb Inundation Canals in the Multán and Montgomery Districts. The value of the labour of these men was rupees 2,15,460,

and the fines levied for non-attendance amounted to rupees 42,000. The canals on which this labour was expended irrigated about 200,000 acres of land, in a part of the country where the rain-fall is about three inches per annum, and where the population is not more than eighty-one per square mile. In the district of Muzaffargarh, where the canals are not under Government management, a similar system of statute labour for canal clearances is carried out by the people themselves under the control of the Deputy Commissioner, without the least difficulty or complaint. The object of the provisions of chapter VI is to confer such power as may enable Government to enforce the system which the people themselves have found it necessary to adopt, and which is at present the only practicable one for maintaining irrigation in some parts of the country.

"Chapter VII of the Bill provides for jurisdiction in certain cases.

"Section seventy-three makes the order of the canal officer final in disputes regarding distribution of water for the time when any crop is in the ground. The disputants may try their suit in the Civil Court in order to determine their rights for the future; but it is better to give the power of deciding such cases summarily to the officer who has the control of the canal, and who can give immediate effect to his orders, than to refer the parties to a Court whose decision must be less speedy, and which cannot give direct and immediate effect to its own decree.

"Part VIII of the Bill relates to offences and penalties, and confers powers on the Local Government to frame rules for carrying out the provisions of the Act. These do not call for any special remark. I may mention that I have received from Colonel Crofton—the Chief Engineer of Irrigation Works in the Panjáb, who drafted the first Bill which was sent up by the Panjáb Government, and who is one of the most distinguished officers of the Irrigation Department in India—an expression of his approval of the Bill as it now stands. The opinion of an officer of such wide experience and of such impartial judgment gives me good reason to hope that the Bill will meet the requirements of the country, and I trust it may be passed."

The Hon'ble Mr. COCKERELL moved, as an amendment, that the Bill be recommitted to the Select Committee with instructions to report again thereon in two months. He said:—"I have been compelled to dissent altogether from the conclusions arrived at by my colleagues on the Committee by which this Bill has been considered, because, in my humble opinion, the course which has been adopted in regard to it is extremely unsatisfactory.

"The Bill was introduced into the Council in February 1870, and was then intended to apply to the whole of Northern India, including Oudh and the Central Provinces. At the time of its introduction, some of the more important provisions received marked attention, and the principles on which they were based were assailed by certain members then present. For various reasons, to which it is unnecessary to refer particularly further than to say that the delay was in no respect due to any opposition on the part of any members of the Select Committee as then constituted, no progress was made in the consideration of the Bill until the Council resumed its sittings at Calcutta towards the close of last year.

"At that time the opportunity for a discriminate consideration of the somewhat intricate and novel details of the Bill, and the elaboration of a sound enactment on this subject, was peculiarly favourable, for the Select Committee had been greatly strengthened by the addition of two new members—the Hon'ble Messrs. Inglis and Robinson—who possessed a thorough acquaintance with the practical working of irrigation and the administration of the canal departments in the Panjáb, the North-Western Provinces and the Madras Presidency.

"Early in the present year, the Select Committee commenced its labours, and I know of no reason for their not resulting in the presentation to the

Council, and eventual passing into law, of a well-considered measure applicable to the whole of Northern India, ere the sittings of the Council in Calcutta were brought to a close, had the conduct of the Bill through Committee been judiciously persevered in by the hon'ble member in charge of it.

"In fact, with the exception of the clauses relating to the imposition and recovery of rates, all the essential provisions of the Bill may be said to have been determined before the meetings of the Committee were suddenly suspended, and the hon'ble member in charge of the measure recorded his opinion, in a minute which I subsequently heard of but have never seen up to the present time, to the effect that it was expedient to abandon the proposed legislation so far as it applied to the North-Western Provinces, and confine it exclusively to the Panjáb.

"I confess that, having regard to the past history of this measure, which I have just recounted, I felt some surprize when I heard that it was proposed to proceed with the Bill at this place, from which so many of the members who had taken an active part in the discussion of the subject and the settlement of the most important clauses of the Bill during its progress in Committee at Calcutta, were necessarily absent. But my hon'ble friend (Mr. Strachey), in introducing the subject here, by moving that His Honour the Lieutenant-Governor of the Panjáb and the Hon'ble Mr. Egerton should be added to the Committee, although he made some reference to Colonel Strachey's recorded opinion to which I adverted just now, and expressed his previous concurrence therein, remarked that—'a letter had been addressed to the Government of India by that of the North-Western Provinces, in which it was stated that His Honour the Lieutenant-Governor observed with much regret that the Bill for regulating irrigation in Upper India had not yet passed into law; that serious loss and inconvenience arose from the delay; and that the passing of the Bill with all possible expedition was earnestly recommended.'

"The letter went on to say 'that, till the Bill was passed, the Government had no legal control over beds of rivers, and could not interfere with private dams, however desirable, on public grounds, such interference might be; and, moreover, that considerable loss of income had resulted from the present defective condition of the law.' From these remarks it was to be assumed that the measure was to be proceeded with in its full integrity and according to its original design; that the consideration of details was to be taken up from the point at which it had been suspended in Calcutta; and that the conclusions already arrived at by the larger Committee at that place were to be maintained. I have gone thus minutely into the history of the progress of that Bill up to the period at which my hon'ble friend (Mr. Egerton) assumed charge of it, as pertinent to the question which I have now to ask, namely, why the local extent of a measure originally designed for application to the whole of Northern India and especially needed, as has been shown, in the North-Western Provinces, has been cut down to the limited area of the Panjáb?

"The report of the majority of the Select Committee states that the 'change has been made on account of the difficulty of adapting the provisions of the Bill to the circumstances of the whole of the territory to which it was first proposed to extend it, in such a way as to keep what was suitable for each province.'

"I demur to the precise correctness of that statement; it implies that there are matters of detail connected with this Bill which, owing to the varied circumstances of the different provinces to which the measure as originally designed was intended to apply, cannot be regulated by any uniform set of provisions. But the only provisions to which the authorities of the North-Western Provinces object rest upon questions of principle which, if they are to be affirmed in the sense contemplated by the Bill, may as equitably be so affirmed in respect of one portion of the empire as another.

"Almost the whole of the provisions of the Bill which are of practical importance in the working of a general scheme of canal irrigation—I refer to the subjects comprised in Parts II, IV, V, VII and VIII, and so much of Part III as relates to the powers of canal officers, the construction and maintenance of works, the conditions of a water-supply and the charges therefor—are not only accepted, but urgently asked for, by the Government of the North-Western Provinces; and we are told that a considerable loss of income has already resulted from the want of such legal power as is provided by the clauses to which I have referred. I ask those who are responsible for the economical administration of the financial affairs of this country, whether this state of things is to be permitted to continue, and the Government of the North-Western Provinces is to be told—as seems to be the practical effect of the course which is being taken in regard to this Bill—that, until it assents to the principle of a compulsory rate, it is to be excluded from the benefits of special legislation in regard to canal-administration. If that is the intention, such a course will, I venture to think, scarcely redound to the credit of this Council or of the Supreme Government in public estimation. If, on the other hand, it is proposed to bring forward and enact shortly a similar measure for the North-Western Provinces, then I must say that such procedure will be wholly inconsistent with the policy of all our recent legislation which has been undertaken for the purpose of welding together and consolidating as much as possible the existing law.

"The preamble to the amended Bill is in my opinion objectionable, inasmuch as it asserts a somewhat doubtful statement of facts; that a certain sovereign right in all natural streams and water-courses vests in the Government, pretty much in the same way as it does in regard to land, unless it has been specifically relinquished, no one can doubt; but there is also a co-existent right of usage of the water of natural streams vested in the community, and this seems to be distinctly recognized by the provisions of section eight. The declaration of the preamble, which implies that the State enjoys an exclusive right of property in the water of natural streams and channels, and the contents of clause eight, involve an apparent contradiction, and I think it would have been better if the former had been omitted.

"In the assessment of the owner's rate in the manner proposed, there is, I think, some hardship. Where the land-revenue has been already assessed at canal irrigated rates, it is provided that a refund of the extra revenue assessed in consequence of such irrigation is to be allowed before the owner's rate can be exacted; but no allowance is made for those cases in which the land has been assessed at wet rates by reason of irrigation from wells or sources other than canals constructed and maintained by the Government.

"Of the practical bearing of this question on the operation of this Bill, as now limited, I am unable to judge, as I am unacquainted with the facts of the case as regards the extent of well-irrigation in the Panjáb. I know that it is largely carried on in the North-Western Provinces. My contention, however, would apply, more or less, in any case, for it is one of principle. I hold that, to whatever extent the advantages of irrigation from any source have been already taken into account in the assessment of land-revenue, to such extent a proportionate allowance must in equity be made in the adjustment of the owner's rate.

"I think also that it is unwise to disturb existing settlements in the manner contemplated by the Bill, where the land-revenue has been assessed at canal irrigated rates, except in the way of extra charge for an extension of the irrigated area. I know that it is proposed to take, in the form of 'owner's rate', no greater amount than has been previously deducted from the land-revenue assessment, and that thus, practically, the landholder in such case will be subjected to no greater charge than at present; but I hold strongly that sound policy requires a foreign government to abide, not only by the spirit, but by the letter of its engagements with its subjects, so as to avoid all reasonable grounds of suspicion and distrust which any other course is sure to excite in the minds of the people. I fully recognize the importance—I may say the absolute necessity—of maintaining a complete separation of these two items of revenue—land assessment and water-rates. I have read very able papers on this subject, and I think the arguments used in them would carry conviction to most minds as to the cogency of the reasons for dealing separately with things involving such essentially different conditions and considerations as the assessment of a water-rate and the settlement of land-revenue. But great as is the expediency of adopting this course, I would restrict it to future operations, and I deprecate the disturbance of settlements which have been already made where canal irrigation was available and fully taken into account at the making of such settlements, as likely to suggest doubts of our good faith in our dealings with the people of this country.

"The most important feature of the Bill is the provision contained in section forty-four for the levy of a rate on lands irrigable, but not irrigated; and I would first draw attention to the rather curious position in the Bill which this provision occupies. Like the proverbial snake in the grass, it is almost hidden in the ramifications of Part III, which, though the receptacle of all sorts of unconnected matters, bears simply the unsuspicious heading—'Special powers of canal officers in relation to surveys, construction and maintenance of works and decision of differences regarding water-courses.' The principle of such an assessment was, on its first appearance in the original draft, strongly attacked, and especially reprobated in a dispatch from the Secretary of State, dated 11th January 1870, from which I need make no quotation, as it has been published and circulated as a paper on the Bill. But it will be said that this provision has been divested of its obnoxious character by the conditions which have been attached to the levy of a compulsory rate, and which are included in the amended Bill. To show that this is not the view taken by those who are amongst the most competent to form a sound conclusion on this point, I will read from a letter from the Government of the North-Western Provinces in regard to the amended Bill. The Lieutenant-Governor, who, it will be remembered, was the strongest opponent to the principle of a compulsory rate when the idea of levying such a rate was first started, is of opinion that the provision of the amended Bill on this subject is 'even more objectionable than as it stood in the original Bill. There, the imposition of the rate was made to depend on a distinct financial necessity, and the measure itself could not be introduced unless it were proved that the canal had failed to reach a specified percentage of profit. The character of the imposition was thus marked, and its range defined and limited. In the present Bill, neither cause nor limit is assigned. The measure will simply be based on the opinion that reasonable use has not been made by the people of the canal; and, on this opinion, an agriculturist, who never took a drop of water from the canal, or intends to take it, who finds, in fact, that it is not for his interest to bring water channels to his fields, can be charged a special rate which may reach to two rupees an acre. The injustice of such a proceeding seems to be patent on the mere statement of it.'

"There was something peculiarly offensive to the popular notion of that 'equity and good conscience' which does duty for substantive law to so large an extent in this country, in making the non-realization of a seven per cent. return on an outlay of capital borrowed at four per cent., the main condition of the levy of this impost; but it may well be questioned whether, as the Lieutenant-Governor surmises, the new condition as to the 'reasonable use' may not press more hardly upon the landholder than the former one. In any case, by whatever conditions the action to be taken upon it may be surrounded, the principle remains unaltered, and, consequently, the objections to that principle must apply as strongly in the case of the present Bill as its predecessor. It has been asserted that the principle of the proposed tax differs in no respect from that which governs the levy of special taxation in towns

for various descriptions of municipal improvements. I contend that there is no analogy whatever between these cases. In the latter, theoretically at least, the taxation is imposed by the will, or with the consent, of the representatives of the tax-payers. I say theoretically, because literally Municipal Commissioners are not the delegates of the people, yet, generally speaking, the Government makes such selections for those offices as the people, if they were vested with the power of election and were likely to make a discreet and discriminate use of it, would themselves choose. Taxation so imposed is surely something very different from the measure provided by this Bill.

"Again, in the case of municipal taxation, the tax-payers get something for their money, which, however much or little they may appreciate its value, does undoubtedly enure to them very substantial benefits; but the landholder subjected to the special rate gets no benefit in return. It will be said that the conditions under which only the rate can be levied require that the use of canal-irrigation should secure greater profit to the agriculturist than he would otherwise have obtained It is just because cases may occur, in which it may be shown that the cultivator would have secured a better crop from the use of canal-irrigation than he would have done without it, and because such cases are extremely likely to occur and will subject the landholder to the screw of the special rate, that I regard the provisions of this Bill with so much apprehension. For it may well be that the cultivator intelligently and wisely elects not to use canal-irrigation, to forego the estimated increase of profits, in order to avoid what he may conceive to be the more than counterbalancing concomitant evils attending the use of such irrigation. He may say 'I know that I should get a much larger profit from the use of your water, but either from well-irrigation or the natural resources of the soil unaided by your water, I get a return sufficient for my wants, and I would rather forego possible increased profits than bring myself within the dominion of the canal officers. By resorting to the use of canal-irrigation, I incur all sorts of responsibilities and obligations in regard to water-courses and the like, or I must give up my wells and depend entirely upon you for a water-supply, and you may, as you have carefully freed yourselves from all pecuniary responsibility for the non-fulfilment of my just expectations, disappoint me just at the moment of my utmost need.'

"I do not, by the case which I have put, intend to suggest that the canal officers are, as a rule, in any degree less mindful of their duties to the people with whom they are brought in contact than any other body of public officers would be under similar circumstances; but I do wish to point out that the proposed law practically invests those officers—and I believe necessarily so—with very extensive authority, and that, keeping this fact in view, it must be regarded as not the least mischievous consequence of the power of levying a compulsory rate, that the inducement to use their authority wisely so as to attract a voluntary recourse to canal-irrigation by a popular administration of the system, is, through the existence of that power, to a great extent withdrawn.

"Another important argument in favour of the levy of this special rate is that, on grounds of humanity, no less than on sound financial considerations, irrigation must be promoted by the construction and maintenance of canals for which somebody must pay; and that this being so, it is more just to assign the burden of the cost of these works to those for whose benefit they are devised than to impose it on the general tax-payer.

"The first proposition may be readily admitted, subject to the reservation that no injustice or hardship is caused to individuals as the necessary consequence of these works. When that limit is overstepped, I should hold that it is not desirable to construct canals. But, in regard to the apportionment of the burden of cost, I contend that the argument is wholly unsound. Of course, every projected work of this sort is intended to benefit some people; but if, through any error of design or construction—and the history of some of the more recently constructed barracks shows that even officers of the Department

of Public Works, upon which the design and execution of canals must devolve, are fallible—the work failed to achieve the general object of its design, surely it would not be just to saddle certain persons with the cost, who have derived no advantage from the work, and have had no option whatever in the matter of its construction, merely because it *was designed* for their benefit.

"Take, as a possible illustration of such a case, the Sarda and Rohilkhund canals, which are, I believe, either being constructed or are about to be constructed. One of our hon'ble colleagues (Mr. Inglis) who has a thorough practical acquaintance with Rohilkhund, is of opinion that, owing to the water being so near the surface, and the consequent facilities for kacha well-irrigation which exist in the country to be traversed by these canals, the mass of the agriculturists will not take the water, and that, consequently, the canals cannot prove a profitable undertaking.

"The truth is, that canals are projected and constructed mainly in the interest of the general tax-payer to lighten his burdens, directly, by staving off the heavy cost of periodical famines, and indirectly by improving the general resources and wealth of the country. Where these works are wisely designed and carried out, they are sure to answer their purpose without the aid of section forty-four; the risk of error in design or construction should in all equity and reason be borne by the general tax-paying community, whose agent the Department of Public Works is in projecting and carrying out these schemes. That community is, on every consideration, as justly chargeable for the consequences of an unwise or unskilfully executed canal project as for the cost of barracks which through faulty construction may have fallen down or become otherwise unserviceable.

"Lastly, in connection with this subject, I wish to draw attention to the provision of the final paragraph of section forty-eight. It runs as follows: 'If any question shall arise whether the said conditions are complied with or not in respect of any land, it shall be determined in the same manner as suits relating to rent under the law for the time being in force.' In the first place, I do not understand the object of this special reference to rent suits in a Bill the operation of which is limited to the Panjáb, where such suits, I believe, take the same course, both as to the class of Court in which they are instituted and the form of procedure under which they are tried as any other actions for debt; but my main objection to this clause is in regard to the vague form which it prescribes for the treatment of a very important matter. It cannot be doubted that, wherever the attempt is made to levy this rate, 'a question' will arise; and I say that, if the application of these conditions is to be anything more than a sham and a delusion, it should be distinctly provided that, ere the rate can be levied, the 'question' must be tried in the form of a suit in which the Government is the plaintiff and the objecting landholder the defendant, so that the matter may be determined in an impartial manner, and the person resisting the imposition of the rate may have such advantage as the position of defendant, and the consequent *onus probandi* on the other party, the Government, are calculated to afford.

"The provisions of Part VI, in regard to forced labour, go much further than the conclusion arrived at on this question by the Committee, by which it was much discussed in Calcutta. The procedure of the Bill in this respect is defended on the ground that, in some districts of the Panjáb, owing to the sparseness of the population, the amount of available labour is very small, and that, moreover, the system of employing 'chers,' who appear to be a species of serfs, with or without their consent, on canal-works is distinctly recognised and allowed by the existing law of the Panjáb.

"From Mr. Barkley's book on the law of that province, which has on other occasions been assumed to contain all orders and rules having the force of law, it would appear that this impressment of labour is authorized only on the Indus Canals, in the Dera Gházi Khán District, and on the Multán inundation canals, for ordinary works, such as silt clearances, and this, moreover, for

stated periods, *i. e.*, from the beginning of January in each year to the middle of April. In other parts of the Panjáb, as, for example, on the Upper Sutlej Canals, the resort to forced labour is restricted to emergent occasions, where serious injury is apprehended and the supply of labour available for hire is inadequate.

"This is in accordance with the conclusion of the Calcutta Committee as to the circumstances under which only the impressment of labour should be authorized, and represents, in my opinion, the extreme limit to which the extension of forced labour can be justified.

"The mere fact that in certain places the ordinary supply of labour available for hire is insufficient for the purpose, does not justify the strong measure of impressment for an occasion which can be long foreseen and, consequently, otherwise provided for.

"There are many parts of India in which the local supply of labour is insufficient for the requirements of such places, and hired labour has to be brought from a distance. That the importation of labour enhances greatly the cost of the work to be executed is no sufficient reason for the retention of the system of forced labour, even though that system may heretofore have been in some degree sanctioned by rules having the force of law.

"The Bill, as amended, in point of fact, provides for a considerable extension of the existing law, inasmuch as it is proposed to give to the local Government the power of sanctioning the use of forced labour for ordinary canal-works in any part of the province. It further includes, under the denomination of 'labour' liable to impressment, all persons exercising any handicraft, and makes the neglect on the part of any such labourers to comply with the requisition for their labour a criminal offence punishable with one month's imprisonment.

"Under the existing system, 'chers' have the option of avoiding the obligation to supply their labour by the payment of a daily fine of four annas in lieu thereof.

"I am very strongly of opinion that the tendency of new legislation in this era of advanced civilization should have been rather to relax the harshness of the existing system than to render it more stringent and far-reaching, as is now proposed, and I think the power conferred by the Bill on the Local Government in this matter open to grave objection.

"My Lord, I have thus stated the reasons, very imperfectly I feel, which, in my opinion, render this Bill unfit for enactment in its present shape. I hold that, whatever may be the practical inconvenience—and it cannot be very great—which would result from the adoption of the amendment which I am now about to move, it weighs as nothing in the balance against the cogent reasons which exist for extending the essential provisions of the Bill to the North-Western Provinces, and the propriety of determining such questions as are involved in it in a Council constituted, as I pointed out when I last spoke on this subject, as it can only be constituted when it assembles in Calcutta. With these remarks, I move that this Bill be re-committed, with instructions to the Committee to report again thereon in two months."

MAJOR GENERAL the Hon'ble H. W. NORMAN, although he had strong objections to one part of the Bill, was not prepared to support the amendment of his hon'ble friend Mr. Cockerell. The Bill was declared to be applicable only to the Panjáb, and he (MAJOR GENERAL NORMAN) was not aware of any peculiar circumstances in connection with that province which would render the clauses referred to less objectionable there than elsewhere. It appeared to him, therefore, that the Bill might with propriety be proceeded with, sitting as the Council was in the Panjáb, with His Honour the Lieutenant-Governor and the Hon'ble Mr. Egerton present to share in the responsibility of passing it. MAJOR GENERAL NORMAN thought this better than that the consideration of the Bill should be deferred until these gentlemen were absent, even though the Council might then be joined by gentlemen who,

whatever their other merits, could not be supposed to possess much authority as judges of what is applicable to the Panjáb.

The Hon'ble MR. ELLIS did not intend to say much in regard to the point raised in the amendment of his hon'ble friend, Mr. Cockerell, as those who were in charge of the Bill would be best able to answer for the procedure which had been adopted. He (MR. ELLIS) however advocated the pressing on to completion of the measure while the Council had the advantage of the presence of His Honour the Lieutenant-Governor and the Financial Commissioner of the province. He did not think it necessary to slay the slain over again and follow his hon'ble friend, Mr. Cockerell, through the details he had entered into regarding the original provisions of the Bill, for these provisions were no part of the present measure; but he agreed with his hon'ble friend in his expression of satisfaction that their further prosecution had been vetoed by the order of the Secretary of State. These provisions, however, were not now under discussion, and any objections that might have been taken to them, as they originally stood, were quite irrelevant, as the Bill, as now framed, was of a different character. The present Bill appeared to MR. ELLIS to be a compromise between the extreme views of those who held that, if a canal was to be made, the district through which it passed must also be made to guarantee the work paying at any price, and the views of those who held that under no circumstances should a person be called upon to pay for water which he was not disposed to use. He took this to be a compromise, and he accepted it as a fair and reasonable one. If anything was to be said against the principle adopted, it would be that it was fenced round by conditions so varied, complicated and difficult of proof, that there were too many safe-guards, rather than too few, against oppression and injustice to the people. He did not conceive, however, that it would be necessary to put these clauses in force in the Panjáb; for, from all he could ascertain, the people of that province were only too glad to get water wherever they could; the only doubt being that, in some parts, there would not be a population sufficient to make use of the water available. This being the case, the provisions of the Bill would be harsh! and it would be asked "Why enact them at all?" The answer would be that, in carrying out large schemes of this nature, involving considerable sums of money, the Government naturally looked to the financial success of the schemes, and required a guarantee that that financial success should be ensured. He was thoroughly agreed with the hon'ble member who moved the amendment, that they should not attempt to secure themselves against engineering failure by a tax upon the people for whose benefit these engineering failures were designed; but the Bill, as at present drawn, did nothing of this kind. It did not charge the people with the expense of engineering failures; if it did, then he would certainly not support the clauses. It was obvious that, so far as engineers were concerned, the success of works of this kind would depend upon two calculations—the calculation of the cost of the works, and the calculation of the area irrigable. The rates were fixed by revenue officers, and, for them, the engineers were not responsible. If the work failed because it cost more than was originally estimated, or because it was found that the supply of water was not sufficient, or that the area irrigable was not so large as was expected, then there would be an engineering failure; but in such cases, according to this Bill, no one would be liable for a single pice more than he already paid; and, this being so, MR. ELLIS could not conceive how his hon'ble friend imagined that the Bill under discussion was designed to cover engineering failures, or to foist the cost of such failures upon the people in any way. If, however, from ignorance, wilfulness, or other similar cause, the people refused to avail themselves of the water made available to them for their profit, then he (MR. ELLIS) would say there was no hardship that these people should pay to ensure the financial success of what was carried out for their benefit; and if such success were not assured within reasonable limits, no irrigation works could be undertaken,

There was an analogy between this and the case of land-revenue. Assessment was fixed on the best lands at a high rate, on the supposition that the best kind of crops would be grown thereon ; but, if the landholder refused to grow the best kind of crops and grew only inferior crops, he was not the less obliged to pay a high assessment. The land was made more valuable, and, if the owner retained possession of it and had increased facilities, whether he wished to make use of them or not, there was no hardship in making him pay a higher rate for land which he retained and allowed no others to use to their advantage. MR. ELLIS therefore had no sympathy with those who raised a cry of oppression and injustice in the case of the taxation imposable under very stringent restrictions by the clauses of the Bill as at present framed.

The Hon'ble MR. STEPHEN did not propose to address the Council at any length upon the measure, because he felt that its provisions related to subjects upon which his opinion could be of little or no value; but there were some observations which had fallen from the Hon'ble Mr. Cockerell upon which he should like to say a few words. These remarks would relate to the procedure which had been adopted with regard to the passing of the Bill ; to the suggestion that it should be brought up in Calcutta, instead of being passed here, and to one or two observations which the Hon'ble member had made in connection with certain provisions which it contained. First, with regard to the passing of the Bill : in addition to the arguments put forward by Major General Norman and the Hon'ble Mr. Ellis, he (MR. STEPHEN) thought there was one consideration which had been overlooked. The Bill as originally drawn up was applicable to Northern India, that is to say, Oudh, the North-West and Central Provinces. The Legislative Council stood, with regard to Northern India, in the position of a local Council. It seemed, therefore, to MR. STEPHEN that, sitting as they were in one of the most important provinces of Northern India, they were very properly employed in discussing a Bill which referred to it, and he would remind the Council of the fact that, only a fortnight ago, they passed in that place another Bill for Northern India, without any suggestion being made that it was improper to do so. What conceivable objection could therefore arise as to the passing of the Bill at once ? After considering the matter carefully, and without the smallest desire to say anything personally offensive, MR. STEPHEN was of opinion that the only difference between the passing of the measure at Simla and at Calcutta was, that, in the one instance, they would have the pleasure and advantage of Mr. Inglis' presence in the Council, and, in the other, that of the Lieutenant-Governor of the Panjáb and the Financial Commissioner: other Members would no doubt be present at Calcutta, but they would be in no way specially connected with the Panjáb or with the North-Western Provinces. His hon'ble friend, Mr. Cockerell, mentioned the name of a gentleman for whom he (MR. STEPHEN) had the greatest respect—Mr. Robinson—who was a Member of Council, and also of the committee which had taken part in the consideration of the Bill at Calcutta. Mr. Robinson's experience, however, lay entirely in Madras, and from what he (MR. STEPHEN) could gather from the discussions which took place in the spring on this subject, the state of affairs in that Presidency, in relation to irrigation, differed from that which existed in Northern India.

His hon'ble friend also asked, why did we not include the North-Western Provinces in this Bill? The answer to that was, that the North-Western Provinces were not included simply out of deference to the wishes of the Lieutenant-Governor of those provinces. The case stood thus: The Bill, as originally introduced, was intended to include these as well as Oudh and the Central Provinces. There was no difference of opinion between the Hon'ble Member in charge of the Bill and the Local Government of the Panjáb; but there was a difference of opinion between the Hon'ble Member in charge of the Bill and the North-Western Provinces. They proposed at present to pass the Bill for the Panjáb, but that did not debar the Government of India

from arranging in Council with the local authorities for an extension of the measure to the North-Western Provinces, with any adaptation of its provisions that might be considered suitable for their wants.

MR. STEPHEN would have preferred, from the juridical point of view, if a single Bill could have been drawn and arranged for the whole of Northern India. But the point was not one of any real importance; and it appeared to him that the only inconvenience which could arise from the course now proposed to be taken with reference to this Bill, was that of having the subject dealt with by two Bills instead of one.

It was asked why the Bill was not passed at Calcutta in the spring ? MR. STEPHEN was surprised that any one who was a member of the Committee on that Bill should put such a question, and not himself supply the answer. It was not passed because it could not be. There were present in the Council four members of that Committee, and speaking as one of them, and in the presence of the other three, he would appeal to each of them, and to his Hon'ble friend, Mr. Cockerell himself, as to the amount of progress which was made by that Committee. The discussion disclosed so many differences of opinion, and so many objections were raised on the various points submitted for consideration, that it was practically impossible to get through the Bill before the Council left Calcutta. If the amendment of his Hon'ble friend were adopted, and they were to go back to Calcutta, and have the old Committee reassembled, the result would be that the business of the Legislative Department, already extremely heavy, would be greatly hampered, and much public time and labour would be wasted.

MR. STEPHEN would now say a few words with regard to those principles of the measure to which his hon'ble friend had referred. The Hon'ble Member told them that the report stated that, when the Bill was introduced into the Panjáb, there was some difficulty in adapting its provisions to the whole country. The warm discussions in Committee between Hon'ble Members from different provinces proved the correctness of this.

With regard to the omission of the clauses relating to the rates, MR. STEPHEN did not like to pass the matter over in silence ; but, on the other hand, he believed that his opinion on the point would be of little value.

There was force in the remark that the people of the district were not consulted and did not consent to the expenditure which was thrown upon them, and it might be true that the temptation to extravagance was not removed by the fact that a rate would have to be imposed upon irrigable land.

This point, however, was subject to an observation which afforded a complete answer to it, namely, that it was one of the inconveniences of the situation in which they were placed in this country that they were not able to consult the people upon matters of that kind half so much as they would wish to do, and that they were practically obliged to act for them, undertake the management of their affairs, and do the best they could with an honest regard for their interests.

There was one other observation of the Hon'ble Mr. Cockerell which he (MR. STEPHEN) wished to notice.

His hon'ble friend had objected to the preamble to the Bill, which stated that all rivers and other collections of water in the Panjáb were the property of the Government, and that, he said, was inconsistent with the provisions of section 8 of the Bill. MR. STEPHEN did not think this was correct, as it seemed to him that section 8 qualified the recital, and that recital referred to a law which was observed by every rational country in the world, namely, that great natural resources were not to be the property of individuals, but were to remain the property of the nation at large. When they were spoken of as the property of the Government, it was not to be understood that the Government were the owners as against the people : what it meant

was, that the public power of the country at large was to administer all these matters for the public advantage.

His Honour the LIEUTENANT-GOVERNOR said:—"I have not the slightest hesitation in supporting my hon'ble friend in his motion that this Bill be passed. My hon'ble friend, Mr. Cockerell, observed that the measure had been before the Legislative Council since 1870; but I must remark that it has been before the Government of India since February 1867, having then been sent up by the Panjáb Government. I think, therefore, that, if we had omitted to press on the Legislative Council the passing of this Bill at this season and at this place, we should have greatly neglected our duty.

"The hon'ble member has adverted to the lost experience of Messrs. Inglis and Robinson; but without saying anything depreciatory of the ability of these gentlemen, I must remark that Mr. Egerton and myself were, for many years, employed in these districts of the Panjáb, into which irrigation was introduced on the annexation of the country, and that we have that peculiar experience which could not possibly be enjoyed by gentlemen who have not served in the province. We have also had the benefit of Sir Richard Temple's experience, who, for many years, was employed in the Panjáb, and has full knowledge of all the circumstances connected with irrigation in that province.

"As regards the objection taken to the preamble, I may observe that the principle involved has invariably been put forward in all the Bills which have been prepared on the subject from time to time, and had the assent of the late Mr. Thomason and also that of the late Sir Henry Durand. The hon'ble gentleman (Mr. Cockerell) took exception to the provisions regarding the landlord's rates, and he observed that it was inexpedient to disturb the general effect of the revenue settlement; but in the Panjáb, I believe, this inconvenience cannot occur, certainly not for a long time to come.

"As regards the compulsory rate, I was originally amongst the opponents of the first draft of the Bill; but I fully accept the compromise which is offered in this Bill; and I think, if the hon'ble gentleman had gained, as he admits he has not had the opportunity of gaining, experience in a country liable to the effects of drought, he would have set a higher value on the inestimable advantage of the presence of water near lands irrigable. I cannot myself admit that it is in any way inequitable to put a rate upon land which the owner has it in his power to improve by bringing water to it, under the conditions proposed in the sections of the Bill. It must be remembered, also, that the Government is co-proprietor in the lands of this country, and that it has not only the strongest interest in insisting, but a real right to insist, upon the improvement of land; and it seems to me that the proprietor who had it in his power to irrigate land and refused to do so under the conditions of this Bill, would be very much in the same condition as the tenant in England who refused to manure his land against the customs of the locality in which he lived.

"I consider that the hon'ble gentleman was under a misapprehension when he said that lands already irrigated from wells could be brought under this compulsory rate; but my understanding of section forty-eight of the Bill renders this impossible.

"The hon'ble gentleman has further taken objection to the levy of forced labour for the repairs of canals in the Panjáb; but in a country like that bordering the Indus, it would be absolutely impossible to bring the crops to maturity unless this labour were forthcoming at a particular time of the year; and although the hon'ble gentleman's objections were more pointedly addressed to the levy of forced labour in the more populous districts about the Sutlej and the Beas, I presume that, even there, the breaking of a bund or the overflow of a river, unless labour was immediately procurable, might be attended with most disastrous results to the agriculture of the country. I agree mainly, however, in the general views expressed by the hon'ble gentleman, and, except in cases of necessity, I should have the greatest possible objection to permitting the enforcement of labour.

"There is only one other remark which I wish to make, and that is with respect to the Sarda Canal. The project was submitted to me before I left Oudh, and I cannot understand how it is supposed to pass through a country already irrigated. Certainly in the Khérí and Sitapúr districts the water is very greatly wanted."

The Hon'ble SIR RICHARD TEMPLE said:—"As I consider the principles involved in this Bill to be important, I have listened carefully to the objections urged against it by my hon'ble friend Mr. Cockerell, and I desire to reply briefly to them, or at least to the chief of them.

"In the first place my hon'ble friend considers that the Bill, instead of being applied to the Panjáb alone, as proposed today, ought to be applied to the Panjáb and the North-Western Provinces together. He asks me whether this is right, and whether the land revenue of the North-Western Provinces is not suffering from the want of some such law, and he appeals to me in order to know what the intentions of the Government of India are. My hon'ble friend will doubtless see on reflection that I cannot fully state the intentions of Government on a matter which depends on the action of other departments besides my own (the Financial). But this much I will say. I support the Bill for the Panjáb on the plain ground that it embodies valuable principles and is accepted by the Panjáb Government in whose territories this Council is sitting today. I hope that a similar Bill may be soon passed for the North-Western Provinces, and I will do my best to promote the passing. We are not at this moment in possession of the concurrence of the North-Western Provinces, but that is no reason why we should have delay in the Panjáb. Meanwhile I am not aware of any particular loss to the land revenue occurring from this delay.

"Mr. Cockerell next adverts to a recent despatch from the Secretary of State regarding what is known as the 'compulsory rate,' that is, the rule whereby a water-rate can be imposed on lands which are proved to be capable of canal irrigation. He seems to think that this rule, as in the Bill today, is contrary to that despatch. On reference to the despatch, however, I do not see how my hon'ble friend's construction of it can be maintained. No doubt that despatch did advert to the difficulty of enforcing the principle and did direct that caution should be exercised. But after that it went on in the following terms:—

"'The object aimed at in the section (*i. e.*, regarding the compulsory rate) is obviously 'that of adjusting the burden of interest on loans raised for State irrigation works and trans-'ferring it from the shoulders of the general tax-payers to those of the communities for whose 'special benefit the works are severally undertaken, and in the value of this object, so far as it 'can be justly and conveniently obtained, I entirely concur; and it will therefore be satis-'factory to me to learn that the section can be so far modified as to obviate any objections.'

"So far then the principle is approved and not objected to as Mr. Cockerell seems to think. Then, after suggesting certain modifications, the despatch runs thus:—

"'A preferable arrangement might be one according to which cultivators, instead of paying 'in proportion to the quantity of water taken by them, that is, more in a dry year and less in 'a wet one, would be assessed at an equal rate per acre of their irrigable land in all years * '* * *. It would, however, rest with Government to fix the rate; and whatever 'rate * * * seemed necessary to raise the required percentage on the cost of the 'canal might be fixed accordingly.'

"Here, again, it is distinctly contemplated that under certain circumstances, a rate may be imposed on irrigable lands, and that such rating is to be fixed by Government on financial considerations. I shall advert presently to the details of this proposal. At this moment my object is to show that we are distinctly authorized by the Secretary of State to legislate on the subject.

"Mr. Cockerell then alludes to the analogy of municipal taxation in towns and cities; he considers that such taxation may be justifiable, because those

who pay it are directly benefitted thereby. He seems to think that the analogy does not apply to the proposed compulsory rating of irrigable lands. But I say that it does apply most distinctly. For will not every man who may be charged with this water-rate benefit thereby? Undoubtedly he will. He will only be so charged when it can be proved formally that he can and will benefit. Indeed the payer of this canal water-rate would benefit quite as directly by the irrigation of his fields as any townsman could benefit by the conservancy of the streets or by the improved purity of drinking water and the like.

"But if Mr. Cockerell introduced this analogy at all he ought to have pursued it further. He should have alluded to the local cesses for roads, schools, hospitals, and the like, which have been passed of late, province by province, for the whole of India. It is held by the legislature that, inasmuch as the community benefit by these things, they must be taxed. And it is considered that it is more just that such community should be taxed separately for its own roads and schools and hospitals than that the cost should fall on 'the general tax-payer,' that is, on the revenues generally. But if this be so, then it would be equally just to charge each rural district for the canals running through it, inasmuch as a canal is at least as useful as roads and schools, indeed is perhaps more useful than any other work, perhaps even than all other works put together.

"Again, the payer of cesses for roads and schools and hospitals does not always benefit so directly as the payer of a canal water-rate. A man may be taxed for roads, though he never travels, for schools, though he has no children to educate, for dispensaries, though he never takes physic. But a man will not be compelled to pay water-rate unless it be proved that his fields can be profitably irrigated, and that the water has been brought to their boundaries.

"Therefore I say that the analogy does not, as Mr. Cockerell seems to think, militate against the canal-rate, but is actually in its favor.

"Then Mr. Cockerell quotes a passage from a letter from the Government of the North-Western Provinces, to the effect that a man may be charged for water which 'he finds it not his interest to take.' How in Northern India—or anywhere in India, save in exceptional alluvial districts—it can be otherwise than for a man's interest to take canal water if it be obtainable, I cannot understand. Notoriously it is always for his best interests to take the water; and, if so, it is just to charge him.

"But the passage which my hon'ble friend quotes is only a specimen of dicta which are too common in many quarters and which involve a misapprehension, as I will endeavour to explain.

"It seems to be supposed that if it be really for a man's interest to take canal water, he will 'find' it to be so. But unfortunately in India he does not always 'find' this, or finds it only after a long delay. If our people were quick in apprehension, energetic and enterprising in disposition, they would indeed find their true interest fast enough. But they are notoriously slow, apathetic, and unenterprising. I say this without forgetting the many virtues which they do possess. And it can be proved in tens of thousands of instances that they have failed or delayed to take canal water for years and years, which nevertheless it was their true interest to take. Their taking it at last shows that they ought to have taken it from the first. I have learnt from the best departmental authority, and indeed the fact is patent from the statistics of irrigation, that whenever there is a drought there is an immediate extension of irrigation. When the drought ceases, and the seasons become good again, the irrigation, once begun, is maintained. This has occurred over and over again with tens of thousands of acres. The fact proves that in all these instances the water which was all along available might with every advantage have been taken from the first, and that the people were wrong in not taking it, and in not finding out their true interest sooner. When they find it out later, it is only after some terrible teachings from famine or distress.

"It is true that extension of irrigation arises from other causes besides, such as development of subsidiary channels; but after allowance for all this, the fact, as I have just set forth, remains.

"Again, if ever a people had an awful lesson of the consequences of drought, it was the people of Orissa. They saw the terrible mortality from famine when the rains were withheld. Nevertheless when shortly afterwards canal irrigation was brought to their very fields, they refused to take the water, because they would have to pay for it! I have heard, though I would fain hope that this cannot be altogether correct, that the land-holders incited the tenants to refuse, on account of some fancied object. Be this as it may, I believe that there have been at times combinations with this view, and a considerable reluctance to use the water. Of course it *is* the interest of the Orissa people to take and pay for the water, though they often fail to find it out.

"Fortunately there has not as yet been any such tendency observable in the Panjáb. The seasons for the last decade of years have been very dry there. But I can remember cycles of wet seasons when sandy unirrigated soils, usually unproductive, became very productive without any outlay of capital, and placed the irrigated lands, cultivated with outlay of capital, at an unusual disadvantage; glutted the markets with produce; caused prices to fall; rendered it difficult for the farmers to get money wherewith to pay the revenue; and caused much economic disturbance. All this will be found in the Panjáb Reports for 1855-56. Now, if such circumstances recur, as they easily may, it is quite conceivable that the Panjábees might try to escape paying for canal water, quite forgetting that such payment is really their insurance against cycles of dry years, which are more frequent than wet years, and forgetting that if they who benefit do not pay for the canals, the cost must fall on somebody else, and will actually fall on the general tax-payer.

"Then Mr. Cockerell stated that cultivators might have substantial reasons for not taking canal water. I felt curiosity to hear what these reasons could possibly be. At length my hon'ble friend gave one such reason, which was this, that the men might have wells and therefore did not want canal water; evidently supposing that well irrigation is sufficient and is nearly as good as canal irrigation. Such, however, is not at all the fact. In many parts of Northern India indeed the wells are very efficient, and have solid masonry. But, at the best, irrigation from wells is nothing like as good as irrigation from canals. The well irrigation is wholly insufficient, however useful up to a certain point, to ward off the consequences of drought; whereas canal irrigation does, to a considerable degree, suffice. Further, both in the North-Western Provinces and in the Panjáb, so completely does canal irrigation supersede the use of wells that I have seen regret expressed that more water had not been reserved for tracts which had not even the advantage of wells.

"The existence of well irrigation therefore, though it may be a reason for the canal officers reserving some part of the water for less favoured tracts, is not in truth a 'substantial reason' for a cultivator refusing canal water if it be offered to him.

"I heard Mr. Cockerell state that the power of levying a compulsory rate would place too much power in the hands of the canal officers, and would leave them less motive than heretofore to induce the people to take water by making the administration popular. But in fact, does the Bill place any such power in the hands of the canal officers? Not at all. According to the Bill the canal officer has no power to take any such steps at all; he cannot at all say to an individual 'if you do not take the water you shall be made to pay.' The process is this, according to the Bill. It may be reported by the Canal Department, or the local Government may otherwise have reason to believe that a reasonable use is not being made of the water. The local Government will

then order an independent enquiry, quite irrespective of the canal officers, to be made. After that the local Government may report to the Government of India, the sanction of which latter authority is necessary to the levying of the rate in the district. I shall notice presently the equitable precautions laid down for the levying of the rate. I have said this much here, in order to show that it is quite incorrect to suppose that this Bill proposes to place any taxing power in the hands of the canal officers.

"Next Mr. Cockerell says that we may well fear that there will be errors in design, and failures in execution, of the new canals, because, as he pointedly remarked, there have actually been such misfortunes with some of the new barracks! He adduces nothing of the sort in respect to the Canal Department; the remark is confined to the barracks. But why, when we are on the subject of canals, should adverse instances be imported from the barracks? Because, as I imagine, no such instances can be found in respect to the Canal Department. If my hon'ble friend wishes to forecast the future of our canals by instances from the past, why does he go to barracks and military works, which have nothing to do with the subject? Why does he not resort to the canal works themselves? Let him go to the head works of the Barce Doab Canal on the banks of the Ravee; or to Hurdwar on the Ganges, or to the head works just commenced for the canal from the Sone, or to the anicut across the river Muhanuddy in Orissa, or to the vast weirs and the net-work of channels in the Deltas of the Godavery and the Kistna, or to the canal system of Tanjore and the Cauvery; let him look at the designs just sent in for the canal from the river Sarda in Oudh, let him do all this and he will see what our Irrigation Department is capable of; he will find that it reflects honour, indeed lustre, on the British service in India; that it is not surpassed, perhaps hardly equalled, by any similar department in the world; that it is an enduring monument not only of the beneficence of our Government, but of our power of carrying beneficent designs into execution.

"Then Mr. Cockerell said that it would be unfair to saddle the cost of a canal which has failed on the community through whose villages it passes; and that such loss ought rather to be borne by the general tax-payer, that is, by the whole country. Now, these remarks seem to me to arise from an utter misapprehension of this part of the Bill. The Bill is purposely so drafted that the rate cannot possibly be levied if the canal has at all failed, and can only be levied when it has palpably and demonstrably succeeded. On turning to the important section fifty, we find that the compulsory rate can only be levied—

"'When the following conditions are complied with: (*a*) that the land is cultivated, but not irrigated; (*b*) that the net annual value of the produce of the land, or the productive powers thereof, will be increased by the irrigation thereof by canal water after deducting all necessary charges incurred in cultivating the same, conveying the water thereto, and paying all Government charges in respect of such irrigation; (*c*) that the divisional canal officer shall have tendered to the occupier or owner thereof a supply of canal water sufficient for the irrigation thereof in the manner customary in the irrigation of land from a canal; (*d*) that the divisional canal officer shall have offered to the said occupier or owner to construct the works necessary for conveying the water to the said land under section fifteen, or (if the said occupier or owner shall so prefer) to apply the provisions of sections twenty and twenty-four for the construction or transfer of a water-course; or shall have tendered an advance of money sufficient to provide for the construction of the said works; such advance to be repayable in conformity with the rules for making and recovering advances made under the Act for the time being in force as to advances for improvements in land.'

"Manifestly the proof of the canal is in the water! If the water is tendered as set forth in the conditions I have just quoted, the canal cannot have failed, and the cultivator can only be made to pay when he receives water from a canal which must, from the essence and nature of the conditions, be in an efficient working order.

"Then Mr. Cockerell quotes from a report which states that the projected Sarda canal will pass through a country already irrigated by 'kucha' wells, evidently thinking that such a tract will not really need canal irrigation

and should not be made to pay for the same. In the first place the Sarda canal as now designed is not to pass through a country thus irrigated. But if it were so designed, then would the fact of its passing through such a tract be any sort of proof of its not being imperatively needed? Is irrigation from 'kucha' wells, in the least degree, a substitute for canal irrigation? Assuredly not. What is a 'kucha' well? Why it is just a hole dug in the ground where ordinarily water is met with near the surface; it is unsupported by masonry, and is altogether of a temporary and uncertain character. So long as the rains are propitious, as the clouds drop fatness, as moisture is retained in the ground, these kucha wells are serviceable. But on the slightest stress of drought, or failure of season, they inevitably become useless. Their existence therefore furnishes no reason whatever for canal water being not introduced and canal rates levied. Indeed the remarks I am combatting run counter to the fundamental principle of canal irrigation in Northern India. We want something more reliable than the periodical rains, than the kucha wells which constitute the lowest and most precarious kind of irrigation, than even masonry wells of the better sort. These things depend on climatic considerations, which meteorological experience has shown to be dangerous to life and property. We cannot depend on local supply of water for Hindostan. But there is one supply of water which we can, comparatively, depend upon, and that is derived from the mighty range of Himalayan mountains which overhang Hindostan. There Providence has stored an infinite quantity of snow and glacier, and perennial waters, for the use of man, for the sustenance of the people who dwell in the arid plains below, if we will only learn, by application of science, to utilize these natural advantages, and if the agriculturists will submit to the pecuniary sacrifices necessary thereto.

"Lastly, Mr. Cockerell objects to what he terms the 'forced labour' sections, that is, to those sections, seventy to seventy-three, which authorize the agriculturists in certain districts to be required to supply labourers (on due remuneration) for maintaining the canals which pass through those districts, and which prescribe penalties for refusal or failure to comply with such requisitions. In other words there are certain districts where every able-bodied villager must, at certain fixed periods, or on emergency, turn out to repair the canals, on which the very food of the community depends. My hon'ble friend deems it improper to sanction such a practice by law, and says that this reduces the people to a state of serfage. What, however, is the fact? The practice is an old established custom, long anterior to British rule. The people are so situated that absolutely they cannot live or exist without it. If it be not authorized by law, they must somehow enforce it by arrangements among themselves. The districts where it prevails are insalubrious and isolated, almost rainless, dependent solely on canals from certain great rivers, dependent further on a certain supply of labour for repairs of canals, yet far distant from ordinary labour markets. The people are therefore driven to rely on themselves, and every able-bodied man must put his hand to the work, on which indeed his own bread, as well as the bread of all his neighbours, depends. The custom is thus necessary; and if it must exist, then it had better be authorized by law, and thus be brought under due check. My hon'ble friend seems to think that it might be gradually abolished. I cannot foresee any chance of this. At present any attempt to obtain labour from a distance would probably lead to failure of the works, and would certainly lead to great waste of money. If a man refuses to work, when he knows that he is thereby practically compelling his brethren and neighbours to work for him, and is directly shifting his own burden to the shoulder of others—just as in the crew of a ship in a storm, one man skulking or shirking, puts more work on the rest—why he does, morally, deserve some mild punishment; and, if so, he may as well have it legally.

"I have now done with my hon'ble friend's objections. In replying to them I have developed my own opinion, which I shall only now state by way of recapitulation.

"We are to make canals, and they must therefore be paid for, that is, the interest on the capital laid out in construction must be paid regularly. Who is to pay this? The communities through whose lands the canals pass, or the General Treasury, in other words, that inexhaustible person, the general tax-payer?

"I should say that the community which benefits ought to be charged. If it be justifiable to tax people locally for roads, schools, and drinking-water works, and street conservancy, and so on—as the legislature holds that it is—then still more is it justifiable to tax a community locally for canals, which are more beneficial than any local work that could be named. From this point of view, the taxation for canals should be so arranged as to be limited to those classes who benefit directly or indirectly by the works. Still the principle remains; if there may be a road cess or a school cess, there may be also a canal cess. If the subject be impartially viewed, it will be found impossible to distinguish between the one and the other. If there may be local taxation for anything at all, there may be such taxation for canals. It is sometimes said,—'better give the people the boon without taxation; better not render a beneficent thing odious in this way.' But this sort of specious argument, if stripped of disguise, means that people like canal water best when they can get it, not wholly at their own expense, but partly at the expense of the country at large; that districts or communities are to enjoy the benefit of canals which are paid for partly by themselves and partly by other districts and other communities. If the public were to see the transaction in this light, they would hardly approve it. Is India generally to defray the charge of canals which affect certain districts or certain provinces only? If it were possible (which it is not) to take the sense of the majority, the answer would be in the negative. Yet in practice we have done, in Northern India at least, and are still doing, something of the sort. Great canals have been constructed; doubtless their returns will some day more than cover the interest on the capital; but such is not yet the case; meanwhile a large portion of the interest is being paid by the country generally. Certainly it is not paid by the communities or the districts who benefit by the canals; nor is it even paid by the provinces in which the canals exist; for these provinces, however valuable, are not what we call surplus territories, which yield something over and above the costs of their defence and administration. Without objecting to anything that may have been done heretofore, I am bound to say, financially, that we cannot always go on doing this. It seems to me that if canals in the future are to be made, the full interest on the capital must be obtained locally, that is, from the communities or districts benefitted directly or indirectly. The General Treasury cannot, and ought not to defray the charge as heretofore.

"But however sound this principle may be financially, the present Bill does not go so far as that. It limits the compulsory rating to the particular persons whose fields are irrigable, if not yet irrigated, and to whose boundaries the water is actually brought. The justice of this is plain. What reasonable motive could a man have for refusing to take and pay for the water? Perhaps the reason would be ignorance and apathy; perhaps a repugnance to incur the smallest expense for even a certain benefit; or perhaps a vague hope that he might go on a little longer in the old groove before the evil day of drought should come round. Yet from all this folly and hesitation, repeated in tens of thousands of instances, the individual suffers, for the drought overtakes him unawares, when he is unprepared by irrigation to face it; the community suffers from famine and its train of evils, which might have been averted by timely enforcement of irrigation; the State suffers in not recovering at the time the interest on the capital it has laid out for the benefit of particular places; and the loss meanwhile is inevitably, though not equitably, imposed on the country generally. It must never be forgotten that the Exchequer is in some respects only a synonyme for the country at large. Our Treasury balance

is only the residue unexpended of public money, drawn from the capital of the country and held in stewardship by us on behalf of the country. Therefore if any province or district unduly trenches on these cash balances for the construction of its canals, it really imposes a burden on other provinces or on the public generally.

"Therefore I say that the compulsory rating as limited and defined in this Bill is necessary, as the enforcement of a principle essential for the interests of the people as well of the State; for the State, as enabling it to apportion justly the burden of payment for works of material improvement; for the people, as protecting them from the consequences of their own improvidence.

"I have one more remark to make before concluding. This Bill embodies another important principle, that is, the levy of two kinds of water-rent, called now the owner's rate and the occupier's rate. Heretofore there has been only one kind of rate in the Canal Department, which corresponds to what we now call the occupier's rate. If the cultivator irrigates his field, he pays the occupier's rate. The landlord, who of course will get increased rent from land thus fertilized, will pay the owner's rate. This point is of great importance in districts where there are zemindars or other landlords. They will now have to pay owner's rate; otherwise they might, under certain circumstances, escape the payment of this just due. If the occupier be both cultivator and owner, as in the case of peasant proprietors, then he would pay both owner's rate and occupier's rate. Practically he does this now in many parts of the North-Western Provinces and the Panjáb: that is, he pays the canal water-rent and he pays an additional irrigation rate of land revenue. Though this process is sometimes complete, yet it is not always so, and its operation is uncertain, and at the best the irrigation revenue rate which is really canal income becomes mixed up with land revenue. The Bill makes all this clear. There will be no doubt of the State's obtaining its dues from the occupier or owner where they are separate, and the double rate where the two capacities are combined in one person; and the full sum of canal income will be properly exhibited. The Bill also provides that where the people are already paying the double rate under settlement, they shall not be made to pay any more now, though the designation of their payments may, as a matter of account, be changed.

"I have only now to express my hope that the Bill as amended by the Select Committee may be passed into law."

The Hon'ble MR. STRACHEY said:—"MY LORD: I propose, in the remarks which I am about to make, to confine myself to one part of the Bill only; that part which provides, under certain circumstances, for imposing compulsory rates on the owners of irrigable land. In regard to the other important subjects to which this Bill refers, I think that I need say nothing, because they have been already sufficiently discussed. We all know, my Lord, what a common practice it is, in arguing, to attribute to one's adversary all sorts of opinions which he never expressed, and never held, and, having demolished one's imaginary enemy, to triumph in an imaginary victory. I am sorry to be obliged to say that there has been a great deal of this kind of argument on the present subject. I shall now endeavour to state the reasons for which I believe it to be essential that the principle regarding which there has been so much discussion, and which is affirmed by sections 44 to 49 of this Bill, should be distinctly laid down by the law.

"Although there has been much difference of opinion regarding the exact manner in which that principle should be practically applied, the principle itself has been distinctly declared by the Government of India, for several years past, as one of essential importance. This has been repeatedly said in the published orders and despatches of the Government, and also by your Excellency and by Members of the Government in the Legislative Council. The

justice of that principle has been, with rare exceptions, acknowledged by the highest authorities connected with both the Supreme and Local Governments.

"The public hardly appreciates the serious financial considerations which are involved. Already, as Colonel Strachey stated last year in this Council, we have incurred, or are in progress of incurring, an expenditure on canals, in the North-West Provinces, Panjáb and Oudh alone, of more than £20,000,000.

"Other great undertakings of a similar character are going on in other parts of India, and Colonel Strachey informed us that before long the liabilities for works of irrigation would amount to an annual charge of several millions sterling.

"The duty of executing these works, if it can be done without extreme financial danger, is obvious; for in no other way is it possible to give real and complete protection to the country against the terrible famines, which, even to this day, periodically devastate the land.

"There is a common idea that these great canals not only pay all their expenses, but that they bring a great and certain direct return to the treasury. Unfortunately this is only partly true. There is doubtless ample reason for believing that these works will ultimately be highly remunerative; but it has been proved by actual experience, as my hon'ble friend, Sir R. Temple, has already observed, that this result often takes a very long time to bring about. In regard to the reasons which lead to this delay in obtaining the full benefits of the canal, I shall have to speak again presently.

"I will now only say that, without at all undervaluing other reasons,—such as bad management of our own officers, insufficient construction of subsidiary channels, and other causes which have often had much influence—I am satisfied that the main cause of this delay has been ordinarily the ignorance of the people, and their disinclination to embark in any novelty. They and their fathers before them, from time immemorial, have cultivated their fields with no water but the rain from heaven, or that raised laboriously from wells; and they can no more appreciate in a moment the advantages which the canal offers them, than the people of our towns can appreciate the value of clean streets and drainage, and wholesome water to drink. I will quote here a despatch, written about two years ago, from the Government of the North-Western Provinces, in illustration of this part of the subject. It was written regarding the projected new canal from the Ganges, and with particular reference to the irrigation of the autumnal crops, but it applies in principle to irrigation canals generally:—

"'As regards the projected *kharif* canal, it will be long before the people avail themselves fully of the contemplated autumn supply for other crops than indigo, sugar and cotton. In the Eastern Jumna Canal, the eventual proportion of nine-twentieths now taken by the people for *kharif* cultivation, is the result of an education of some forty years in the use and benefits of canal irrigation. The experience of the past year goes to show that, at the present time, cultivators in the Doáb wait looking for the rain from heaven, and only at the last moment, and therefore only in really bad seasons, resort to the canal in aid of the commoner crops. His Honour is not insensible to the benefits of *kharif* canals; and would, indeed, be glad to see the one projected by the Chief Engineer carried into effect, if it can be done with a due regard to financial considerations. But the Lieutenant-Governor holds strongly that, in the Doáb, irrigation from such a canal could not supersede, or stand instead of, *rubbee* irrigation; and also that, in calculating returns for capital invested in such an undertaking, the disinclination of the people in this part of the country must be borne in mind. Perhaps, on an average, one out of every five years may prove a failure, and lead the people to the canal for their ordinary autumnal crops; in the end, after a long series of years, they may have learned fully to appreciate and use the water irrespective of the season. But, certainly, for a considerable period the water would be but partially used during the monsoon, and the return in water-rate would be proportionally low. But delayed returns are equivalent to an increase of the capital invested; and the Lieutenant-Governor thinks that this point has not been sufficiently regarded in the calculations of the Chief Engineer.'

"There can be no doubt, I believe, that this is generally true. Ultimately, the people find out the value of the canal, and every drop of water is utilized

and anxiously demanded; but until this result arrives, the Government has to go on paying the interest on the borrowed money with which the canal has been made. So long as these works were upon a small scale, and constructed with such funds as could be made available from the annual revenue, the matter was one of minor importance; but now that we are expending on these canals millions of borrowed money, it becomes a matter of most urgent financial necessity that there should be no doubt as to the mode by which the interest on these charges is to be secured. The Government of India maintains—and this is the general principle which underlies the sections of which I am speaking—that if, after these works have been constructed, the income be insufficient to cover the interest on the capital charge, then the deficiency ought not to be borne by the general tax-payer, but by the particular districts which have benefitted by the canal, which, by its construction, have been protected against famine, and where the value of landed property has been enormously increased. That this principle is equitable and right, and that the other principle—that of throwing upon the tax-payers in distant parts of the country charges for works of local utility—is thoroughly inequitable and wrong, seems to me to be a proposition not open to doubt. It is a principle recognized in every civilized country, and it is now recognized in India in regard to all other classes of public works and objects of local utility. I should like to read to the Council what one of the wisest and most accomplished Statesmen who ever came to India, Lord Sandhurst, said upon this subject:—

"'It was but too true that there was a sort of feeling among certain classes of the public, this including, not only the ryots and the petty landholders, but even some of our own officers in responsible situations, that there was a kind of bottomless purse, into which all were free to dip their hands at pleasure for local objects, without any local responsibility of reimbursement, this unlimited treasury being what was called the Government.

"'We could understand the ryot or the petty landholder having this notion of the Sarkár; but it was difficult to comprehend how responsible officers charged with the care of administration, who were aware of the almost infinite demands on the Government, should fall into such errors of reasoning.

"'Well, this matter seemed to be fairly set right by certain clauses in the Bill. Some alteration in the wording, some modifications, might be required; but the principle according to which these works must be carried out henceforth was described in a manner admitting of no mistake in future.

"'It could not be too clearly declared that the provinces, the districts, the populations which benefitted by the reproductive works must be responsible for the expenditure incurred on account of them, and that this must not be thrown on the country at large or the system of general taxation.'

"There has been much discussion in regard to the manner in which this principle should be carried into practice. Although the procedure laid down in these sections of the Bill is absolutely just, and, so far as it goes, as it seems to me, beyond criticism, I do not pretend to say that, personally, I think it goes far enough. The Bill is, I think, needlessly tender when it provides that no compulsory rate shall be levied except on those owners of irrigable land the value of whose property has been directly increased by the canal, and who can certainly, by using the water offered to them, re-coup themselves for the charge that is imposed upon them. I think it would have been simpler, and quite equitable, to make the incidence of the rate much wider, and to impose it upon all property within the districts certainly benefitted by the canal. My hon'ble friend, Sir Richard Temple, has already referred to the series of laws which have been passed for every province of India, laying down the principle that, if more roads and bridges and schools and hospitals and other works of local utility are required, they must be provided at the charge of the districts which want them, and not at the charge of the tax-payers in other provinces. I cannot conceive why canals are to be an exception to this general rule. It is of course true that the benefits of canals often extend beyond the local limits of the country through which they pass. The same may be said of almost every great work of public utility; but there can be no question that no works exist of which the purely local benefit is so certain and so immediate as that of an irrigation canal. I

will give an example: A few months ago an Act was passed authorizing the imposition, in the permanently-settled districts of the North-Western Provinces, of a rate of two annas on every acre of cultivated land, for constructing and maintaining roads and communications, for the police and district post, for schools, hospitals, lunatic asylums, markets, wells and tanks, and any other local works likely to promote the public health, comfort or convenience. I am altogether unable to understand how, if it is right to impose general local rates for such purposes as these, it can be wrong to impose them for works of irrigation, which afford absolute protection against famine, and which confer upon the people of the districts through which they pass benefits to life and property incomparably greater than those which any other public works can give. It must not be supposed that such rates would be heavy; they would never be required to meet the whole charges on account of the capital expended, but only to make good the difference between the actual income from the works, and the income required to protect the State against loss, and to secure the gradual repayment of the borrowed money.

"By no possibility could such a rate be heavy. I may give an illustration. It has been proved in the case of the greatest and most expensive project of canal irrigation ever proposed in Northern India—that of the Sardah Canal (I speak of the project in its original shape, for it has been subsequently greatly cut down)—that the financial success of the scheme could be placed beyond doubt, and a return of at least seven per cent. on a capital of £5,000,000 sterling be rendered certain, by imposing a general rate of one and a half anna, or about two pence farthing, per acre on the cultivated and culturable lands through which the canal will pass. The average rate at which the Government land revenue now falls upon these lands is about two rupees an acre. If this were increased to two rupees one anna and six pies, the people on whom the rate was levied would be for the most part absolutely ignorant that any fresh charge had been put upon them, while they could not help knowing that they had received a blessing of almost incalculable magnitude. Surely this is a fairer way of protecting the finances of the empire against loss, than imposing taxes on the people of Calcutta, Madras and Bombay for the benefit of the people of Oudh.

"The present Bill, while it generally affirms this principle of local responsibility, applies it in practice only to a limited extent. These sections, as my hon'ble friend, Mr. Ellis, has observed, represent, in fact, a compromise between two opinions, both of which, however, admitted the general principle at stake. It has been thought better at present to confine the power of imposing a special water-rate to those cases in which it can be proved that the water might be taken with actual profit to the proprietor if he chose to take it, and that, after taking the water and paying the rate, the annual value of his land would be greater than before. Most elaborate safeguards have been inserted in the Bill to prevent the possibility of hardship to individuals. They are so elaborate that I am afraid it will not be easy to apply them in practice.

"They err, however, on the safe side. They are entirely in favour of the people and against the Government. My hon'ble friend, Sir Richard Temple, has already stated to the Council, and I therefore need not repeat, the conditions which must be fulfilled before this special rate on irrigable lands can be imposed. My hon'ble friend, Mr. Cockerell, quoted with approval to the Council, a description of those conditions from a despatch lately received from the Government of the North-Western Provinces. With your Excellency's permission I will again read to the Council the same passage:

"'As the Bill now stands, this extraordinary rate may be imposed on the report of an officer that the owner and occupiers of lands irrigable by such canal have not made reasonable use of the canal for purposes of irrigation.' * * * 'The measure will simply be based on the opinion that 'reasonable use' has not been made by the people of the canal, and, on this opinion, an agriculturist who never took a drop of water from the canal, or intends to take it, who finds, in fact, that it is not for his interest to bring water-channels to his fields, can be charged a special rate which may reach to two rupees an acre. The injustice of such a proceeding seems to be patent on the mere statement of it.'

"Certainly, my Lord, the injustice of such a proceeding would be patent; but why should the intention of any such proceeding be attributed to the Government of India? Not only has this Government never contemplated such injustice, but I affirm that there is not a word in this Bill to justify the charge. The simple answer to objections of this character is, that they are objections to propositions which have never been made, and to provisions which have no existence in the Bill; and that under no circumstances whatever will it be possible to impose the special rate upon any land, unless it can be proved, not only that it is irrigable from the canal, but that such irrigation will certainly increase its nett annual value. No rate can be imposed on account of the canal until the value of the land has been actually increased by the construction of the canal. This answer also completely meets the objection that the power of imposing compulsory rates may encourage the execution of extravagant and unremunerative projects. It will be impossible for the Government to throw upon any one any loss arising from any such causes; for no one can be called on to pay who may not, if he chooses, derive a greater benefit from the canal than any charge which can be placed on him. It is said 'it would not be equitable to levy the special rate from those who never touched the water.' Now, I ask the Council whether something precisely equivalent is not done in hundreds of cases with which we are all familiar? I will give one illustration—the water-works of Calcutta. In this case, the Municipality—which, notwithstanding what has fallen from my hon'ble friend, Mr. Cockerell, on the subject of Indian Municipalities, I affirm to be virtually nothing more than a branch of the Government—borrowed half a million of money, and brought into Calcutta an excellent supply of pure water. To cover the charges for this work, a compulsory water-rate is imposed upon all owners and occupiers of houses in Calcutta. A few years ago, there was a violent opposition on the part of a certain very orthodox section of the community against the gross injustice of being made to pay for water they did not want, and which they would never touch. 'It is true,' they said, 'we could use this water if we chose, and you are pleased to think that we should be the better for it. We think differently; from time immemorial we and our forefathers have gone on without these new-fangled notions; you may say, if you like, that the water which we drink is a filthy fluid scooped up out of noisome tanks. We are satisfied with it, and we protest against the injustice of being made to pay for water which nothing shall induce us to use.' These objections did not prevail. The Government was not prepared to relieve these people from payment of their share of the water-rate. It virtually said to them, 'you can use the water if you like, and it will be as beneficial to you as to your neighbours to be saved from cholera, and to have your streets made clean and wholesome. We refuse, on account of your objections, either to throw an additional burthen on your neighbours who drink the water, or to tax people in other parts of India.' The objectors paid their water-rates, and now, I am happy to say, they have given up all their objections and have taken to drinking the water. The parallel is a perfectly fair one. We propose to do nothing more; we propose, indeed, to do very much less, in the way of imposing compulsory water-rates upon people who can, if they choose to do so, use the water to their own benefit, than has been done in Calcutta and Bombay, and in half the cities of the civilized world.

"But, my Lord, there is another reason of great importance to which my hon'ble friend, Sir Richard Temple, has already referred, which makes it especially right to bring some pressure to bear upon agriculturists whose ignorance or dislike of change lead them to delay in availing themselves of the benefits of irrigation which are offered to them. If these people only injured themselves, we might leave them alone. If the result of their refusal to use the water were only an additional pecuniary burden on their neighbours, or on the general tax-payer, the matter would be more serious; but still the loss would be one that could be measured in money. Unfortunately, this is not the case. These canals are primarily constructed to save the country from famine, and if the water is not taken, the country is not protected.

Thus, the ignorance of the agriculturists, and their disinclination to adopt new systems of cultivation, defeat the object with which these great works are undertaken. It is a fact that has, in my opinion, been conclusively proved by experience in various parts of India, that it is mainly under the pressure of famine and scarcity, and failure of the periodical rains, that irrigation makes really rapid progress. So long as the seasons are tolerably favourable, people go on in their old ways, and do not take water from the canal. There comes a failure of the rains. Then there is a rush for water, and people learn the advantage of the canal. Having once or twice broken through their old habits, they give them up and continue to take the water regularly. But this experience is gained at a fearful price to the country. It is lamentable to think of the lives that have been sacrificed, and of the vast amount of property that has perished, during the last ten years, to say nothing of earlier periods, in consequence of the difficulty and slowness with which these ignorant peasants learn the real value of canal irrigation. The present sections may, I hope, act very advantageously in placing upon the owners of irrigable land, instead of the terrible pressure which is now brought to bear by natural calamity of season, a pressure of a different and purely beneficial kind. This pressure may induce them to co-operate with the Government in extending irrigation, and thereby obtaining for themselves, and for the country generally, the only effectual remedy against the utter ruin which too often falls upon them in the shape of famine.

"I have one other reason to give in reply to the objections that have been made to these sections. The power which the Government now proposes to declare that it possesses is in principle strictly similar to that which is recognized by the existing law as possessed by every proprietor of land. I believe this to be true of the whole Bengal Presidency. It is certainly true of Bengal and of the North-Western and Central Provinces. It has been ruled by the High Court of Allahabad that, when a landlord provides facilities for irrigation, of which his tenants with occupancy rights can avail themselves if they choose—if, that is, the landlord at his own cost makes unirrigated land irrigable—he may claim an enhanced rent from his tenants.

"'It is true,' say the High Court, 'that a landlord cannot compel a tenant to use water from wells or other works constructed for facilitating irrigation; but if a landlord construct such works, and provide facilities for irrigation of which the tenants may, without expense, avail themselves; if he brings the water to their holdings, we are not at all prepared to hold that he could not, after the service of a proper notice, enhance the rent-rates paid by tenants of the holdings to which such facilities were given, up to the rates paid by tenants of a similar class, holding *lands with similar advantages* in places adjacent. A tenant of unirrigated land, if his landlord makes that land irrigable without cost to the tenant, must pay at the rates paid by other similar tenants for irrigable lands in the neighbourhood. If this were not allowed, landlords would have no motive for improving occupancy holdings, a conclusion at which we should arrive with much reluctance.'

"Nor is this all. It has been ruled by the High Court that a 'proprietor is clearly entitled to claim an enhanced rate of rent in consequence of the productive powers of the land having been permanently increased by the proximity of the Ganges Canal independently of the agency of the ryot.' So, also, it has been, on more than one occasion, ruled by the High Court of Calcutta, that a tenant is liable to enhancement of rent when the productive powers of his land have been increased by improvements constructed at the cost of Government. It comes therefore to this. The Government, the chief landlord of the country, asks only for a power which private landlords possess already. If the Government makes a canal, and water becomes available for the irrigation of an estate, the private landlord may say to his tenant—'Why do not you take the water that is at your disposal, and thus increase the productive powers of the land which you occupy? Why, on account of your neglect, and of your bad husbandry, am I to suffer, and get from you only the rent of unirrigated land? Take the water and increase the value of your holding, and pay to me in future a rent proportionate to the real value which the land now possesses, and equal to that which good tenants, your neighbours, who have availed themselves of the advantages offered to them, pay for similar land close by.' The Courts would support the landlord in his perfectly reasonable demand. We now ask the legislature to acknowledge that the State possesses similar rights, and that it may equitably demand to receive from those who are virtually its tenants, a similar return for the improvement by which it has permanently increased the value of the land.

"My Lord, I have only one thing more to say. My Hon'ble friend, Mr. Cockerell, has told the Council that there have been many protests and expressions of disapprobation against this Part of the Bill from many eminent public officers. I admit that the high authority of Sir William Muir may be quoted in support of the views of my hon'ble friend. But with this exception, to which I fully concede that high importance must be attached, I venture to assert that it would be difficult to quote a longer list of eminent names in favour of any great measure which has lately come before this legislature, than can be quoted in support of the main principle involved in these sections. I will not refer to the opinions held by your Excellency, or by any one who is now a member of this Council. But it ought to be remembered that the justice of the principle now under discussion was admitted and advocated by Sir Henry Maine, by Sir Henry Durand, by Lord Sandhurst, and by Sir Donald McLeod; that it has been accepted by three successive Lieutenant-Governors of the Panjáb, and by three, out of the four, Local Governments of Northern India."

His Excellency THE PRESIDENT said:—"I am content to leave to public judgment, in reference to the important principles involved in this measure, the statements that have been made to-day by my colleagues.

"I am glad a discussion has taken place, because the principle which is contained in portions of this Bill has been for some time rather lost sight of; and it is a matter of satisfaction to me that an opportunity has been given to those who think them right and sound to explain them in the able and complete manner as has been done to-day.

"I have really little to add to what has been said in the discussion now about to close.

"I will not refer to the amendment immediately before the Council. It appears to meet with little favour. At this I am not surprised, for it suggests that this Council should discuss, in the enforced absence of those who are best informed and most interested in the matter, a question which most intimately affects, and affects only, the province in which we sit.

"It seems to me that the observations of my honourable friend contained, from the beginning of his speech to the end, an enunciation of principles which, if they were carried into effect, might prove the doom of those great works in which we are engaged.

"It is twenty-five or thirty years since great irrigation works were begun in Northern India; the circumstances of the country are much changed since then. At that time they were conducted on no distinct financial principle; the annual expenditure was not very large, the money to carry them on was generally found according as it was wanted, and the payments on account of interest had not become serious in amount; but, as the wants of the country developed, and the great and important character of these works was perceived, all wise men who looked to the future of our financial position discovered that, if these works were to be carried on at all, they must be continued on a fixed principle.

"Government then determined on distinguishing the expenditure involved thereon from the ordinary expenditure of the year.

"In that they recognised the principle that these great works should be carried on only on the assumption that they were to be, to a great extent,

reproductive, and that their finance was to be, as far as possible, separated from the ordinary finance of the empire.

"The principle involved in the clauses which have been so much discussed to-day, and which contain, to a limited extent, the principle of a compulsory rate, is nothing more or less than the logical consequence of the policy which has been adopted for some years with regard to these great works—the principle that local works of a beneficial character should be, as far as possible, defrayed from local resources.

"It is said that this is a question of principle as between the Government of India and some of the Local Governments. For my own part, I cannot too strongly express my satisfaction at having heard from the most distinguished member of the Local Administration, that the clause does not in any way involve a question of principle as between the Supreme and Local Governments. But if we talk of a principle of this kind being discussed between the Local Governments and the Government of India, without laying myself open to any accusation of presumption, I may say that it is the Government of India whose duty it is mainly to decide. The Government of India appears in this case in the joint capacity of a body who are responsible for the general interests of the country, who represent that co-partnership in the land, which is the property of the public, and who are also in the position of the lender who has to lend trust-money for certain purposes, and whose duty it is to see that it is lent on good and sufficient security.

"Therefore, as between the Government of India and the Local Governments, I am bound to say the position of the Government of India, and the responsibilities which attach to it, are tenfold greater than any responsibility that can possibly attach to a Local Government in such a matter.

"I know that we are as anxious as any Local Government that these works should be carried out to the utmost extent.

"I do not believe that any Government that ever ruled in India recognised more thoroughly than we do, the enormous advantage of these great works of irrigation, and the paramount duty that lies upon us to promote them by every means in our power.

"But we believe that, by adopting these principles of sound, and, perhaps, apparently severe, finance—and by no other means—the certainty of a continuance of these works can be secured. We believe that if you attempt to throw upon the general resources of the empire at any time huge burdens in the shape of expenditure, which will necessitate unpopular, onerous and almost impossible, taxation, the certain result of such a step will be the stoppage of all useful works.

"The extent to which this good principle ought to be carried out is, according to my view, not sufficiently developed in this Bill; but the measure is good as far as it goes, and I believe that, in its working, it will have the double effect of making those under whose authority and under whose direction these works are constructed very much more careful as to economy and efficiency of construction than they would otherwise be; and it will also have the effect of affording to the Government, which is only another term for the general public, great additional security against loss.

"If it has that effect, it will be impossible for any future Administration materially to limit the construction of irrigation works which are wisely designed, and which can certainly be completed without immoderate charge upon our annual revenues.

"It has been said that, if errors in design and mistakes in construction occur, the incidence of re-payment should be changed and placed on the shoulders of the people at large.

"I can see no force in that argument, and really, when we come to details, we find that the officers who conduct these works, and are really entrusted with

their construction, and to whose errors and mistakes (if they occur) misfortunes must be attributed, are more under the influence of the Local Governments, than under that of the Government of India.

"Who are the officers who are now conducting these works? The officers of Local Governments; and, though these officers require no such incentive to the due exercise of their duties, still, the fact of their being officers of the Local Governments, and under the control of the Lieutenant-Governors and Chief Commissioners of those provinces in which the works are undertaken, must have the effect of making them careful and energetic.

"I think that is sufficient to shew that there is no strength in the argument that, because it is possible that errors in design and mistakes in construction may be committed by the officers of Provincial Governments, therefore, the whole people of India should pay.

"It has occurred to me through the whole of this discussion that a sort of anxiety is apparent that, in an expenditure which is incurred for the sole benefit of a particular class or district, some other class or distant province ought to partake in the liabilities, and should, under certain circumstances, be made to pay.

"This puts me in mind of the old saying of Sydney Smith—'Charity is common to mankind. A sees B in distress, and he is most anxious that C should relieve him.'

"I cannot help thinking that this is the sort of feeling which underlies many of these propositions, and there is an intention or a hope, that those who benefit should pay a good deal, but that, under certain circumstances, others should be bound to contribute.

"I do not think that any great undertaking, whether it is in private or public hands, can ever be successfully carried on, on such principles.

"My hon'ble friend, Mr. Strachey, has alluded to a most apt parallel, in quoting the Calcutta water works.

"It is the principle which has been adopted with success, not only in India, but in Europe, where it has always been laid down that, where a great local work is undertaken for the benefit of the majority, there is nothing improper—nay, that there is absolute justice—in making every one who may be benefited pay his share, whether he accepts the boon derived from the undertaking or not.

"The principle has been carried out in all our great works at home. It would never have been admitted for a moment that, if, for instance, a great drainage canal is made across a man's estate, which must enrich him as well as all his neighbours, and if he prefers to leave his land to the occupation of wild ducks and snipes, instead of growing clover and corn, therefore he is to escape paying his share for a boon by which the whole country is benefited.

"I believe this principle can, through the agency of our officers, be carried out without the smallest particle of oppression.

"I rejoice to hear from my hon'ble colleagues, the Lieutenant-Governor and Mr. Egerton, that the desire for obtaining water will be so great in the Panjáb, that it is probable that a compulsory rate will never be necessary.

"I believe that; and I do believe at the same time, that the value of laying down this principle by an Act in this Legislative Council is so great, that such assurances, however gratifying they may be, ought to have little weight with us. We are quite justified in adopting a general principle of justice and right as a precaution, notwithstanding that it is possible it may never be necessary to carry it into practical effect; but I believe that the knowledge that this principle is involved in the Bill, and may be enforced, will render the people more disposed to take the water; and we know that experience goes to show that, if once water is taken by the cultivator, the use of it is seldom completely renounced.

"I have only to repeat my belief that, if a strict, sound and straightforward system is pursued with regard to these works, they will go on, be self-supporting, and will create no future difficulty for the Government; but I believe at the same time that, if you endeavour to adopt the hap-hazard principle by which there is to be any uncertainty as to your security for these vast loans, and as to how and when and by whom such works are to be paid for—if a system of scrambling finance is to be adopted with regard to them—they will become a source of serious difficulty and much damage, and that those who resist such wise and necessary precautions and oppose measures similar to this (though they may have the best intentions) are really obstructing, hindering and possibly endangering, the future success of the most beneficent undertakings that any Government has ever promoted for the welfare of its people."

The amendment was then put and the Council divided—

AYE.	NOES.
Hon'ble Mr. Cockerell.	His Excellency the President.
	His Honour the Lieutenant-Governor of the Panjáb.
	Hon'ble Mr. Strachey.
	Hon'ble Sir R. Temple.
	Hon'ble Mr. Stephen.
	Hon'ble Mr. Ellis.
	Major General the Hon'ble H. W. Norman.
	Hon'ble Mr. Egerton.

So the amendment was negatived.

The Hon'ble MR. EGERTON'S motion was then put and agreed to.

The Hon'ble MR. STEPHEN, with the permission of His Excellency the President, moved as amendments—

That the following clause be added to section eight, after clause (3):—

"(4). Injury done in respect of any water-course or the use of any water to which any person is entitled under the law relating to the acquisition of ownership by possession:"

Also that the following clause be added to the same section, after clause (*e*):—

"None of the advantages referred to in the above clauses (*a*), (*b*), (*c*), (*d*) and (*e*), shall be deemed an easement."

The Motion was put and agreed to.

The Hon'ble MR. EGERTON then moved that the Bill as amended be passed.

The Hon'ble MR. COCKERELL moved, by way of amendment, that sections 44 to 49 inclusive be omitted, and that the numbers of the subsequent sections be altered accordingly.

MAJOR GENERAL the Hon'ble H. W. NORMAN said that, after all that had passed with regard to this important measure, it was with much reluctance he was bound to express himself in support of Mr. Cockerell's amendment. He believed that, by the retention of the clauses under discussion, not only much injustice and, perhaps, oppression would arise, but much discouragement would be thrown upon irrigation projects generally; for it was quite clear that those who considered these clauses applicable to the Panjáb should endeavour to extend them elsewhere, and this no doubt would throw cold water upon the desire which now existed for various irrigation extensions. It seemed presumptuous in him to express an opinion contrary to these clauses which had received the sanction of the high authority of the Mover and, he understood, of the Lieutenant-Governor; but, having given a good deal of consideration to the subject, he felt he was bound to do so. While thoroughly agreeing with His Excellency as to the necessity for all irrigation projects being based upon sound financial principles, it seemed to him that these clauses were not required in aid of those interests or of those of the tax-payers. If anything of the kind were required, he believed that the clauses in question would be quite insufficient for the purpose. While they were unnecessary, they would be made the instruments of oppression, and, certainly, a means of holding out threats and of causing considerable apprehension.

He (MAJOR GENERAL NORMAN) was not aware that it was the case that, in any well-projected and well-constructed work of irrigation, devised to meet an actual want, there had been any want of financial success or a real backwardness on the part of the people in taking the water when once the canals had been brought into operation. While admitting that the clauses were guarded by some judicious restrictions, it did not seem to him that they guarded sufficiently against the evils to be apprehended. He also observed that, while a person could be compelled to take the water, these provisions did not appear to offer him any remedy against the Government in case the supply of water failed. It was a matter of great regret to him that His Excellency the Commander-in-Chief was not able to be present to give the Council the benefit of his experience of canals, both in the Panjáb and elsewhere, particularly as the Council must be aware that, from what His Lordship had said on a previous occasion, he would view the introduction of these clauses with much regret. The Hon'ble Member concluded his remarks by supporting Mr. Cockerell's motion.

The amendment was put and the Council divided—

AYES.	NOES.
Hon'ble Mr. Cockerell.	His Excellency the President.
Major General the Hon'ble H. W. Norman.	His Honour the Lieutenant Governor of the Panjáb.
	Hon'ble Mr. Strachey.
	Hon'ble Sir R. Temple.
	Hon'ble Mr. Stephen.
	Hon'ble Mr. Ellis.
	Hon'ble Mr. Egerton.

So the amendment was negatived.

The original Motion was then put and agreed to.

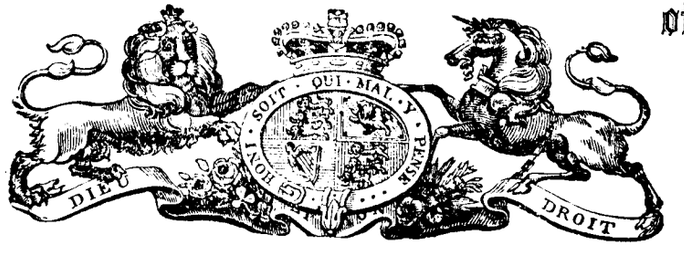
The Council adjourned to Monday, the 30th October 1871.

SIMLA,
The 26th October 1871.

H. S. CUNNINGHAM,
Offg. Secy. to the Council of the Govr. Genl. for making Laws and Regulations.

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OFFICIAL PAPERS.

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GOVERNMENT OF INDIA.

ABSTRACT OF THE PROCEEDINGS OF THE COUNCIL OF THE GOVERNOR GENERAL OF INDIA, ASSEMBLED FOR THE PURPOSE OF MAKING LAWS AND REGULATIONS UNDER THE PROVISIONS OF THE ACT OF PARLIAMENT 24 & 25 VIC., CAP. 67.

The Council met at Simla on Monday, the 30th October 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G. M. S. I., *presiding*.
His Honour the Lieutenant Governor of the Panjáb.
The Hon'ble Sir Richard Temple, K. C. S. I.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
Major-General the Hon'ble H. W. Norman, C. B.
The Hon'ble F. R. Cockerell.
The Hon'ble R. E. Egerton.

INDIAN WEIGHTS AND MEASURES OF CAPACITY BILL.

The Hon'ble MR. STEPHEN moved that the Report of the Select Committee on the Bill to regulate the Weights and Measures of Capacity of British India be taken into consideration. He had stated fully, on former occasions, the circumstances under which this measure was introduced: no alteration had been made in the original Act except to remove from it those portions to which the Secretary of State had objected; and it was therefore unnecessary for him to trouble the Council with any further statement on the subject.

The Motion was put and agreed to.

The Hon'ble MR. STEPHEN also moved that the Bill be passed.

The Motion was put and agreed to.

LAND-REVENUE PROCEDURE (PANJÁB) BILL.

The Hon'ble MR. STEPHEN moved that the Report of the Select Committee on the Bill for consolidating and amending the law as to Land-Revenue Procedure in the Panjáb be taken into consideration. He said:—"Although I have on a previous occasion stated at considerable length the reasons which made legislation on this subject necessary, and the principles on which that legislation should proceed, I fear that I shall have to trespass a second time upon the patience of your Lordship and the Council, in order to explain and justify certain modifications which have been introduced into the Bill in the course of its consideration by the Select Committee. That Committee, as I need hardly remind your Lordship, had the great advantage of having amongst its members the Lieutenant-Governor and the Financial Commissioner of the Panjáb. It had also before it the opinions of all the principal revenue officers of the province, and it has sat almost daily for the greater part of each day ever since it was originally named. I hope, therefore, that the Bill will be found to be complete.

"The alterations introduced by the Committee into the draft originally laid before them and printed in the Gazette involve some important questions of principle, and I will examine them in succession in the order in which they stand in the Bill. The first of these modifications consists of the addition of section nine to the original draft. That section is as follows:—

"'The Local Government shall, with the previous sanction of the Governor General in Council, give written instructions to the officer in charge of a settlement, stating the principle on which the revenue in such settlement is to be assessed. No Court of Justice shall be entitled, under any circumstances, to require the production, or shall permit evidence to be given of the contents, of such instructions.'

"The object of this provision is to lay down, in the broadest and plainest language, the principle that the assessment of the land-revenue is a matter of imperial concern and of the very first importance; and that though, for administrative reasons the nature of which is sufficiently obvious, it is necessary to leave the management of it to a very considerable extent in the hands of the Local Governments and of settlement officers appointed by and answerable to them, it is equally necessary that the highest authority in India should decide upon and should prescribe the principle on which the amount of revenue to be taken should be assessed. It would be impertinent in me to insist upon the obvious truth that the utility, and even the security, of the British power in this country is mainly a question of finance, or upon the almost equally obvious truth that the land-revenue is the backbone of our financial system. As far as I can judge, it would appear to be the only branch of the revenue to which we can look for permanent and steady, though it must in the nature of things be a very gradual, increase; and it is certainly the only very important branch of revenue in which our constant efforts to increase the moral and material welfare of the community produce an immediate definite money return. This being so, it would certainly appear that the matter had been left in the hands of isolated officers to a degree which can hardly be regarded as expedient. I have been informed that, some years ago, the then Lieutenant-Governor of the North-West Provinces lowered the land-revenue payable by considerable parts of those provinces from sixty-six per cent. to fifty per cent. of the net produce by a stroke of his pen. It is matter of notoriety that all over Northern India, and more especially in the Panjáb, eager discussion has long been, and still is, in progress, upon the question whether the assessments are too low or too high. I have no right to express, or even to entertain, any decided opinion upon the subject, but of one thing I am very sure. Whatever may be the true principle of assessment, the assessment ought to proceed upon principle, and the highest attainable authority ought to decide what is to be the principle on which the assessment is to proceed. If this is not done, and if security is not taken for it by a deliberate and solemn provision of the legislature, the practical result will be, that every settlement will depend upon the theory which the settlement officer—very probably quite a young and inexperienced person—may happen to hold upon the question of landlord and tenant, the nature of landed property and other kindred topics—topics open to as much discussion, and to as many changes of opinion, as any questions whatever. The object of the Committee in inserting the provision in question in the Bill has been to provide the best security in their power against the evils which might arise, and which had arisen, from allowing individual settlement officers to give such very extensive, and it might be such very mischievous, effect to the views which they might happen to hold upon these subjects.

"The next point on which the draft has been modified is the legal effect of entries in Records of Rights. The Council will remember that I originally proposed that the entries in Records of Rights should become conclusive after five years as to the truth of the matters which they stated, unless they were disputed successfully within that period. This provision, with others, was intended to remedy defects in Regulation VII of 1822, which had disclosed themselves with startling distinctness and with very bad consequences in the controversies which terminated in the enactment of the Panjáb Tenancy Act a little more than three years ago.

"I described Regulation VII of 1822 in introducing this Bill, and I may add to what I then said that it appears to me to have been drawn with singularly little reference to anything beyond the settlements which were then in contemplation. Not only does it fail to say distinctly what is to be the legal effect of entries in the Record of Rights, but it does not provide in any way for the case of a second settlement, or say to what extent the officer in charge of such a settlement is to be bound by the entries of his predecessor, and to what extent he is to be at liberty to re-open questions on which his predecesssor had already made a record. The Bill now before the Council provides for all these matters in the most explicit manner. Its provisions are in substance as follows:—

"Records of Rights are to consist of certain specified documents which are to be prepared, signed and attested in a manner to be prescribed by the Local Government. They are subject to revision by the settlement officer until they receive the final sanction of the Local Government, which may be given, separately, either to the assessment or to the Record of Rights. The Local Government will have the power, by withholding their sanction for a reasonable time—a year or two if it thinks it necessary—to test the degree of accuracy with which a Record of Rights has been prepared; and it will be in its discretion, if it thinks that the work has been negligently or inaccurately done, to have the record revised from time to time, either by the original officer or by another, until a degree of accuracy has been attained which it considers sufficient to warrant sanction. When, however, final sanction has once been given, the Record of Rights will be unalterable. The Deputy Commissioner will be charged with the duty of making, through the Kánungos and Patwáris, a record of all facts which may occur subsequently to the completion of the record—such as sales, deaths, or the judgments of courts—and these yearly papers, as they are called, will supply the next settlement officer with the materials for the amount of revision which he is permitted to make. His power will be as follows:—He may revise the record by making entries in accordance with facts which have happened since the last settlement, or entries to which all the parties interested consent, or which represent the judgments of courts of law. He may also, if the Local Government so directs, make new maps and surveys and correct the entries affected by them, but not so as to affect any person's share or holding or his status. The Record of Rights will thus be binding on subsequent settlement officers, and such proceedings as produced the controversy which led to the Panjáb Tenancy Act will for the future be impossible.

"So far, the Committee have thought it not only safe and desirable, but absolutely necessary, to go, in the direction of making the Record of Rights final and conclusive. I had suggested, as I have already observed, that we should go a step further, and make the entries conclusive evidence of that which they assert after a period of five years. This proposal was most carefully considered

by the Committee, and most of the revenue officers who were consulted upon the Bill expressed their opinions upon it. They were, I may say, unanimously of opinion that such a provision would produce a great deal of injustice; and after very full consideration of the subject and repeated discussions upon it, the Committee determined to adopt the view which is embodied in the Bill as it stands. This view is, that the entries made in the Record of Rights should be presumed to be true, and should thus throw the burden of proof on any person who might be interested in denying them, but that they should not be regarded as conclusive. My individual opinion upon such a subject is obviously unimportant; but looking upon the question merely as a question of evidence, I must say that I was convinced of the wisdom of this modification. The reasons alleged by the various revenue officers in support of their view were shortly as follows:—They said that the people were so inaccurate and unbusiness-like, that they were so anxious to say whatever they supposed themselves to be expected or wished to say, and, above all, that they were so anxious to get rid of the trouble of inquiry and to have done with the settlement officer and his subordinates, that their statements could not be depended upon. To this the settlement officers added, that the lists stating individual rights had in many instances to be made up by subordinate officers, and were verified by the officer in charge of the settlement in a very imperfect manner in the cases in which no dispute arose which had to be judicially determined. These undisputed cases form, of course, the very great numerical majority of the total number of cases recorded. Other considerations besides these must be borne in mind. I do not for a moment depreciate or underrate the value of finality in proceedings of all kinds, and especially in matters like these; but finality is not the one thing needful. It is our English way to be peremptory and decisive. We always like to do a thing and have done with it in all departments of life, and we had rather suffer a good deal of injustice than be exposed to what to us appears the greatest of all inconveniences—delay, suspense and uncertainty. The natives of this country, from all that I have been able to hear, take things of all kinds a great deal more quietly; do not set the same value on time and on decision, and are by no means equally averse to leaving things more or less at a loose end. I do not see why we should not recognize this state of feeling, or why we should try to hurry the people out of their natural pace.

"Apart from this, it must be carefully borne in mind that, whatever may have been the case at the first set of Panjáb settlements, of which I shall have more to say immediately, subsequent Records of Rights have been, and will hereafter be, made rather in the interests of the revenue than in the interests of the revenue-payers. The people are, no doubt, accustomed more or less to the system, and they do not resent—at all events they submit to—an inquiry which has for its result the preparation of a Record of Rights which stands as evidence of the facts recorded. If, however, we were to go further and make the Record of Rights absolutely conclusive as to those rights, we should inflict a great hardship on the people; no less a hardship than that of making the immediate litigation of every possible question which can be raised upon land compulsory, under the penalty of losing every right which is not then asserted. Let us for a moment consider how such a process would operate in England. Suppose that a settlement officer were to be sent into an English county with authority to compile an exact account of every right existing over the land, and suppose, further, that notice were given to every one concerned that the record so framed would be conclusive, the result would be a mass of litigation by which the courts would be choked, though indeed the proposition would be so inconceivably and intolerably unpopular that it is impossible to imagine that it should ever be listened to. I do not see why people in this country should consider it less oppressive than it would be considered in England to be called upon to litigate every claim upon which they ever intended to insist at any time or under any circumstances, simply because, at a particular period, the Government was desirous of revising its revenue arrangements.

"This remark brings me to a point on which I am particularly anxious to avoid any sort of misconception—the relation of this Bill to the Panjáb Tenancy Act. The enactments of which I have been describing the effect are capable of being represented as jarring with that Act, and representing a different line of policy. Indeed one of the sections of the present Act expressly modifies section two of the Panjáb Tenancy Act, so as to make its operation retrospective only. I am very anxious to make it as clear as I can that the difference between the two measures is apparent only, and not real; that the present Bill in no way conflicts with the Panjáb Tenancy Act, but on the contrary confirms and carries out its policy, though it does incidentally supersede one of its provisions, by the manner in which it disposes of the whole subject at part of which that provision incidentally glances. In order to explain this, it will be necessary to say a few words on the scope of the Panjáb Tenancy Act, not with any controversial object, but merely in order to show distinctly how these two measures are related to each other.

"It is impossible to read either the Panjáb Tenancy Act or the debates upon it and not to see that it was a measure intended to meet and dispose of a pressing practical question which had arisen in consequence of certain proceedings of the settlement officers, and not a comprehensive piece of legislation upon settlement law. Moreover, it was, and was admitted to be, a compromise between two opposite views of the subject. In a few words, the matter stood thus. In the first Panjáb settlements, which on an average had preceded the Panjáb Tenancy Act by about sixteen or seventeen years, a very large class of persons had been recorded as being tenants with a right of occupancy. At the settlements which immediately preceded the passing of the Act, the officer in charge of the settlement, acting under Regulation VII of 1822, set aside the old settlement records altogether; re-opened the question whether the tenants recorded as having a right of occupancy were or were not entitled to such rights; and decided that large numbers of them—many thousands, Sir Henry Maine said as many, I think, as 40,000—were mere tenants-at-will. Two views were taken of this proceeding. On the one side, it was considered that this was a wholesale destruction of rights of long standing, which had been created under the guarantee of British Courts of Justice, at a time when there was hardly anything in the whole country which deserved the name of a legal right, proprietary or otherwise. On the other side it was considered that the original settlement records had been negligently made; that in particular they virtually set aside the rights of a class of superior proprietors; rights which had been forcibly held in abeyance during the Síkh rule, but which were still remembered and valued, and which, under our system, had again become valuable and ought to have been protected.

"These were the opposite views, each of which was very vigorously expressed in the debate which took place here three years ago. The Act was a compromise between them. On the one hand it defined, with a precision never attempted before, the relations of landlord and tenant and the rights of occupancy tenants; and on the other hand it contained a provision in Section two, which declared that, as to certain matters connected with that relation, the entries in settlement records should be regarded as agreements. It did not say this quite in so many words, but this I think is the clear effect and meaning of the section in question. Whether it was intended to be prospective as well as retrospective is perhaps open to question. It was at all events intended to be retrospective; and the effect of it, therefore, was to confer a character of conclusiveness on a very great part, at all events, of the entries made in the different Records of Rights then in existence. Whatever may have been the legal purport of the actual words employed, it does not admit of any doubt whatever that the measure was framed with a view to existing facts; that the principal inten-

tion of it was to put an end to what was regarded as an extremely serious practical question. The general subject of the effect which ought to be given to Records of Rights in general was not at that time under the consideration of the Council as it is now, and the result is, that the expressions used by the hon'ble members who took part in the debate, as to the judicial character of Records of Rights, must be construed with reference to the particular Records of Rights of which they were speaking, that is to say, those which were made at the first Panjáb settlements.

"With these remarks I proceed, with your Lordship's permission, to read some observations made by my hon'ble friend and predecessor, Sir Henry Maine, upon this subject; remarks which might possibly be quoted as showing the change of policy of which I have denied the existence. Sir Henry Maine said—

"'At the first settlement of the Panjáb, the officers employed did not merely, as in older Indian settlements, construct a record which was only a *primâ facie* description of the rights therein described. The Panjáb officers were invested with judicial powers, and the Civil Courts were carefully excluded from interference with their decisions, which when given on merits became the decisions of Judges. Of course I do not mean to say that they adjudicated in every case. No court of justice ever adjudicates in more than the minutest fraction of the cases really, though indirectly, affected by its jurisdiction. But it is clear that everybody, landlord or tenant, had an opportunity of coming forward to assert his rights in litigious form, and had power to appeal from decisions which he thought inequitable, and every decision of the Settlement Courts must have indirectly disposed of thousands of cases not actually brought before them. I can scarcely conceive any stronger guarantee given to these rights. A Parliamentary title to property is necessarily somewhat arbitrary; but when a Government sets its courts of justice in motion for the affirmation of rights, bringing them to the very doors of claimants and opponents, it gives a moral guarantee of the highest order.'

"This, it may be argued, is a distinct assertion that an entry in a Record of Rights ought to be regarded as a judicial decision, not to be set aside or contradicted on any subsequent occasion. I do not think that this was Sir Henry Maine's meaning. I think that he meant to say merely that, under the peculiar state of circumstances to which I have already referred, the particular set of entries which had been made in the particular set of papers in question ought to be respected by the legislature as much as if they had been judicial, and deserved to be put by legislation on that footing if legislation was necessary for that purpose. This is obviously quite a different thing from saying that all entries made in all settlement records ought to be regarded as judicial decisions or contracts recorded in an authoritative manner. It was not necessary to Sir Henry Maine's argument to say more than what I have suggested, and I do not believe that he intended to do so. Indeed, I think that what he did say would be open to a good deal of criticism if it was not regarded as being confined strictly to the particular case in question. Upon this, however, I need not enter, as it would be collateral to my main object.

"The justification of Sir Henry Maine's views, thus interpreted, is to be found in the description which was given by himself, and, at the close of the debate, by Lord Lawrence, of the state of things under which the settlements, which immediately succeeded the conquest of the Panjáb, took place. We found the country in a state of chaos. The Síkh Government had so managed its affairs as to render it altogether doubtful whether the notions of legal right and private property existed at all in the country, or had been altogether subverted in it. The first object of our rule was to provide some sort of order, and to revive, if not to create, those elementary ideas which form the necessary basis of anything like a stable or prosperous state of society. The first Panjáb settlements were made with a view to this state of things. They were no doubt intended by their authors to form a sort of Doomsday Book for the Panjáb; to supply what an English lawyer would describe as a root of title. They were meant to settle—and practically they did settle—a vast mass of questions incapable of being settled by any other process than the one adopted. What the rights of the parties were before the first Record of Rights was formed would seem to have been an indeterminate problem, one which might have been solved in a variety of ways, according to the views and policy

of the persons by whom it had to be solved. However this may have been, it was solved in one particular way by the formation of the Record of Rights, and it appears to me obvious that Sir Henry Maine was perfectly right in maintaining that, after that settlement had remained undisturbed and had formed the basis of all property in land throughout the Panjáb for sixteen or seventeen years, it would have been monstrous to permit it to be disturbed. The Panjáb Tenancy Act gave to it such a measure of validity as it appeared on the whole advisable to give, and nothing can be further from the intentions of the Committee in general, or from my own intentions as the member in charge of the Bill, than to interfere in any way whatever with the settlement then made, or to re-open the questions then decided. Our position is simply this: on reviewing the whole subject of settlement law, we do not think that it would be either safe or just to attach to all entries in Records of Rights any greater degree of importance than is assigned to them by the Bill. We do not think that every entry made by every officer whose duty it is to contribute to the preparation of a Record of Rights ought to be treated as a contract for the future; but we do not propose to re-open the questions settled by the Tenancy Act as to the past. It must be remembered that the very object which the authors of that Act, and Sir Henry Maine in particular, had most clearly in view was to give a fixed and permanent character to the rights guaranteed or created by the first settlements. But if we were to permit such rights to be taken away without remedy by an entry in a subsequent settlement, we should considerably diminish their value. Every argument, in fact, which can be used to show that some of the entries at the first settlements ought to be held sacred, is an argument against attaching an excessive artificial importance to entries made at subsequent settlements. Whatever may have been the case twenty-two years ago, rights of property are now in existence without any sort of doubt; their value is universally recognised; the proper means of preserving and vindicating them—resort to Courts of Justice—is universally understood; and to have a universal re-settlement of rights, with compulsory litigation of every conceivable outstanding claim once in every generation, would be as absurd as to go on pulling out the teeth of a grown-up man at intervals of fifteen years, because, when he was fifteen years of age, it was necessary to pull out some of his teeth to make room for the rest.

"I now come to consider that part of the Bill which relates to the sale of lands for arrears of revenue. The Acts which regulate this procedure in the North-West Provinces are long and intricate. When they were passed, the Code of Civil Procedure was not in existence; but the provisions for the sale of land contained in the Code are, with very few exceptions, identical with those of the revenue sale law. In order to avoid needless intricacy in the law, we propose that the process of sale provided in ordinary cases by the Code of Civil Procedure should also be employed in the sale of lands for arrears of land revenue, with certain modifications of detail. In order to avoid the oppressive use of these powers, we propose that no sale should be allowed to take place without the special sanction of the Financial Commissioner. The subject is not one to which much importance can be attached, as sales for revenue are practically unknown in the Panjáb, and will, I hope, continue to be so. As to the method of procedure, there is really very little to choose between the North-West Provinces sale law and the Code of Civil Procedure, and I do not myself see that what little difference there is, is of any particular importance to the defaulter.

"The next point to which I have to refer is section sixty-five, which provides that no Civil Courts shall take cognizance of various matters specified therein, but that they shall be decided by the revenue authorities, amongst whom a regular course of appeal is provided, from the Deputy Commissioner to the Commissioner, and from the Commissioner to the Financial Commissioner. The matters from which the Civil Courts are thus excluded may be described shortly as being all matters connected with the formation of the Records of Rights,

the right of particular persons to be settled with, the collection of the revenue, except in specified cases, and the decision of claims, as against the Government, though not as between individuals, to village offices. The effect of this section will be to avoid what I think must be felt as a great difficulty by every person who tries to understand the revenue system of the North-West Provinces.

"The difficulties of the subject may be summed up in the phrases, 'summary decision,' 'revenue courts,' 'revenue cases.' As far as I can understand the matter—and I am by no means sure that I do understand it—a summary decision is not, properly speaking, a decision at all; a revenue court is not a court, and a revenue case would not be a case, if it were possible to find any state of things to which that vaguest of words does not apply in some sense or other. At all events, this section will make matters quite clear in the Panjáb. There are certain specified matters which are to be disposed of by the revenue officers, and certain others which will be left to the ordinary civil courts or to the settlement officers in their judicial capacity, whilst their judicial powers remain in force. The section to which I have referred specifies distinctly what those matters are. One anomaly which I am told exists in the North-West Provinces will be completely avoided by this method of proceeding. An appeal may be brought from one revenue official to another, till the matter is disposed of by the Board of Revenue. Their decision may then be contested in the civil courts, and the parties may thus go on appealing till they get up to the High Court. There may thus be as many as five or six appeals in one case.

"The last provisions to which I have to refer are sections sixty-six and sixty-seven, which authorize the Local Government to make rules on a variety of matters connected with the working of the Act; give them six months to make such rules, and direct that the rules, when made, shall be annually re-published, arranged in the order of their subject matter, and amended up to date. These provisions relate to those rules only which are to have the force of law.

"Upon these provisions I have several remarks to make. In the first place, I may refer to a criticism made on the draft Bill by an eminent Panjáb revenue official to whom it was referred for opinion. He said that, like Mr. Thomason's *Directions to Settlement Officers*, the Bill might be described as a 'set of affecting common places.' There is a freshness about this which it is impossible not to envy. The old lady who wept over the sweet word Mesopotamia was hard-hearted in comparison to a veteran settlement officer who is affected by a common place about a wájib-ul-arz; but I suppose that the meaning of the criticism (and, by the way, I wish publicly to thank the author of it for several valuable suggestions) was this—The Bill is too general in its terms. It does not enter sufficiently into detail, and it leaves unsettled many matters of great practical importance. I admit the fact, but I deny the inference that the Bill is defective. It is, and it was meant to be, very general in its terms. It does avoid detail. It does leave many important points to be settled by the Local Government. The reason of this is, that the operation of making a settlement is essentially an executive operation. It is not a matter which can be provided for beforehand by legislation in every minute detail. All that the legislature ought to attempt to do is, to lay down in a plain and distinct manner the general outline and frame-work of the operation and the principles on which it is to proceed, leaving the Local Government to fill in such details as experience may show to be necessary. Of course, a person who, by many years of labour, has acquired a technical familiarity with all the minute details of settlement operations may see little importance in such an undertaking; but I think that it is possible to have too much, as well as too little, practical experience. A man may know each particular tree in a plantation so well that he forgets that there is such a thing as a general plan of the whole plantation. To those, however, who come fresh to the subject and wish to learn it; to those who have to superintend the administration of the

system, to see whether it is working well or ill, and to amend its defects; to those who are responsible for its general results, and who have to see, on the one side, that the revenue gets its rights, and on the other, that the people are not oppressed—in other words, to the student, to the Local Government, and to the Legislature—such a scheme, if properly drawn out, may be of the very greatest value. I have no doubt that the excessive confusion into which the whole subject of land-revenue law has from one cause or another been allowed to fall has had very bad practical effects upon the financial and social policy pursued by successive Governments in India. The law has been allowed to contract something of that character of an occult science, known only to experts, which attaches, for instance, to real property law in England.

"The minor legislation on this subject we propose to make over to the Local Government, subject to the provision that a new edition of such of their rules as are to have the force of law shall be published annually, amended up to date. The effect of this will be to prevent the growth of one of those anomalous masses of rules, circulars, explanations and so forth which have hitherto been such blots upon the administration of the land-revenue. I hope your Lordship and the Council will observe that the provision to which I am now referring relates to those rules only which are to have the force of law. Nothing can be further from the intention of the Act than any interference with the ordinary authority of the Local Government over its own officers. This we propose to leave as we find it. Executive instructions will of course continue to be issued on such occasions, and in reference to such subjects as may from time to time appear desirable, and it would, I think, be natural and desirable that these instructions should enter upon a variety of topics which would be out of place in a law.

"I would suggest, for the consideration of my hon'ble friend the Lieutenant-Governor, the importance of causing a new edition of the *Directions to Settlement Officers and Collectors* to be prepared, or, rather, of having those works re-written with a view to the various changes which have taken place since their original publication. Such a work would, in my opinion, be of the highest importance, and I think that an officer of high standing and position might properly be employed upon the work. Good law-books are almost as necessary for the proper administration of the law as good laws. By a good law-book I understand, not one of those shapeless masses of ill-arranged detail which are commonly produced by English lawyers who wish to connect their names with a particular branch of the law; but books showing the principles on which a law is founded; giving that collateral knowledge, the existence of which the legislator assumes; describing the object which the legislator had in view in enacting particular provisions, and the means by which he hoped to attain them. I mean, in short, a work like those books of Mr. Thomasor's to which I have so frequently referred, and not a shapeless mass of cases like somebody's edition of somebody else's edition of *Williams's Notes upon Saunders's Reports*, or a monument of ill directed ingenuity—as worthless intrinsically as a Chinese puzzle—like *Fearne's Contingent Remainders*. It appears to me that such a book as I suggest might be made with perfect propriety to combine an amount of information upon matters connected with the laws and customs of the Panjáb relating to land, and with the past and present administration of that and the adjacent provinces, which would be of the highest and most permanent value, not merely to those who have practically to administer the province, but to every one who is interested in understanding the nature and principles of our rule in India.

"With these observations, my Lord, I have the honour to move that the report of the Committee be taken into consideration."

His Honour THE LIEUTENANT-GOVERNOR wished to say that, regarding the Bill from the point of view of the Local Government, he felt the utmost satisfaction at the prospect of its speedily becoming law. The present was

the first attempt to put the collection of land-revenue on a distinct footing of legality since Regulation VII of 1822. That measure was, as was well known, the result of a tour made by Lord Hastings with Mr. Holt Mackenzie, in the course of which it was discovered that, in consequence of the intricate and obscure nature of our judicature, the numerous small holdings and interests in land could not be satisfactorily adjusted. Consequently, Regulation VII of 1822 was enacted; but it was framed on an imperfect knowledge of the country and people, and had to be supplemented by a large number of detailed instructions from the Local Governments before settlements could be effected by the machinery it provided. One of its main defects was that it gave no judicial powers to the officers engaged in a settlement. Such officers had the power to pass what were called "summary" decisions, which could subsequently be contested in the Civil Courts. When the Panjáb was annexed, judicial powers were conferred on settlement officers, and consequently some of the entries made by settlement officers were no doubt of the same effect as judicial decrees, and the people who did not at that time bring forward their claims for adjudication created a presumption against the validity of their claims, which the Panjáb Tenancy Act had, as regarded several topics, rendered conclusive. But HIS HONOUR was satisfied that it was not desirable for the future to invest mere entries, arrived at without judicial investigations, with any technical effect: they raised a presumption of the truth of what they stated, but they were not conclusive proof of it. HIS HONOUR entirely concurred in the propriety of the principle of assessment being definitely settled on the occasion of each settlement by the Local Government in concert with the Government of India. It was highly desirable that a question so materially affecting imperial finance should be considered and determined by the same authority as was responsible for the financial equilibrium of the country.

As regarded what was sometimes called the "compulsory litigation" occasioned by settlements, HIS HONOUR was satisfied that some such process was inevitable. He remembered how in Oudh it had been originally proposed that no alteration in the record of rights should be recognized, except when made on a judicial decision; but it was found that the parties would not come into Court, and that the record would accordingly be very imperfect; the scheme had in consequence to be abandoned. The Bill, as now amended, would, he hoped, be of great usefulness to the Government of the country, and prove a new starting point for the revenue law of India. He considered that his hon'ble friend (Mr. Stephen) had laid the Panjáb under a deep obligation by the industry and skill with which this difficult measure had been conducted to so satisfactory a conclusion.

The Hon'ble SIR RICHARD TEMPLE said:—"My hon'ble colleague Mr. Stephen, who has just spoken, is quite correct in saying that I have given a very reluctant assent to that portion of this Bill which relates to the record of rights (see sections twenty-one—twenty-four), and I now desire to explain the reasons for the views which I have held and still hold.

"It seems to me that a record of rights at a regular settlement must belong to one or other of three categories,—firstly, it may be a register having no judicial effect whatever, being simply evidence *quantum valeat*, as is the case in the North-West Provinces, under Regulation VII of 1822; or, secondly, it may have absolute judicial effect, being conclusive, conveying a valid title by its entries throughout, not liable to alteration, save for correction of clerical mistakes or errors admitted to be such by the parties concerned, or under peculiar and exceptional circumstances; or, thirdly, it may be a compromise between the above two categories; that is, those entries which depend on a judicial decision shall be final, while all other entries are presumptive evidence only, which will be the effect produced by the present Bill.

"Now, I say that, according to the original intention of the Panjáb Administration, the record of rights was to come under the second of the above

categories, that is to say, that the entries of all sorts were to be valid and conclusive; that the record, as a registration, was to have judicial effect; and that there was to be no alteration subsequently, save for the correction of mistakes acknowledged by all concerned or under extraordinary circumstances.

"In 1849, the Board of Administration declared their view thus (Circular 122 of 30th May)—'The Board are of opinion that disputes regarding rights in the soil can be satisfactorily disposed of in a new country by the settlement officer only * * * * in a settlement office, where less regard is paid to forms, and an arrangement by compromise or arbitration can generally be made.' Later in the same year the Board obtained regular judicial powers for the settlement officers. Then, in 1852, the Board in their first Administration Report thus described the scope and intent of the measure. They said (Panjáb Report, 1850-51, paragraph 293)—

"'One of the first acts of the Board was to obtain the sanction of Government to confine the decision of all questions connected with the landed tenures to the Settlement Courts. * * * * * * No settlement officer ever thinks of limiting his knowledge to formal proceedings placed before him; he is the umpire as well as judge in the question at issue, and it is his duty to search out and ascertain its real merits. He confronts the litigants; he closely and judiciously cross-examines; then places the point at issue, when necessary, before a jury of village elders, and even adjourns to the village and to the disputed spot, in an intricate matter, for the purpose of eliciting the truth. In this way a mass of cases will be disposed of, which, if brought before a more formal tribunal, would occupy the time of many Judges.'

"Then the Board annex a copy of the Jullundur Settlement Report, which they had caused to be 'printed for circulation among the officers in the Panjáb, as it clearly elucidates the system now in force.' Now, that Report termed the record of rights 'judicial registration,' and among other things went on to say—

"'During the latter portion of the settlement, endeavours have been made to dispose of all the minor disputes simultaneously with the preparation of the Khewat and Terij. When the rough copy of the Terij had been drawn up, and sent for attestation to the judicial officer, and the whole village was in attendance, a number of cases were summarily decided by the arbitration of Lumberdars or others on the spot, and in the presence of the people. The result was recorded in a single Roobakaree, setting forth the circumstances of the claim and the manner of its decision, which in the ordinary course of litigation would have been expanded into a lengthy record, have taken up some time, occasioned the summoning of several parties.'

"Full effect was given to these principles in the Judicial Department by the Panjáb Civil Code in 1854. In Section I, Clause 4, it laid down that Civil Courts might not entertain a suit 'for any matter that may have been decided by any authority competent to try it. This clause will apply to decisions passed at a regular settlement.' The commentary attached to the Code explained that this ruling was founded 'on the principle that what has been done by one competent department need not be re-done nor re-considered by another.'

"All this appears to me to show that not only were the judicial decisions of the settlement officers to be respected by all other authorities, but also that the entries generally in the record of rights were to be accepted as valid and conclusive. Besides the wording of the intention which was sufficiently explicit, it followed from the nature of the case that such must be the effect. If only those entries on the record were to have conclusive validity which depended on regular judicial decisions by settlement officers, then many of their most important proceedings would be without such validity. Many of their largest decisions, most deliberately arrived at, and most assuredly intended to have permanent effect, and most formally attested, did, nevertheless, not take the shape of judicial proceedings as ordinarily understood; that is, the judgment might have been made without the filing of plaints and drawing of issues and writing of depositions. For instance, some coparceners in a village community, having been dispossessed during Sikh revolutions, apply to the settlement officer for restitution. The settlement officer arranges with the village community that they shall be restored; but as their holdings had passed into possession of the brotherhood, the restoration would involve some redistribution of

lands and shares throughout the village. After much trouble this is done; the dispossessed sharers are restored; the new arrangements of shares and possession are formally agreed to by all the shareholders and attested by the settlement officer. Now, certainly, it was intended that such a proceeding should be judicially valid. But, strictly speaking, there was no judicial decision on record; it might not have been deemed necessary to record all the claims and counterclaims, and all the disputes which the brotherhood by this large compromise had settled among themselves.

"Again, it was not uncommon for village communities to find that actual holdings of land by the sharers did not quite coincide with the ancestral shares; the land measurements helped in bringing out such discrepancies. The community, after much disputing before the settlement officer, agree to modification of the holdings. This is done and attested. Here also it was certainly intended that the settlement orders should be judicially valid, although there was no judicial decision in the ordinary sense, with plaints and rejoinders and depositions, on record.

"Further, there might be a question between a proprietor and a number of his subordinates as to whether they were occupancy-cultivators or sub-proprietors. The cases being many, but all alike, they begin by trying one case. That ends in the subordinate being declared a sub-proprietor and not an occupancy-cultivator. The proprietor, seeing this, ceases to dispute with the others, and allows them to be entered as sub-proprietors. The settlement officer, aware of all this, contents himself with attesting the proprietor's acknowledgment. It was certainly intended that this record should have judicial validity. Still, in most of the cases, there would be no regular judicial decision on record.

"Countless instances to the same effect might be adduced as to the relations between landlord and tenant; but I forbear from adducing them, because, as regards them, the Panjáb Tenancy Act has expressly given validity to the entries in the record made at settlement.

"Thus I show that the record of rights was clearly intended to have conclusive and judicial validity. In attempting to make such a registration, the Panjáb Administration undertook an arduous task in the interests of the people, in order that landed tenures might, in a country distracted by revolution, be settled on a permanent basis; that finality might be attained, not after a long period of disputes and troubles, but at an early period, that is, as soon as the settlement work could be carried out. The registration was to finally decide all things as they then stood. Whatever disputes might in after times arise were to be decided by the Courts on the basis of that registration. But the registration itself, so far as it went, was to be respected as conclusive. This was a policy, practically excellent and beneficent in design, though difficult of execution. It was partially executed; and, so far, it has contributed to that signal prosperity which distinguishes the Panjáb. Subsequently, events have shown indeed that its full and perfect execution was somewhat beyond our power at the time. But I, for one, maintain that the policy was in itself the best possible, that it ought still to be followed, and that whatever remains undone in respect to its perfect execution might well be done now.

"But, as I shall show presently, the present Bill falls short of that policy, and this is the reason why my assent is so reluctant.

"I must first, however, trace the steps whereby this policy was departed from, until the record of rights wholly lost the status intended for it by the founders of the Panjáb Administration.

"Shortly after the first settlements were completed, many entries in the record of rights were found to need rectification. Wherever disputants tried to re-open matters in any way decided, on consideration, at the settlement, they indeed met with refusal. But it was often found that the people had made mistakes and oversights, regarding which mistakes all parties concerned were

agreed; that errors had sometimes crept into figured abstracts of holdings and shares, which errors nobody denied.

"The occurrence of these errors was much regretted. No pains were spared by the Government of the day in selecting the best officers, both European and Native, for the work. The European officers have since proved their capacity in many other fields besides the Panjáb; the Native officials have since risen to the highest posts accessible to them in the public service. Neither was expense spared; for large and costly establishments were organized. The causes of error, no doubt, consisted in the novelty of the operation, in the unpreparedness of the people, in the extensive character of the amendment and redress needed after the troubles through which the landed tenures had passed. Mr. Stephen quoted incidentally passages from past debates—though not at all giving it as his own opinion—which stated, among other things, that the settlements had been negligently made, and that the attestations had been imperfectly carried out. I say, however, without the least disrespect to my hon'ble friend, who does not at all say that he believes these statements, that these expressions are wholly absurd and only show to what lengths people will sometimes proceed when speaking in the heat of discussions. The settlements were never negligently made; on the contrary, neither ability, nor labour, nor expense was stinted. The absurdity of the charge of negligence will be patent on the barest mention of names. Was, for instance, Mr. Prinsep, one of the officers engaged, ever negligent? Never; his high character for unremitting and assiduous thoughtfulness forbids the supposition. Were our hon'ble colleagues sitting here today, the Lieutenant-Governor, Mr. Davies, and the Financial Commissioner, Mr. Egerton—both among the officers engaged in these first settlements—ever negligent? The mere asking of the question, regarding such eminent persons, supplies the negative. I might easily extend the list of distinguished names, but forbear to trespass on the time of the Council. As for the attestations being imperfect, I have to say that in those villages of which I have cognizance, the attestations were made most carefully, man by man, holding by holding, by firstrate Native officials of judicial status; often there was re-attestation, by way of check, by an European officer. I have myself re-attested the records in many villages. No doubt the same precautions were taken in other settlements. Still, unfortunately, errors in detail became afterwards apparent.

"In such cases rectification became desirable, and accordingly instructions were issued in October 1856, see Circular No. 55. Shortly afterwards it was found that the wording of these instructions was too broad and general and might be construed to comprise more than was intended, and to admit of matters once settled at the settlement being afterwards re-opened. This tendency was, however, checked. For in 1858 (Circular No. 89) it was ordered that no alteration was to be made in the record without the express sanction of the Commissioner, and a procedure was laid down whereby the district authorities were to proceed before making any such reference to the Commissioner. It was reiterated that under no circumstances was a regular judicial decision passed at settlement to be interfered with. Thus the entries in the record, even though unsupported by judicial decision, were protected from alteration save with the Commissioner's sanction. Now the Commissioner had from the first been the appellate authority in all settlement affairs. He might on appeal, or other reference, have altered anything in the record, though by 1858 the period within which such appeal might be made had, in most cases, past. The effect of the order of 1858 was in some respects little or nothing more than the extending of the period of appeal. Thus the entries in the settlement record remained valid and conclusive, save in those cases where, on special reference, the appellate authority in settlement affairs might otherwise direct. Thus the original policy of the Panjáb Administration was really maintained and so continued till 1860.

"In 1860 a virtual change was made (Circular XXXIII of that year); the district officers were empowered to take up claims to rectification of record.

One category of cases open to rectification was thus described in perhaps somewhat remarkable language—

"'The second class of cases will refer to omission of right not thought of or wilfully left out at settlement.'

"Now, really, these words appear to me to afford scope for the re-opening of matters deliberately and intentionally settled at the settlement, and to trench on the principle of the registration having been valid and conclusive. The wedge was introduced for the invalidation of the authority of the record. In justice to that circular, however, I must note that it set forth that 'changes should be made only on the clearest proof of error, within a fixed period and under competent guarantee and check.' Further, if the district officer thought an alteration desirable, he was first to make a summary enquiry, then to obtain sanction of the Commissioner to try the case regularly. Also I should clearly infer that, until an entry was altered with these formalities, it remained valid and conclusive. On the whole, I should say that the original authority of the record, though deviated from, was not abandoned.

"The author of this circular was Mr. Robert Cust, an old friend, for whom I entertain respect and admiration; and I naturally look to his other writings in order to understand his views. At page 82 of his Manual published in 1866, he adopts, for the record of rights in the Panjáb, the very definition in force in older provinces where the record is not valid nor conclusive, and is nothing more than evidence. It is in this passage described to be 'a basis of information regarding the precise subject of litigation,' as 'not to be taken as grounds for the decision of suits respecting land.' He then goes on to say—

"'This guarantee to the correctness and stability of the record is entirely wanting in the Panjáb, where vesting the settlement officers with powers of Civil Court, and the reservation of all decisions regarding land to the Revenue Courts, has greatly impaired the stability of landed titles.'

"Further on (page 119), he considers that Regulation VII of 1822 was in force in the Panjáb (though whether it was really in force became soon a moot point), and he recognises fully that this Regulation authorized indefinite revision of the record from time to time and the re-opening of questions as might seem proper to the authority of the day.

"Now, this view may or may not be correct, and I, for one, dissent from it. But at all events it is in direct variance with the views of 1849, of 1852, of 1854, of 1858, which I have been citing today. I think that the variation is to be regretted, and shows the necessity of legislation in order to preserve stability of purpose, evenness of course, and uniformity of design in Non-Regulation Provinces.

"And further, whatever might have been the intent of these orders, I believe that they did in effect contribute to what shortly afterwards happened, when a very extensive revision was attempted of matters relating to landlord and tenant, which certainly had been intentionally decided at the settlement. That particular attempt at revision was, however, ultimately disapproved and stopped by the Government and the Legislature of India.

"After that came (the late) Mr. A. A. Roberts. I turn to his Minute at page 516 of the volume on tenant-right. He evidently considers that the whole record is open to revision from time to time, and so far he affirms the variation which had occurred. This was in 1868.

"Meanwhile, in 1865, the Panjáb Courts' Act was passed, which confirmed the power of settlement officers to regularly try and decide contested suits and nothing more. This, of course, must have precluded the notion of conclusive validity attaching to any entry in the record, not based on a regular decree.

"In 1868, the Chief Court of the Panjáb, writing about revised entries in the records, considered them to be 'nothing more than a superior description of registration,' and 'nothing more than revised records affording evidence, but not conclusive proof, of the title set forth.'

"I infer that the Court would not have attributed any different or higher character to the original entries in the record. Though I should regret that such views were entertained as to the want of authority in the record of rights, yet I could not be surprised at the doctrine as laid down by the Court after all that had occurred.

"Thus, as I conceive, the original declaration and intentions of the Panjáb Administration were lost sight of, the authority of the record of rights was lowered, and the record in the Panjáb reduced to the inferior status accorded to the record in the North-Western Provinces.

"To some extent (and as I think beneficially) the authority of the record was restored by the Panjáb Tenancy Act passed in October 1868 in respect to one important division, namely, the relation of landlord and tenant. By that enactment an entry in the settlement records was (except under certain specified contingencies) to constitute a title to occupancy right; also entries when duly attested were to constitute, legally, agreements, and to have the force of contracts. In all this there breathed the very spirit of the original Panjáb policy. Further, the Circular XXXIII of 1860, which opened the door to revision more widely than before, and which had acquired the force of law, was repealed by this Act.

"I certainly think that further legislation is now required to declare whether the record is or is not to be valid and conclusive; or if it is not to be wholly valid, then how far it is to be valid. If not, we shall have the authorities in one decade of years declaring one thing, and the authorities in the next decade declaring another. The Bill today before the Council does supply indeed the requisite definition, and so far I support it, although the definition is not all that I could desire.

"In regard to change of opinion in these matters, I will quote the passage from Sir H. S. Maine's speech (in October 1868) already alluded to today. It runs thus:—

"'The land in India is the foundation of society, and it is asserted that every ten or fifteen years a number of gentlemen may go in and reconstruct society ..... There is not the smallest security for the principles on which such re-adjustment would take place ..... if these pretensions be allowed, and if the whirligig of Indian opinion goes round as rapidly as it has done in my time.'

"Again,

"'There is this further element of suspicion; of course, the word is not meant in any injurious sense. The old settlement reflected the ideas of property and tenant-right, which were then all but universal in India, and which nobody of much credit desired. .....The present proposals on the other hand fall in with the views which have recently become prevalent, and which have the support of great ..... interests in Lower Bengal.'

"Again, in regard to the superior value of original records over revised records, I will quote a remark by Sir H. S. Maine—

"'In the Panjáb, as elsewhere, evidence grows weaker in proportion as it gets older ..... The motives to false testimony had vastly increased. Property in land, which had little or no value before annexation, has now a great and distinct value.'

"As practical legislators we are bound to recollect that a spirit of interference might easily actuate (I do not say that it does always actuate) even meritorious officers. The doctrine of finality in a record once made does in some degree preclude action on the part of those who come afterwards. The idea of actively potential authority to be exercised from time to time, without ever lapsing, is attractive often to the ablest minds. Indeed, the higher the zeal, the greater the public spirit of our officers, the firmer their faith in their own power of doing good, the more will the above view impress itself on them.

"I turn now to the Bill before the Council today. In the first place, I acknowledge fully, as just stated by Mr. Stephen, that it upholds and does not at all interfere with the Panjáb Tenancy Act. I am happy to ac-

knowledge this having myself been, under direction of the late Governor General, the mover and defender of that Act.

"As regards the record of rights, in the first draft of the Bill now before us, it was proposed that the judicial decisions at the settlement should be as good as decrees in the Civil Courts; that a record of rights once made should not be liable to revision at any subsequent settlement save to record intermediate alterations by death, transfer and the like, or to make alterations agreed to by parties concerned; and that, with one reservation in favor of absentees, the entries in the record, after a moderate period of limitation, proposed to be five years, should be valid and conclusive.

"This proposal emanating from the Legislative Department was worthy of the breadth of view and the root-and-branch grasp of the subject, which always distinguishes our hon'ble colleague Mr. Stephen. On being referred to the local authorities, however, the proposal was objected to by the settlement officers, on the ground, mainly, that they found they could not in fact make an absolutely reliable record. I understand that they say, in effect, that the people are so careless and apathetic, so ready to say anything however inaccurate in order to be rid of the enquiry, so improvident as to the effect of what they may accept, so inefficient in aiding the investigation, that, despite all efforts, the settlement officers cannot prepare an entirely trustworthy statement of rights. I should, however, consider any such description to be one-sided and incomplete. The people may, no doubt, have these characteristics; but they have opposite and better qualities. Their tenacity, their long memory as to their rights, their regard for ancestral descent, their exact comprehension of coparcenary status, their respect for title to land undiminished by distance of time, by prolonged absence—are proverbial and notorious. Therefore, although they may be in some respects inapt and unfitted to help in forming a good record, yet in other respects they must be peculiarly apt and fitted. Although at first we failed in getting a comparatively perfect record, we may be capable of succeeding now, after more than fifteen years' experience, after availing ourselves of the work done in the first record, and considering that in the meantime the people have advanced so greatly in intelligence and education. I therefore must regard the admission which the settlement authorities now make, to the effect that they cannot make a perfect record, as an unfortunate one, not easily to be understood. I should have thought that they could now make a record virtually almost perfect.

"However, the contrary view has so far carried weight with the Select Committee of this Council that a revised proposal has been adopted. The judicial proceedings of the settlement by arbitration or by formal enquiry will be as good as decrees of Civil Court. The record once made at a regular settlement cannot be revised at subsequent settlements save for insertion of facts which have subsequently occurred,—death, transfer, and the like. The entries in the record shall be presumed to be true until proved to be otherwise: and no alteration can be made save by order of Civil Court. No doubt these provisions which will pass probably into law today do afford important safe-guards to raise the record from the status to which it has of late years descended, and to remedy the defects incidental to the old system established by Regulation VII of 1822. So far I cordially concur. Still, however, an ordinary entry in the record is only to be presumed to be true. It may therefore be disputed in a Civil Court by any party who brings evidence to rebut that presumption. And in this country it is seldom difficult to procure some sort of evidence against even matters which have been carefully settled. Thus I fear that there remains a defect in the Bill as amended by the Select Committee. On the other hand, it is not easy to successfully rebut a presumption established by law, and this much of presumption will do good. We must be thankful even for that.

"*Actual* finality to the record, however, will only be obtainable by a judicial decree. Therefore a settlement officer who wishes his work to stand and to be placed beyond the chances of dispute and the reach of litigation, should instruct claimants of all sorts to file their suits regularly and never to be content with compromises, or settlements, or promises. This will lead to increase of formal litigation at the time of settlement, but the consequence is a necessary one. Or if on a claim being made the parties shall agree, then the settlement officer should advise the parties to enter an agreement so formally and attest it so fully that it shall have in law the force of a contract. Failing all this, there is nothing left to the settlement officer but to surround his record with so many attestations that when hereafter in a Court of Justice the legal presumption of its truth shall be questioned, the said presumption shall be very hard to be rebutted. I earnestly hope that in this respect the settlement officers will be imbued with the same spirit as their predecessors; that they will strive to secure permanency and stability to their work, remembering that a registration of land tenure and title, which is liable to be disputed in the Courts, is an evil to the country. A registration which is not thus liable to be interfered with is a real blessing to the agricultural population.

"My own experience, now extending more or less over many provinces of India, convinces me that such a registration which cannot be interfered with, and which is from its merit worthy of that high status, would be one of the greatest benefits which the British Government could confer on an Indian population. Its due preparation would be worth any trouble or expense within reason. I consider that it was (as is acknowledged) undertaken originally by the Panjáb Government, not so much in the interest of the State as in the interest of the people. If that undertaking be now persevered in, it will still be in the interest of the people and mainly in no other interest. I am not sure whether I rightly apprehend what fell from Mr. Stephen on this point, but it seemed to tend somewhat in a different direction. Be this as it may, however, I wish to say that the valid and conclusive registration is as much needed in the interest of the people now as it ever was, and our State interest in the matter is no stronger now than formerly. The fiscal interest, that is, the collection of the land-revenue, does not absolutely depend on such registration. That revenue is fixed on the land which is hypothecated for the payment. The collection is made from the actual possessor. Whatever other rightful claimant there may be, if there be an arrear of revenue due from a parcel of land, that parcel can be sold in recovery (however rarely such process be resorted to) whatever be the questions as to title.

"I cannot see any injustice (whatever may be thought to the contrary) in virtually compelling men to register their titles, on the understanding that the registration is to be valid and conclusive thereafter. A rightful possessor is not hurt thereby; on the contrary, he is benefitted, for his right is by the registration placed beyond the possibility of doubt or question. If a rightful claimant obtains hereby an opportunity of coming by his own again, that is well. Perhaps a possessor who has not right may have to give way to one who has; but here again there is not harm but good. I apply these remarks only to the Panjáb, the province under discussion. Mr. Stephen seems to me to argue to the contrary, relying on English analogy. Well, I will not try to follow him there. But I have understood that England perhaps does not afford the fittest example in this respect, and that in some other countries of Europe the principle of registration is more advanced.

"I have only one remark to add which is this—Mr. Stephen has justly adverted to the section of the Bill which provides that the Local Government shall in the settlement of each district obtain the sanction of the Government of India to the particular principle on which the land-tax is to be assessed. This principle will vary in different parts of the country. The necessity for the Local Government to obtain such sanction has not before been prescribed by any enactment. But in regard to the importance of the land-tax to the

exchequer, it is well to insert a provision in the law. It is not, however, to be supposed that the Government of India does not otherwise possess, or has not claimed, the power of executive interference in this important matter. Unquestionably we can sanction, or modify, or disallow, and we are always well aware of what is being done by the Local Governments; indeed, the main principles on which the land-tax is fixed are usually notorious, even though specific sanction may not have been always obtained, and although the management of the land-revenue is the chiefest of those points wherein the Government of India justly relies on the vigilance and knowledge of the Local Governments. Mr. Stephen no doubt correctly alludes to an instance wherein the Local Government modified the principle without obtaining specific sanction of the Government of India: still that proceeding must at the time have been well known to the Government of India as to everyone else; and had any objection been seen, there might have been interference; as there was not, we must presume that the proceeding was virtually allowed."

The Hon'ble MR. COCKERELL said:—"I wish to express my entire concurrence in the anticipation of His Honour the Lieutenant-Governor of the Panjáb, that this Bill is destined to mark a new starting point in revenue-settlement operations, not merely in the Panjáb, to which the measure is directly limited, but throughout the whole of India. The *general* importance of the Bill is the more marked, inasmuch as we are, I trust, on the eve of consolidating the entire Bengal Regulations relating to land-revenue; and although this Bill does not purport to effect anything like an actual re-enactment of those Regulations for application to the Panjáb, it may be said to contain an adaptation of their more important general provisions to the present state of things in that province, and to be consequently fit to take the place of the Regulations where the latter are in force. I know that, in some quarters, it is accounted little less than rank heresy to suggest that there is anything obscure in the historically great and time-honoured Regulation VII of 1822, or that the style of that enactment is susceptible of improvement. Nevertheless, I venture to express the opinion, that this Bill for the first time sets forth the procedure for the settlement of the land-revenue in a clear and intelligible shape, and that, when its provisions come to be viewed and considered side by side with the Regulations, they will be generally admitted to be a desirable substitute for the latter.

"I feel considerable doubt as to the correctness of the conclusions expressed by my hon'ble and learned friend, the mover of this Bill, in regard to the provision of section two of the Panjáb Tenancy Act. My hon'ble and learned friend assumes, if I understand him rightly, that that provision was intended only to apply to the records of former settlements. I should say that the contrary is to be inferred from the context of the Act. For, whilst the provisions in regard to occupancy rights are distinctly limited to the records of settlements made before the passing of the Act, no such reservation is made in regard to the provisions of section two; moreover, rights of occupancy are expressly excluded from the category of matters recorded at the time of settlement, which, under section two, were to have the force of agreements concluded between the parties affected by them.

"I at least always understood these provisions of section two of the Tenancy Act to have no limit as to their application to settlement proceedings, and strongly objecting to the affirmation by them of what I conceived to be a monstrously inequitable proposition, I moved their omission when the provisions of that Act were under discussion, and I have heard with no small satisfaction today those expressions of my hon'ble and learned friend on this subject which seem to justify the course which I then took.

"However the provisions of section two of the Tenancy Act may be construed, I need hardly add that I entirely acquiesce in the limitation placed upon them by section thirteen of this Bill.

"The hon'ble and learned mover, in referring to the provisions of the Code of Civil Procedure in regard to the sale of land as the latest conclusion of the legislature on this subject, apparently overlooked the later enactment Act XI of 1859, under which sales of land for arrears of revenue in Bengal Proper where, probably, greater experience of what is needed in such cases has been acquired than elsewhere, are conducted. I have learned from the discussions which took place in Committee in regard to this subject that recourse to sales of land for the recovery of arrears of revenue in the Panjáb is almost unknown. As regards, therefore, the question of the best form of procedure to be adopted in this Bill, the point is of little practical importance."

The Hon'ble MR. EGERTON said that it would be unnecessary for him to detain the Council by any minute criticism of the Bill. The measure, as now before the Council, had his hearty concurrence. As to the provisions of section 9 there could, he thought, be no doubt as to the policy of putting a matter of such vital importance on the clearest footing. The land-revenue was the mainstay of the income of the country. This section would relieve assessing officers from a very serious responsibility, and would allow of the principle of assessment being varied in different parts of the country; it was most important that variations of this sort should be possible, as no one uniform rule could be devised which would be equally suitable for districts, the conditions of which were as widely different as those of many of the districts in the Panjáb. What was called "the half assets principle" was extended to the Panjáb in a very informal manner: it was first announced in an order referring, not to the whole province, but to certain resumed muáfís, and was communicated to the settlement officer by the Financial Commissioner by letter, without any formal publication. This principle had been adopted in the Panjáb, simply because it was in force in the North-West, and it was in many respects not well adapted to the Panjáb. The effect of the present provision would be, that the principle of the assessment would, in the case of each settlement, be determined by the Local Government in concert with the Supreme Government, and that definite instructions would be given to the settlement officer as to the principles on which his assessment should be grounded.

As to the force to be given to entries in the record of rights, it would be dangerous, in MR. EGERTON's opinion, to allow the entries any other effect than that provided by the amended Bill. His hon'ble friend, Sir Richard Temple, considered that, in the old settlements, the Government had intended to give a conclusive effect to the entries, and that the entries had been made with sufficient care to allow of this being safely done; but MR. EGERTON was sure that, whatever might have been the care bestowed on the compilation of these records of rights, it had not, as a matter of fact, been sufficient to avoid mistakes. The agency was an untrained one; the people strange to the subject and not altogether friendly to the making of a record: a record made under such circumstances was under a great disadvantage, and could not fail to have numerous mistakes. Almost all the records of the first settlements in the Panjáb were inaccurate, and, in some instances, so serious was the inaccuracy, that Government had for years withheld its sanction from them, in order to allow of their correction. Even in the new settlements considering the speed with which the records were made, and the large amount of responsibility left to Native subordinates, it was inevitable that there should be mistakes; and if there were mistakes, it was highly undesirable to make the record conclusive, however great might be the advantages of a final adjustment of the rights in land. Finality given to an incorrect record was a far greater evil than the mere absence of finality. With a population such as that of the Panjáb, we could not proceed on the principle that, if a man neglected to get his rights duly recorded, he deserved to lose them: if, indeed, the people had demanded the record, the case would be different; but the record of rights was introduced altogether on the part of Government, without any sort of wish or even understanding on the part of those whose rights were concerned.

Taken as presumptive evidence, these entries were most valuable; and it was open to Government to enjoin such ample formalities, and to hedge every important entry with so many securities, that the presumption raised by it would be practically irresistible; but it was safer, in MR. EGERTON'S opinion, to let the weight to be given to an entry depend on the degree of caution shown to have been bestowed upon it, rather than to attach to it a technical importance, which, though no doubt very convenient, must in frequent instances involve substantial injustice.

The provisions as to sales, in the amended Bill, were, he considered, ample. The sale of land in the Panjáb for arrears of revenue was happily unknown: and if at any time it should become necessary to enforce so undesirable a remedy, the sections of the present Bill would ensure that the law should not be put in action in a rash or oppressive manner.

Finally, the rules which the Local Government was empowered by the Bill to frame would, MR. EGERTON thought, be useful in giving an elasticity to the system, and in enabling the Government to adapt the working of the Act to the circumstances and wants of various districts, and to vary it as occasion might require. On the whole, he was sanguine that the present Act would be found to be a valuable assistance in the administration of the land-revenue of the province.

The Motion was put and agreed to.

The Hon'ble MR. STEPHEN moved the following amendment in clause (*c*) of section 19:—

"For the words

'provided that no such amendment shall conflict with the conditions of clauses (*a*) and (*b*) of this section'

"substitute the words

'but not so as to alter any statement as to the share or holding or status of any person, except in the cases mentioned in clauses (*a*) and (*b*) of this section.'"

The Motion was put and agreed to.

The Hon'ble MR. STEPHEN then moved that the Bill as amended be passed.

The Motion was put and agreed to.

BURMA COURTS' BILL.

The Hon'ble MR. STEPHEN moved for leave to introduce a Bill to regulate the Courts in British Burma. Some re-arrangement of the Courts in British Burma had been found necessary, and it was proposed to take advantage of the present opportunity to deal with the whole subject systematically, as had been already done for other provinces of the empire. If leave were now given, MR. STEPHEN would on a future occasion explain the details of the proposed measure.

The Motion was put and agreed to.

CIVIL COURTS' (OUDH) BILL.

The Hon'ble MR. COCKERELL moved that the Report of the Select Committee on the Bill to consolidate and amend the law relating to the Civil Courts in Oudh be taken into consideration. He said, this Bill, originally designed for the consolidation of the several enactments comprising the law relative to the Civil Courts in Oudh, had developed into a scheme for effecting some very important modifications of the constitution and jurisdiction of those Courts.

As regards their cognizance of original suits, the proposed change was one rather of form than of substance; for, although the existing law provided for

eight grades of Courts, there were in fact only six classes of Courts of different jurisdiction, *e. g.* (1) Tahsíldárs' Courts, with jurisdiction up to rupees 100; (2) and (3) Assistant or Extra Assistant Commissioners' Courts of the second and first classes, with jurisdiction up to rupees 500 and rupees 5,000 respectively; (4) Deputy Commissioners' Courts, with unlimited jurisdiction; (5) Commissioners' Courts, and (6) the Court of the Judicial Commissioner. The number of the Courts of the three highest grades remained fixed; but the number of the Courts of the Assistant Commissioners of the first and second classes varied according to the degree of competency and experience in judicial work possessed by the available Assistant Commissioners or Extra Assistant Commissioners in the province for the time being; the several Assistant and Extra Assistant Commissioners being vested with the jurisdiction and powers of Courts of the Assistant Commissioners of the second class or first class, in accordance with their respective qualifications for the exercise of a lower or higher jurisdiction.

The plan of the amended Bill was to treat the Courts of all Assistant Commissioners and Extra Assistant Commissioners as Courts of one grade, whilst, at the same time, power was given to the Chief Commissioner to extend, as occasion might require, the jurisdiction of any of the Judges of such Courts, on the ground of personal qualification, in such a way as to bring the constitution authorized by the law as nearly as possible into accord with the system in force in Oudh at the present time.

In the matter of appellate jurisdiction, very considerable changes were provided for. In the Bill as introduced, the course of appeals was shaped to some extent on the principle of the system which obtained in the Panjáb under Act VII of 1868. A second appeal was to be allowed to the Judicial Commissioner on any ground, whether of law or fact, where the judgment of the Court of first appeal did not absolutely confirm the decree or order of the Court of first instance. But, where the judgments of these two Courts were concurrent, whilst no further appeal would lie on any matter of fact, the special appeal under the conditions of the Civil Procedure Code was to be still open in any case to which those conditions would apply.

But the Select Committee proposed to go a step further in the modification of the appellate system, and to abolish the right of special appeal altogether when the first appellate Court confirmed the decision of the Court of first instance; substituting, for such right of appeal, a power to the lower appellate Court to state a case, where it entertained any doubt in regard to a question of law or usage having the force of law, for the consideration and opinion of the higher appellate Court.

There was nothing new in the principle of this proposed change; it was that which governed the procedure in the disposal of cases cognizable by a Small Cause Court, and although the application of it to the far more important cases to which it would be extended by this Bill was unquestionably a very considerable step in advance, the advance was, MR. COCKERELL felt confident, in the right direction. Indeed, he looked forward to see this change of procedure now about to be experimentally introduced into Oudh very generally adopted at some future period in other parts of the empire.

When introducing this Bill into the Council, he suggested that, as one effect of the proposed changes in the appellate system would be, perhaps, to overburden the Court of the Judicial Commissioner, it would be necessary to consider what means could be devised for strengthening that Court, not only for the disposal of the extra quantity of work that would be thrown upon it, but also in regard to such intricate cases and complex questions as might be expected to come before it occasionally, and on which it might be especially desirable to obtain a decision of greater weight than attached to the opinion of a single officer.

Some provision for such an emergency was the more necessary, in that, up to the time of the abolition of the office of Financial Commissioner and the repeal of Act XXXVII of 1867, the Judicial Commissioner had assistance to fall back upon in any case of perplexity, and that, too, at a time when the pressure of work was not so great as it was likely to become under the operation of this Bill.

It was at first proposed to appoint a Commissioner, as Extra Judicial Commissioner, to undertake the duty which formerly devolved on the Financial Commissioner in such cases under Act XXXVII of 1867, and also to revive the further procedure prescribed by that Act in the matter of references to the High Court of the North-Western Provinces in certain contingencies; and this course found favour with the local authorities.

On mature consideration the Select Committee determined that there would be no special advantage in associating a Commissioner, the subordinate under ordinary circumstances of the Judicial Commissioner, with the latter, for the trial of cases involving points of such difficulty that the Judicial Commissioner, presumably the more competent officer, felt himself unable to decide; and that delay would be avoided and a more practical result attained by the reference of such cases direct to the High Court, in the manner prescribed by Act XXXVII of 1867 as an ultimate measure.

The effect of the provision of the amended Bill, in this matter, was to transfer the appeal in such cases from the Court of the Judicial Commissioner to the High Court of the North-Western Provinces, except that the decision of the latter Court, in respect of the case referred, would be treated in all respects as if it had been passed by the Judicial Commissioner.

For the mere disposal of arrears of ordinary business pending in the Court of the Judicial Commissioner, the Bill provided for the appointment of a Commissioner as an Additional Judicial Commissioner.

There was considerable obscurity in the existing law on the subject of jurisdiction in regard to suits relating to land arising in any district in which a settlement of the land-revenue was in progress. By Act XVI of 1865, all such suits were removed from the cognizance of the ordinary Civil Courts to the 'Revenue Courts,' and the Governor General in Council was empowered to invest any officers with the powers of Courts of first appeal, the final appellate authority being the Financial Commissioner. Now, the remarks of his hon'ble and learned friend (Mr. Stephen) on the subject of Revenue Courts, in connection with the other Bill which had been considered today, were singularly pertinent to the present case; for there were not, and never had been, except for the purposes of the Rent Act (XIX of 1868), any 'Revenue Courts' in Oudh, and it had consequently been left to the Executive to determine what officers should do duty for such Courts, and to assign to them the pecuniary limits of their jurisdiction.

For this state of things, which had no proper legal basis, it was proposed, in section twenty-six of the amended Bill, to substitute a power to the Chief Commissioner, with the sanction of the Governor General in Council, to invest officers engaged in making or controlling settlements with the powers of any Civil Court below that of a Judicial Commissioner, for the trial of suits relating to land in districts under settlement. It was further provided, in case the judicial work thus devolving on the settlement officers should be more than they could dispose of with reasonable dispatch, that the Chief Commissioner should have the power of re-transferring any such suits to the ordinary Civil Courts.

For the purposes of this special jurisdiction in regard to suits relating to land, it was declared that a district should be deemed to remain under settlement until the Governor General in Council should otherwise direct.

We proposed to omit the provisions of the original Bill on the subject of taking oaths or making solemn affirmations on accession to judicial office.

They were introduced as part of the usual furniture of 'Courts' Acts.' It was thought, however, that this practice of taking oaths of office was of the number of those ancient customs which were more honoured in the breach than in the observance, and, in fact, there could be little doubt that, since the enactment of the Penal Code, this attempt to get a sort of artificial security for a public officer's honest discharge of his duty was wholly superfluous.

The other alterations appeared to call for no special observations; they related to matters of detail and had for the most part been suggested by the local authorities. There was one proposal made by them which we had been unable to adopt; we were asked to apply the method of regulating the valuation of suits prescribed by the Court Fees' Act to the determination of jurisdiction under this Bill.

In the first place, this mode of determining jurisdiction had not yet been fixed by law in respect of the Courts of any other provinces; but the chief objection was, that the plan of the Court Fees' Act, though suitable for revenue purposes, could not be reasonably followed in all cases with the object of determining jurisdiction. There were many suits not susceptible of other than a purely arbitrary valuation, and for those, an institution fee of fixed but very moderate amount was prescribed by the Court Fees' Act.

If the regulating principle of that Act was adopted for the determination of jurisdiction under this Bill, how could it operate satisfactorily in such cases?

There might be diversity of practice now, but it could hardly be remedied in the way proposed. An almost unlimited general authority over the proceedings of the lower Courts was assigned to the superior Courts, under which they would be fully competent to regulate the derermination of jurisdiction, and it was better not to attempt to fix by enactment any rule which could not meet all cases.

He (MR. COCKERELL) had only to add that the Chief Commissioner and Judicial Commissioner of Oudh were understood to concur generally in the provisions of the amended Bill.

The Motion was put and agreed to.

The Hon'ble MR. COCKERELL also moved that the Bill as amended be passed.

The Motion was put and agreed to.

The Council adjourned *sine die*.

SIMLA,
The 30th October 1871.

H. S. CUNNINGHAM,
Offg. Secy. to the Council of the Govr. Genl. for making Laws and Regulations.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE AND COMMERCE.

ABSTRACT OF A REPORT BY VETERINARY SURGEON P. MOIR, ROYAL HORSE ARTILLERY, DATED 24TH AUGUST 1871, RELATIVE TO THE NATURE AND CAUSES OF THE UNSOUNDNESS EXISTING AMONG THE YOUNG HORSES BROUGHT FORWABD TO COMPETE FOR PRIZES AT THE RAWUL PINDEE HORSE-FAIR OF APRIL 1871.

The fillies were the soundest classes of horses presented at the fair. The colts of two and four years of age had a low average of soundness. Those aged three years were an unusually good lot.

Out of 114 young horses, comprising the best in the fair, 26 only were thoroughly sound, but the proportion of unsoundness in the total number of horses in the fair was no doubt larger than among those presented for prizes.

And the term unsoundness, as applied to these horses, must be taken in its strict medical and legal acceptation, as in many cases the action and utility of the unsound horses was little or not at all impaired.

The nature of the unsoundness in nearly every case was bonespavin, an osseous deposit on one or both hock-joints, and in some cases partial ossification of the fibrous tissues about the coronets of the hind feet. Other horses were affected with bogspavin or distension of the bursa of the true hock-joint.

From enquiries instituted among the horse breeders in the district, it has been ascertained that the young ones are allowed to roam by their mothers' sides for about six months, after which they are separated and fed upon "bajra" and "moth" (green) in the autumnal months, or upon young green wheat and barley in the spring. The quantity given is usually 1 seer of moth or bajra, $\frac{1}{4}$ seer of goor, and 1 chittack of oil or ghee. This allowance is doubled after the first year, and trebled after the second year; some breeders prefer giving dry corn (ardowah), beginning with 1 seer a day for the first year, 2 seers for the second, and so on; but at the time when the young crops are tender, the more general plan is to let the young foals graze and eat as much as they like. At the age of 18 months the foals are exercised once or twice a week by gentle riding. When two years old they are regularly ridden. For the first year there is no difference in the treatment of colts and fillies. But after that period when the latter are still allowed to roam about, the former are brought under restraint and have some one to look after them in the stables.

This comparative freedom enjoyed by the fillies is cited by Mr. Moir as an obvious reason why as a class they are found to be sounder than the colts. The main cause of unsoundness among the young horses of this country is the system that obtains among the natives of tying them by the heels. It is said that heel-ropes are applied to colts especially after the completion of their first year when they are apt to become impatient of restraint and their natural passions are heated by the system of feeding and the stimulating condiments which it is the native custom to give.

In addition to the injudicious restraint of the heel-ropes the breeders occasionally mount and ride their foals at the age of 18 months. At two years old they are regularly ridden, and in all likelihood with sharp bits which throw the weight of the rider on the loins and hocks of the young horse. With horses reared and treated thus, it is a matter for surprise, not that a majority are spavined, but that any are found with sound hocks.

Another injury often caused by the use of heel-ropes from an early age is a bony enlargement of the coronet, a form of unsoundness not usually serious.

The three chief reasons alleged by Mr. Moir for the prevalence of unsoundness are the practice of securing young colts by heel-ropes, the riding them too early when the bones and ligaments are weak, and the use of sharp bits.

The only practical remedy that occurs to him is the introduction of the operation of castration among the yearlings bred by natives and a dissemination of the knowledge of its *modus operandi*. He was informed by Major Urmston, Deputy Commissioner, that the people were not accustomed to castrate young colts and were afraid of risking life. If liberal prices were bestowed at horse-fairs for castrated horses, as had been done at Rawul Pindee, and if breeders could be instructed in the proper performance of the operation, it was probable that the operation would become more popular. The breeders had no very great prejudice on the point. Colts would then get as much liberty as fillies, and before being fastened with heel-ropes they would have attained an age when the bones were hardened and less liable to suffer from the tension of the ropes.

If influential breeders could be brought to adopt the practice of castration with their young horses, a powerful example and encouragement would be given to minor breeders, and immense good might result.

UNIVERSAL EXHIBITION 1873 IN VIENNA.

PROGRAM.

I. Under the august patronage of His Imperial and Royal Majesty the Emperor, an International Exhibition will be held at Vienna in the year 1873, having for its aim to represent the present state of modern civilisation and the entire sphere of national economy, and to promote its further development and progress.

This Exhibition will take place in buildings specially erected for the purpose in the Imperial Park called the Prater; it will be opened on the 1st of May 1873 and closed on the 31st of October of the same year.

II. The following is the classification adopted for the objects exhibited, separating them into 26 Groups:—

GROUP 1.—MINING, QUARRYING AND METALLURGY.
„ 2.—AGRICULTURE, HORTICULTURE AND FORESTRY.
„ 3.—CHEMICAL INDUSTRY.
„ 4.—ARTICLES OF FOOD AS PRODUCTS OF INDUSTRY.
„ 5.—TEXTILE INDUSTRY AND CLOTHING.
„ 6.—LEATHER AND INDIA-RUBBER INDUSTRY.
„ 7.—METAL INDUSTRY.
„ 8.—WOOD INDUSTRY.
„ 9.—STONE, EARTHENWARE AND GLASS INDUSTRY.
„ 10.—SMALL WARE AND FANCY GOODS.
„ 11.—PAPER INDUSTRY AND STATIONERY.
„ 12.—GRAPHIC ARTS AND INDUSTRIAL DRAWING.
„ 13.—MACHINERY AND MEANS OF TRANSPORT.
„ 14.—PHILOSOPHICAL INSTRUMENTS, SURGICAL INSTRUMENTS.
„ 15.—MUSICAL INSTRUMENTS.

GROUP 16.—THE ART OF WAR.—This Group includes all objects and contrivances belonging to the equipment of the army and the relief of the sick and wounded.

GROUP 17.—THE NAVY.—This group comprehends everything relating to the navigation on the sea, on lakes and rivers, shipbuilding, the fitting out of ships, the construction of harbours and light-houses, life-boats, and salvage.

GROUP 18.—CIVIL ENGINEERING, PUBLIC WORKS AND ARCHITECTURE.—In this group will be exhibited the plans and models of executed or projected works belonging to roads and railways, aqueducts, irrigation, drainage, reservoirs, canal and river embankments, private dwellings and cottages, and public buildings (houses of parliament, theatres, hospitals, bathing-establishments, public wash-houses, etc.), and also methods of lighting, ventilating and warming.

GROUP 19.—THE PRIVATE DWELLING HOUSE, ITS INNER ARRANGEMENT AND DECORATION.

GROUP 20.—THE FARMHOUSE, ITS ARRANGEMENTS, FURNITURE AND UTENSILS.—In these two groups it is expected that the different nations will exhibit their peculiar forms and actual conditions of domestic life.

GROUP 21.—NATIONAL DOMESTIC INDUSTRY.—This group is intended to make known the variety and abundance of valuable designs and forms which the productions of national domestic Industry, such as ornaments, potteries, textures, etc., contain.

GROUP 22.—REPRESENTATION OF THE INFLUENCE OF MUSEUMS OF FINE ARTS APPLIED TO INDUSTRY.—The object of this department is to show the means by aid of which the modern museums of Fine Arts applied to Industry (*viz.*, the South Kensington Museum in London and the similar Museums in Vienna, Berlin, Moscow, etc.) endeavour to improve the public taste and diffuse artistic education.

GROUP 23.—ART APPLIED TO RELIGION.—This group will contain all the products of industry and the works of Fine Arts which are employed in public worship.

GROUP 24.—OBJECTS OF FINE ARTS OF THE PAST, exhibited by amateurs and owners of collections. (*Exposition des amateurs.*)

This group has as its aim to enable the visitor to see an Exhibition of treasures of private collections of works of Fine Arts, which are usually accessible only to a limited few; thus giving students and others engaged in artistic pursuits an opportunity to gain new ideas.

GROUP 25.—FINE ARTS OF THE PRESENT TIME.—This group will contain works of Fine Arts produced since the International Exhibition of London in 1862.

GROUP 26.—Education, Teaching and Instruction.

This group will contain:

(*a*). A representation of all objects and inventions which can assist in the education of a child and contribute to its physical, intellectual and mortal development from its birth to its entrance to school;

(*b*). Educational and school matters from the elementary school upwards to the technical school and the University;

(*c*). The entire system of instruction and culture, so far as it can be brought into view by products of literature, of the public press, societies, public libraries, graphic and statistical records.

III. There will be competitive trials of machinery, apparatus, processes and methods of work of different dates, showing their successive improvements; for example: Sewing machines, weaving machines, telegraphy, photography, etc.; an attempt will thus be made to give an epitome of the history of inventions. In addition to this, an attempt will be made to place side by side the productions of machines and handwork, and to show how in some cases machines have superseded handwork, while in others they have aided and increased its products.

IV. By exhibiting also analogous products of industry, manufactured at different epochs, with their relative prices and with samples and models, it is intended to show the growing power of different industries, their dependence on the changes in taste and their influence upon taste as well as their importance in national economy at different epochs, thus exhibiting the history of industry.

V. To show by a retrospective view the influence of science on the progress and development of manufactures, there will be exhibited the gradual conversion of waste into use, or the increase in the employment of the former, by comparing the waste with the articles manufactured therefrom, and also the intermediate products, so far as these are the result of inventions and discoveries since the first International Exhibition of London in 1851.

VI. A further aim in this Exhibition is to give the history of prices; to exhibit from the chief districts of production the prices of more important articles, going as far back as possible and placed side by side in average periods of five years, and illustrated by samples and specimens.

VII. To show the international exchange of products, a representation of the commerce and trade of the world will be formed. For this purpose samples and specimens of the articles of trade and commerce of all the important harbours and sea-ports are to be exhibited.

On each sample will be marked its origin, its destination, its price and value, the quantity of import and export, etc.; along with these will be shown statistical and graphic tables, the movement of the navigation and commerce of each sea-port during the last ten years.

VIII. The intention just expressed of aiding the study of this Exhibition by the help of statistical and graphical tables, will be carried into effect in all the departments of the Exhibition by showing the industrial progress made by each country since the first International Exhibition of London in 1851, from official records. For example: there will be exhibited tables of the increasing areas of cultivated soil, the annual quantities of agricultural products, the value of the land, the interest on money, the traffic and capital of railways, the increase of population, etc., as they have appeared at each of the periods of subsequent International Exhibitions, *viz.*, Paris 1855, London 1862, Paris 1867.

Thus there will be shown the productive powers of different nations in the respective departments assigned to thier products in the Exhibition Building.

On the other hand all particulars of the different articles to be exhibited, such as: The name of the Exhibitor, the description of the objects, the price (which the Exhibitor is at liberty to attach if he please) may be shown on labels attached to each article.

In the same manner, all other informations of public interest the Exhibitor may wish to have published, such as the history and importance of the establishment, its progressive development, its annual production, may also be written or printed and annexed to the objects exhibited: in contradistinction to former International Exhibitions which confined these informations to the printed catalogue.

IX. For the purpose of rendering this Exhibition especially instructive and educational, it is intended to make comparative trials and experiments on processes new or hitherto little known. The value of objects exhibited will be submitted to practical tests. For example: Experiments will be made regarding the production of wines (application of the Hydro-Extractor, heating of wines, etc.,) trials with machine-tools of every description, application of the electric-light, utilizing of aërostation (captive balloons, etc.), experiments with explosive materials, with steam-ploughs, transmission of power by wire-ropes, locomotives, engines on common roads, steam fire-engines, etc.

Lectures will be given on these subjects in a special lecture-room of the Exhibition, and the international prize-problems issued, as, for example, on the best implements for the cultivation of beet-roots for the fabrication of sugar.

X. Arrangements will be made for a series of temporary International Exhibitions of such articles which, by their nature, do not admit of an exposition of long duration. They will comprise:

Living animals (horses, cattle, sheep, pigs, dogs, cats, fowls, game, fish, etc.)

Poultry, venison, butcher's meat, lard, etc;

Dairy produce; milk, cheese, etc.;

Vegetable produce; fresh fruits, fresh vegetables, flowers, plants, etc.

Living plants injurious to agriculture and forestry.

Dynamometric experiments will be made on the tractive force of animals. Also international races at the time of the Exhibition of thorough-bred horses will take place, and for these races prizes will be awarded.

Representations of all other kinds of sports (regattas, etc.), and also national games and plays will be arranged.

Some of these temporary Exhibitions will give rise to practical experiments and practical discussions on the matters to which they refer. For example: the exhibition of dairy produce will give rise to a series of experiments on the improvements in manufacturing butter and cheese, etc.

To enable the public to appreciate alimentary substances exhibited, refreshment-rooms (tasting pavillions) will be erected, where each exhibitor can sell samples of his products even in the shape of cooked food.

XI. During the Exhibition various international congresses and conferences will be arranged for discussing important matters, to which either the Exhibition itself may give rise, or especially selected as subjects of international discussion.

More especially, there will be international congresses of men of science, teachers and artists, physicians, directors of museums of fine art applied to industry, teachers of drawing, architects, engineers, representatives of chambers of commerce, economists acquainted with the questions relative to banking and insurance, of agriculturists, foresters, mining engineers, etc.

Among questions subject to such discussion will be the following:—

The question of intellectual property, of the improvement of public taste, of the promotion and diffusion of arts of design, on economy of transport, on obtaining the highest efficiency of machines, on the extension and development of forest statics, on reducing the price of food, whether by increased production, better organisation of markets, reformed cookery, or new methods of preserving food; on the nourishment and early rearing of an infant, on early healthful training and gymnastics, on the exertions of our time in regard to the curing

of deformed children, on the education of woman and improvement of her social condition.

XII. The division of space allotted to each foreign commission will be geographical, that is to say, according to countries, in such a manner, that the different territories of production shall appear as nearly as possible in the same order as they are situated naturally in the direction from west to east.

XIII. With reference to such objects which admit of a classification in several of the groups specified in Paragraph II, it is left at the option of the exhibitor to name the group in which he wishes his articles to be placed.

XIV. An international Jury will be appointed to award the prizes. Each exhibitor must declare whether he wishes or not to submit to the judgment of the Jury.

If not, the object exhibited will be ticketed "*Hors concours*" (No competitor).

The awards granted by the Jury will be as follows:—

A. For the Fine Arts the prize will be given in the form of a Medal for Fine Arts.

B. For the other objects exhibited the prizes will be as follows:—

(*a*). Exhibitors in former Universal Exhibitions will receive for the progress they have made since the last Exhibition a Medal for Progress;

(*b*). Exhibitors for the first time taking part in a Universal Exhibition will receive as reward for the merit they have shown in a national, economical or technical point of view the Medal for Merit;

(*c*). Exhibitors whose productions fulfil all the conditions of refined taste, in color or in form, will have the Medal for Taste.

(*d*). There will also be given Diplomas of Merit, similar to the honorable mentions of former Universal Exhibitions.

C. **The assistants and workmen who, according to the statements made by the Exhibitors, have taken a notable part in the production of a rewarded object shall have the Medal for Co-operation.**

D. The merits of individuals or corporations who have promo'ed the education of the people, the development of industry, or the national eco of ', or have specially promoted the intellectual, moral and material welfare of t. in rking classes, shall be rewarded by special Diplomas of Honor.

XV. The detailed arrangements for the organisation of the Exhibition, the composition and operations of the Juries, the system of the Catalogues, reports, etc., will be the object of general and special rules.

Vienna, the 16th of September 1871.

The President of the Imperial Commission:

ARCHDUKE REGNIER.

The Chief Manager:

BARON DE SCHWARZ-SENBORN.

UNIVERSAL EXHIBITION 1873 IN VIENNA.

CLASSIFICATION AND DIVISIONS.

GROUP 1.—MINING, QUARRYING AND METALLURGY.

(*a*). Mineral fuels (coals, shales and mineral oils);
(*b*). Mineral ores and metals;
(*c*). Other minerals (as salt, sulphur, graphite, etc.); not including building-materials; *vide* Group 18;
(*d*). Natural alloys;
(*e*). Drawings and models of objects relating to mining, metallurgy and mineral industry: mining, engineering, surveying and map-making;
(*f*). Geological works and geological maps, etc.;
(*g*). Tools and inventions for mining and metallurgy, for under-ground and surface work;
(*h*). Statistics of production.

GROUP 2.—AGRICULTURE, HORTICULTURE AND FORESTRY.

(*a*). Plants for food and physic (excluding fresh fruits and vegetables, which are to be the subject of temporary exhibitions);
(*b*). Tobacco and other narcotic plants;
(*c*). Vegetable fibre (as cotton, flax, hemp, jute, china-grass, etc.); and other plants of commerce in their raw state;
(*d*). Cocoons of silk-worms;
(*e*). Animal products in a raw state (skins, hides, feathers, bristles, etc.);
(*f*). Wool;
(*g*). Products of forestry (timber, wood for cabinet-work, tanning substances, resin in a raw state, dyeing woods, barks, charcoal tinder);
(*h*). Peat and its products;
(*i*). Manures;
(*k*.) Drawings and models of objects used in agriculture, horticulture and forestry; farm maps;
(*l*). Works of the experimental stations:—Wood-land and forest-doom books, Statics of forests, etc.;
(*m*). Processes and inventions for producing, transporting and storing the above-mentioned products;
(*n*). Plans of gardens, drawings and models of horticultural implements, hot-houses, conservatories, irrigation, etc.;
(*o*). New methods of horticultural cultivation;
(*p*). Statistics of production.
(*Vide* Temporary Exhibitions No. 4).

GROUP 3.—CHEMICAL INDUSTRY.

(*a*). Chemical products for technical and pharmaceutical purposes (acids, salts, chemical preparations of all sorts);
(*b*). Raw substances and products of pharmacy, mineral waters, etc.;
(*c*). Fats and their products (stearine, oil acids, glycerine, soaps, candles and tapers, etc.);
(*d*). Products of dry distillation (as refined petroleum, slate oil, parafine, phenylic acid, benzoine, anilin, etc.);
(*e*). Etherial oils and perfumeries;
(*f*). Matches, etc.;
(*g*). **Dye-stuffs, mineral and organic;**
(*h*). **Resins (washed, dyed or bleached), sealing-wax, varnish, albumin, isinglass, glue, starches, dextrin, etc.;**
(*i*). Contrivances and processes used in chemical production;
(*k*). Statistics of production.

GROUP. 4.—SUBSTANCES OF FOOD AS PRODUCTS OF INDUSTRY.

(*a*). Flour and other farinaceous products; malt and its products;
(*b*). Sugar and its products;
(*c*). Spirits and spirituous liquors, etc.;
(*d*). Wines;
(*e*). Ale, beer, porter, etc.;
(*f*). Vinegars;
(*g*). Preserves and extracts (extracts of meat, portable soup, condensed milk, Erbswurst, preserved vegetables, preserved meat, etc.;
(*h*). Tobacco and similar manufactures;
(*i*). Confectionery, ginger-bread, chocolate, coffee-substitutes, etc.;
(*k*). Processes and inventions for preparing all these articles;
(*l*). Statistics of production.

GROUP 5.—TEXTILE INDUSTRY AND CLOTHING.

(*a*). Washed wool and hair used for textile fabrics, carded wool and worsted, combed wool and woollen fabrics, felt, carpets, blankets, hair tissues, mixed fabrics including shawls;
(*b*). Cotton, cotton substitutes, cotton thread, cotton fabrics and cords;
(*c*). Flax, hemp, jute and other fibres; yarns, threads and fabrics of the same; straw fabrics for bonnets, screens and mats, webs and cords of reed, cane, bast, hair, wire, etc.;
(*d*). Raw silk; spun silk and manufactures of silk, silk-wastes;
(*e*). Small-ware manufactures, gold and silver cloths and embroideries;
(*f*). Lace;
(*g*). Hosiery, milled and unmilled;
(*h*). Finished objects of clothing (clothes, gowns, hats, bonnets, shoes and boots, glo and linen, etc.);

(*i*). Upholstery, carpeting, curtains, bed-furniture, etc.;
(*k*). Artificial flowers and feather ornaments;
(*l*). Processes and inventions used in the production of these manufactures;
(*m*). Statistics of production.

GROUP 6.—LEATHER AND INDIA-RUBBER INDUSTRY.

(*a*). Leather; articles of leather, harness, saddles, trunks and other leather goods, excluding clothing and fancy goods; parchment and gold-beater-skin;
(*b*). Skins and furs;
(*c*). India-rubber and gutta-percha articles; excluding philosophical and mechanical instruments and parts of machinery; waterproof stuffs and cloths;
(*d*). Processes and inventions used in the production of these manufactures;
(*e*). Statistics of production.

GROUP 7.—METAL INDUSTRY.

(*a*). Goldsmiths' and silversmiths' work and jewellery, etc;
(*b*). Iron and steel wares, excluding machinery, building materials, philosophical and musical instruments;
(*c*). Manufactures from other metals and alloys;
(*d*). Weapons of every description except military arms;
(*e*). Processes and inventions used in the production of these manufactures;
(*f*). Statistics of production.

GROUP 8.—WOOD INDUSTRY.

(*a*). Cabinet-work (inlaid floors, windows, doors, etc.);
(*b*). Joiners-work;
(*c*). Cleft wood-work (casks, shingles, sieves, etc.);
(*d*). Small staves and their products, matches, etc.;
(*e*). Veneers and marqueteries;
(*f*). Cut and turned wood;
(*g*). Chisel-work and carved-work;
(*h*). Cork manufactures;
(*i*). Basket-work;
(*k*). Wood-work painted, stained and gilt;
(*l*). Processes and inventions used in the production of these manufactures;
(*m*). Statistics of manufactures.

GROUP 9.—STONE, EARTHENWARE AND GLASS INDUSTRY.

(*a*). Stones, natural and artificial; slate and cement works (natural and imitated stones and marbles, paving stones and floor tiles, ornaments and decorations, pipes, grinding stones, etc.);
(*b*). Earthenware (pipes, cooking vessels, stoves, plastic reproductions, terra-cottas, etc.);
(*c*). Glass manufactures (glass for household use and fancy purposes, imitation gems and pearls unset, etc.);
(*d*). Processes and manufactures used in the production of the above articles;
(*e*). Statistics of production.

GROUP 10.—SMALL-WARE AND FANCY GOODS.

(*a*). Manufactures of ivory, meerschaum, tortoise-shell, mother-of-pearl, whalebone, wax-wares, japanned goods;
(*b*). Fancy goods of leather, bronze, etc.;
(*c*). Umbrellas, parasols, fans, canes, whips, etc.;
(*d*). Combs and brushes;
(*e*). Toys;
(*f*). Processes and inventions used in the production of manufactures;
(*g*). Statistics of production.

GROUP 11.—PAPER INDUSTRY AND STATIONERY.

(*a*). Paper pulp, paper and paste-board;
(*b*). Colored papers, paper hangings, tapestry, playing-cards, etc.;
(*c*). Papier-mâchè goods, card and mill-board;
(*d*). Articles for writing, drawing and painting;
(*e*). Book-binding and similar work;
(*f*). Processes and manufactures used in the production of the above manufactures;
(*g*). Statistics of production.

GROUP 12.—GRAPHIC ARTS AND INDUSTRIAL DRAWING.

(*a*). Book-printing;
(*b*). Xylography;
(*c*). Copper-plate and steel-printing;
(*d*). Lithography and chromo-lithography;
(*e*). Photography;
(*f*). Engraving and guilloche work;
(*g*). Pattern-drawing and drawing for decoration;
(*h*). Tools and apparatus;
(*i*). Statistics of production.

GROUP 13.—MACHINERY AND MEANS OF TRANSPORT.

(*a*). Prime-movers (steam-generators, steam-engines, water-wheels, turbines, pressure-engines, air, wind, and electro-magnetic engines, gas machines);
(*b*). Machines for transmitting power (shafts, wheels, pulleys, cords-bands, etc.);
(*c*). Machinery for working special kinds of material (machines for mining, metallurgy, metal-work and wood-work; machines for spinning, weaving, knitting, sewing and embroidering; machines for fulling, cleaning, shearing, dyeing; machines for bleaching, leather-dressing, etc., machines for paper manufactures and book-binding, for type founding, printing, lithography, copper-plate printing, color-printing, etc.; machines and apparatus for sugar-making, oil-manufacture, breweries, distilleries, stearine soap, candles, starch, ice-making, match-making, cornmills and agricultural machinery and apparatus);
(*d*). Other machinery not belonging to the above-mentioned (blast-engines, fire-engines, pumps, ventilators, etc.);
(*e*). Elements and parts of machinery;
(*f*). Railway machinery (locomotives, tenders, railway velocipedes and parts of them, railway carriages and parts composing them, special machinery and apparatus for railway-workshops and railway-contrivances; for making and maintaining railway-plant; snow-ploughs, etc.);
(*g*). Steam gauges, dynamometers, tradiometers, etc.;
(*h*). All sorts of vehicles not connected with rail;
(*i*). Statistics of production.

GROUP 14.—PHILOSOPHICAL, SURGICAL INSTRUMENTS.

(*a*). Mathematical, astronomical, physical and chemical instruments (instruments for measuring, weighing and dividing; for optical and electric telegraphy);
(*b*). Surgical instruments and apparatus (artificial limbs, teeth, etc.);
(*c*). Horological instruments, clocks, watches and their parts (chronoscopes, chronographs, electric clocks);
(*d*). Statistics of production.

GROUP 15.—MUSICAL INSTRUMENTS.

(*a*). Musical instruments;
(*b*). Parts of them (strings, bows, moulding boards, membranes, keys, pipes, etc.);
(*c*). Sound carrying apparatus (speaking pipes, signal whistles, etc.);
(*d*). Bells, chime of bells;
(*e*). Statistics of production.

(*Vide* Additional Exhibition No. 3.)

GROUP 16.—THE ART OF WAR.

(*a*). Organisation and recruiting of armies;
(*b*). Equipment of troops, accoutrements and armour;
(*c*). Artillery;
(*d*). Military engineering;
(*e*). Sanitary contrivances;
(*f*). Military education, training and instruction;
(*g*). Cartography and historiography.

GROUP 17.—THE NAVY.

(*a*). Materials for naval architecture;
(*b*). Models and drawings of boats and ships for inland-lake and river navigation; sea-going ships, coasting vessels, merchant-ships and ships of war, stores and fittings for equipment, outfit and armament of ships;
(*c*). Tools and apparatus used in ship-building;
(*d*). Clothing, outfit and accommodations for crews;

(*e*). Land and water works for navigation (models and drawings of docks, harbours, sluices, floating docks, floating batteries and coast defences);
(*f*). Hydrography, charts, meteorological instruments; education of seamen and officers.

GROUP 18.—CIVIL ENGINEERING, PUBLIC WORKS AND ARCHITECTURE.

(*a*). Building materials; processes and apparatus for quarrying, brick-making; iron-girder work; preparation and preservation of wood; artificial stone, terra-cotta work, etc.;
(*b*). Materials and appliances for foundations (pile-drivers, screw-piles, cofferdams, caissons, pneumatic and diving apparatus);
(*c*). Contrivances and tools for earth-works (excavators, dredging-machines, apparatus for raising, carrying and transporting earth and materials);
(*d*). Materials and apparatus used for roads and railways (road rollers; railway superstructure, switches, crossings, turn-tables, traversing-tables, inclined planes, lifts; pneumatic and other modes of propelling; water stations and their apparatus, railway station buildings of all kinds and systems of railway-signals);
(*e*). Hydraulic engineering works, excluding sea-works (river-works, canal-works, dikes, locks, dams, etc.);
(*f*). Models and plans of viaducts, bridges and aqueducts, etc.:
(*g*). Plans, models and drawings of public buildings, dwelling-houses, barracks, penitentiaries, prisons and hospitals, schools and theatres, laborers' cottages; apparatus for lifting and moving heavy weights in buildings, as lifts, etc.; plans and models of cheap dwelling-houses; tools and implements of artisan-builders;
(*h*). Apparatus and inventions for health, comfort and convenience in buildings (for lighting, water-supply, drainage; water closets, lightning-conductors, etc.);
(*i*). Agricultural engineering; plans for culture, fencing, draining; farm buildings; buildings for cattle-breeding; stores, stables, manure-tanks, etc.;
(*k*). Industrial buildings; spinning-mills, weaving-mills, grinding-mills; distilleries, breweries, sugar-manufactories; warehouses, sawmills and docks, etc.

GROUP 19.—THE PRIVATE DWELLING-HOUSE, ITS INNER ARRANGEMENT AND DECORATION.

(*a*). Models, drawings and finished buildings representing dwelling-houses of civilized nations;
(*b*). Drawings, models and examples of thoroughly furnished apartments.

GROUP 20.—THE FARM-HOUSE, ITS ARRANGEMENTS, FURNITURE AND UTENSILS.

(*a*). Finished buildings, models and drawings of farm-houses of the different nations of the world;
(*b*). Drawings, models and examples of peasant rooms, furnished and fitted out with their furniture and apparatus.

GROUP 21.—NATIONAL DOMESTIC INDUSTRY.

(*a*). Pottery and porcelain;
(*b*). Fabrics, tapestry, embroidery, lace and other needle-work;
(*c*). Metal articles and ornaments;
(*d*). Carved-work and utensils.

GROUP 22.—EXHIBITION SHOWING THE ORGANISATION INFLUENCE OF MUSEUMS OF FINE ART APPLIED TO INDUSTRY.

(*a*). The various methods and means by which the different modern Museums (*viz.*: the South Kensington Museum in London and the similar Museums in Vienna, Berlin, Moscow, etc.) endeavour to carry out the improvement of the general taste of the people, and the manner in which they promote the art industry and public instruction of their countries;
(*b*). Exhibition of the objects which have been produced and propagated by those modern Museums.

GROUP 23.—ART APPLIED TO RELIGION.

(*a*). Decoration of churches (wall decoration, stained glass, glass-painting, etc.)
(*b*). Church furniture (altars, organs, pulpits, pews, shrines for enclosing sacred vessels, etc.);
(*c*). Ornaments for altars, pulpits, crucifixes, challices, liburiums, candle-sticks, altar hangings and carpets, pulpit-hangings, etc.;
(*d*). Objects used in baptism and funerals, etc.

GROUP 24.—OBJECTS OF FINE ARTS OF THE PAST, EXHIBITED BY AMATEURS AND OWNERS OF COLLECTIONS (EXPOSITION DES AMATEURS).

(*a*). Paintings of ancient masters;
(*b*). Objects d'art. Bronzes, enamels, miniatures, majolicas, porcelain, faience, etc., etc.

GROUP 25.—FINE ARTS OF THE PRESENT TIME, WORKS PRODUCED SINCE THE SECOND LONDON EXHIBITION OF 1862.

(*a*). Architecture, including models, designs, sketches and surveys of architectural works of the present times;
(*b*). Sculpture, including figures and groups of small sizes; engraving, medals, etc.;
(*c*). Paintings, including miniatures and enamels;
(*d*). Graphic arts, including copper and steel engravings, etching, wood-cuts, etc.

GROUP 26.—EDUCATION, TEACHING AND INSTRUCTION.

(*a*). Education, Exhibition of all the arrangements and contrivances for the better nursing, training and rearing of children; their physical and mental development from the first days of their life up to school-time; their nourishment. Cradles, nurseries, etc. Child gardens (kinder-garten), child-games and amusements, child gymnastics.
(*b*). Teaching. Exhibition of school-houses and school apparatus in models, drawings, and examples. Exhibition of means of instruction. The works and journals of instruction. Description and illustrations of methods of instruction. History and statistics of a school, its organisation and laws;
  (α). Elementary schools. This department will include apparatus for the instruction of the blind, deaf, dumb and idiots;
  (β). Middle schools, comprehending gymnasiums, "Realschulen" or schools wherein exact science and modern languages are taught;
  (δ). Professional and technical colleges;
  (γ). Universities;
(*c*) Instruction in the more limited sense; instruction of adults through literature, the public press, public libraries and educational societies and associations for instruction.

All machinery is contained in Group 13, but nevertheless the machines for working special kinds of material will be examined by the Jury of the professional group to which they may belong, with the assistance also of competent machine builders. It is left to the free will of the Exhibitor to choose the Group in which he wishes his object to be placed, should it be susceptible of being placed in more than one Group.

ADDITIONAL EXHIBITIONS.

1. The history of inventions.
2. The history of industry.
3. Exhibition of musical instruments of Cremona.
4. Exhibition of the use of waste materials and their products.
5. The history of prices.
6. The representation of the commerce and trade of the world.

TEMPORARY EXHIBITIONS.

1. Live animals (horses, cattle, sheep, pigs, dogs, fowls, games, fish, etc.);
2. Butcher's meat, venison, poultry, lard, etc.;
3. Dairy produce;
4. Garden produce (fresh fruits, fresh vegetables, flowers, plants, etc.);
5. Living plants injurious to agriculture and forestry.

For these Exhibitions special instructions will be afterwards published.

Vienna, the 16th of September 1871.

The President of the Imperial Commission:
ARCHDUKE REGNIER.

The General Manager:
BARON DE SCHWARZ-SENBORN.

THE LATE CAPTAIN J. P. BASEVI OF THE SURVEY DEPARTMENT.

GEOGRAPHICAL.
No. 26.

INDIA OFFICE;
London, the 26th October 1871.

To His Excellency the Right Hon'ble the Govr. Genl. of India in Council.

MY LORD,—I have received, with feelings of deep regret, the melancholy news of the death of Captain Basevi, while engaged in the completion of the pendulum observations in the Chang Chemmo Valley, which had already been announced by telegraph; but the details of which I have only received with your Excellency's Despatch dated the 1st of September (No. 12) 1871.

2. I have caused a copy of Major Montgomerie's letter to be forwarded to the President of the Royal Society, and I shall be prepared to consider any proposals which may hereafter be made by your Excellency's Government with regard to the suggestions contained in it; but in the meanwhile I could not allow a mail to leave England without expressing my sense of the great loss which has been sustained by the Public Service and by Science in the death of this accomplished and devoted Officer. The series of observations which Captain Basevi had so nearly completed will form a lasting memorial of his services to Science, while his previous career had already entitled him to rank among the foremost of the distinguished scientific Officers now serving under your Excellency's Government.

I have, &c.,
(Sd.) ARGYLL.

REPORTS ON THE STATE OF THE SEASON AND PROSPECTS OF THE CROPS.

GENERAL REMARKS.—In Madras, Bengal, the North-Western Provinces, Oudh, the Central Provinces, British Burmah, East Berar, Mysore, and Coorg, prospects are, on the whole, favorable, though in Madras much local damage has been caused by storm, and in parts of the Central Provinces rain is wanted for the rubbee crops.

In Bombay the prospects of the grain harvest have somewhat improved, and the effect of this has been to lower prices in the Central Provinces. In Rajpootana timely showers have been of great use. In Central India things seem unchanged. The accounts from the Punjab and West Berar are decidedly unfavorable, the long-continued absence of rain being severely felt.

The prospects of the cotton crop in Khandeish, Nassick, and the Deccan seem to have fallen off. Elsewhere such cotton reports as have been received are favorable.

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
MADRAS	Vizianagram	December 6	*Nil.*	December 7	Harvest begun; health good; market well supplied; slight fall in prices.	The Government of Madras considers the general prospects not unfavorable. In the Northern Circars, the failure of crops is serious in limited localities, but the supply of grains from other sources is abundant, and prices are not excessive: the condition of the people is carefully watched. In the Southern Coast Districts the damage from the storm is serious but local. The inland districts are generally very flourishing. Prices tend upward from a low level.
	Masulipatum	"	0·85	.....	Dry crops being cut, yield below average; wet crops in ear. General condition not unsatisfactory; prices fluctuating.	
	Kurnool	"	*Nil.*	.....	Dry crops generally good; paddy crop withering in two talooks; prices rising.	
	Negapatam	"	4·00	.....	Prospects injured by the late storm; prices rising.	
	Trichinopoly	"	0·74	.....	Crops generally flourishing; some damage by the late storm; harvest below the average; prices have risen slightly.	
	Calicut	" 5	0·21	.....	The heavy rain of last month was injurious to the best lands, but beneficial to the inferior; an average harvest expected; prices are low but rising.	
BOMBAY	Khandeish	December 6	*Nil.* ...	December 7	Cold weather beginning to be felt; grain crops middling; cotton bad.	
	Nassick	"	...	"	Early and late crops middling; cotton bad.	
	Sind	"	...	"	Cotton generally good.	
	Goozerat	"	...	"	Cotton good. Light rain in north. Hail storm has slightly injured exposed crops. Late crops favorable.	
	Deccan	"	...	"	Cotton unfavorable. Late crops withering.	
	Southern Maratha Country	"	...	"	Cotton generally good; early crops fair, late middling.	
BENGAL	Bhaugulpore Division	December 6	...	December 7	Out-turn of rice expected to be good. Cold weather crops flourishing. A little more rain necessary. In Nya Doomka crops not so good as last year.	There has been no rain anywhere, except in the Assam Districts, within the last fortnight. Weather cool and healthy everywhere.
	Patna	"	...	"	Rice harvest commenced and spring crops sown.	
	Rajshahye	"	...	"	All crops flourishing. Rice being reaped.	
	Burdwan	"	...	"	Amun crops excellent, and are being reaped. Winter crops flourishing.	
	Presidency	"	...	"	Rice being reaped, other crops good.	
	Dacca	"	...	"	Prospects of crops excellent.	
	Chittagong	"	...	"	Prospects generally favorable.	

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
BENGAL—*continued*	Cuttack Division	December 6	...	December 7	Paddy nearly reaped, and is above the average, except in some parts of Pooree. Spring crops promising well.	There has been no rain anywhere, except in the Assam Districts, within the last fortnight. Weather cool and healthy everywhere.
	Chota Nagpore „	„	...	„	More rain required for the spring crops.	
	Assam „	„	...	„	Reaping commenced. Rice good, other crops fair. In the Garo and Naga Hills cotton good.	
	Cooch Behar „	„	...	„	Crops good. Rice in Darjeeling Terai has suffered from want of rain.	
N. W. PROVINCES	Meerut	December 6	...	December 7	Prospects of rubbee good; breadth of sowing large; khureef unfavorable.	
	Bareilly	„	...	„	Nothing new.	
	Allahabad	„	...	„	Rubbee prospects good.	
	Benares	„	...	„	Fields being irrigated; rain wanted.	
	Agra	„	...	„	Weather cloudy. Khureef and rubbee as before.	
PUNJAB	Delhi	December 6	...	December 7.	Prospects of rubbee gloomy.	Still no rain, consequently no improvement in agricultural prospects since date of our last report.
	Umballa	„	...	„	Prices do not exhibit much fluctuation.	
	Jullundhur	„	...	„	Rain urgently needed. Baree-Doab Canal flowing. Inundation canal dry.	
	Lahore	„	...	„	Khureef out-turn below average. Rubbee sowings have been on an extensive scale.	
	Mooltan	„	...	„	Crops suffering.	
	Rawul Pindee	„	...	„	Khureef nearly reaped. Out-turn three-fifths of an average one. Rubbee sowings commenced on irrigated lands.	
	Peshawur	„	...	„		
OUDH	Lucknow	December 6	...	December 7	.....	Weather clear throughout the province. The khureef crops almost reaped; the rubbee crops progressing favorably; the rubbee prospects are generally good.
	Fyzabad	„	...	„		
	Raipore	December 2	...	December 7	Khureef crops cut and stacked; rubbee crops are a few inches above ground and show a good appearance, but rain is much wanted. Cattle disease has disappeared.	

CENTRAL PROVINCES	Sumbulpore	...	„	...	*Nil.*	„	Rice being cut generally.	
	Belaspore	...	„	...	...	„	No change.	
	Nagpore	...	December 6	...	*Nil.*	„	Atmosphere dry and cloudy. Tur crops have suffered greatly; jowaree poor except on black soil; rubbee crops look promising but want rain; prices falling owing to fall of rain in Bombay Districts.	
	Wurdha	...	„	...	*Nil.*	„	Khureef crops harvested and produce fair; fears entertained about rubbee crops from want of rain.	
	Jubbulpore	...	„	...	*Nil.*	„	Prospects of rubbee good; cotton being gathered.	
	Saugor	...	„	...	...	„	Jowaree cut and gathered; cotton ready to be gathered.	
	Dumoh	...	„	...	...	„	Rubbee sowings good, but rain wanted.	
	Seonee	...	„	...	...	„	Rubbee crops doing well; cotton slightly damaged by the late rain; jowaree being reaped.	
	Hoshungabad	...	December 5	...	0·70	„	Prospects fair.	
	Baitcol	...	„	...	1·50	„	Prospects fair.	
	Nursingpore	...	„	...	0·30	„	Rain general over the whole district and has done much good; more wanted. Weather unusually hot and sultry for the season. Crops in good order.	
	Nimar	...	„	...	0·03	„	Khureef crops good; rubbee bad.	
BERAR	East Berar	...	December 7	...	*Nil.*	December 7	... No rain during fortnight. Rubbee prospects good throughout. The Woon khureef crops good, Ellichpoor khureef little below average. In one part of Oomrawuttee khureef about a third below average. New cotton coming in.	
	West Berar	...	„ 6	...	*Nil.*	„ 6	... No rain during the fortnight. Besides a very indifferent autumn harvest, the spring harvest, with the exception of gram, will fail, unless there is rain soon.	In many places the autumn harvest is but some half grown jowaree and a little cotton, and spring sowings have been abandoned. Weather unusually warm for the season.
RAJPOOTANA	Serohi	...	November 25	...	·28	December 6	... Tanks dry, wells very low, rubbee prospects very poor.	During the last fortnight, there have been good showers over Meywar, Ajmere, and part of Marwar, which are being taken advantage of to put in wheat and grain, and by which prospects have much improved.
	Meywar	...	„	...	2·3	„	... Weather cloudy, small tanks have received considerable supply of water, which greatly enlivens the rubbee prospects. Sowing vigorously progressing.	
	Marwar	...	„	...	·75	„	... Rubbee prospects improved much, but still poor.	
	Kota, Deolee, Jalawar	...	„	...	1·25	„	... Tanks and wells full, rubbee prospects good.	

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
RAJPOOTANA—*continued*	Bhurtpore ...	November 25 ...	*Nil.*	December 6 ...	Rubbee prospects fair.	During the last fortnight, there have been good showers over Meywar, Ajmere, and part of Marwar, which are being taken advantage of to put in wheat and grain, and by which prospects have much improved.
	Jeypore ...	„ ...	·4	„ ...	Tanks and wells as usual, rubbee prospects favorable.	
	Ajmere Mhairwarrah	„ ...	1·1	„ ...	In Ajmere the tanks are fairly filled; water is scarce in Upper Mhairwarrah; relief works opened; rubbee sowings progressing; prospects improved.	
CENTRAL INDIA ...	Indore ...	December 6 ...	·14	December 7 ...	Rubbee crops mostly gathered; an average yield is expected. Prospects of the khureef crops favorable.	
	Gwalior ...	„ ...	...	„ ...	Rain wanted; weather changeable.	
	Rutlam ...	.....	...	.....	No return received.	
	Baghelcund ...	.....	...	.....	Ditto.	
B. BURMAH ...	Tounghoo ...	December 5 ...	*Nil.*	December 7 ...	No alteration in state of crops.	
	Thayetmyoo ...	„ 6 ...	„	„ ...	Prospects good.	
	Amherst ...	„ ...	„	„ ...	Prospects fair.	
	Rangoon ...	„ ...	„	„ ...	Ditto.	
MYSORE AND COORG ...	Bangalore ...	December 7 ...	...	December 7 ...	No rain at Bangalore, and very little in the district, during the past fortnight; crops favorable; paddy being harvested.	Generally the rain-fall has been sufficient for the season, and agricultural prospects continue favorable.
	Mysore ...	„ 5 ...	1·14	„ ...	Crops thriving.	
	Coorg ...	„ 6 ...	1·9	„ ...	An extraordinary fall of rain on the 23rd November caused much damage to crops in the Yeloosavarasema Taluk; agricultural prospects otherwise continue favorable.	

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

IRRIGATION OPERATIONS OF FUSL KHURREEF IN THE PUNJAB UP TO 30TH SEPTEMBER 1871.

CANAL DIVISION.	WATER DISTRIBUTED DURING SEPTEMBER 1871. Depth in Canal at Regulating Gauge. Full Supply.	Actual throughout	Gross Consumption C. Ft. per Second. Estimated Full Supply.	Actual average throughout	NAVIGATION RETURN CANAL. Principal Items of Traffic. Up.	Down.	LAND IRRIGATED (APPROXIMATE). Zillah.	Acres.	RAINFALL. Average.	During Month.	CHIEF CROPS (APPROXIMATE). Name.	Area in Acres.	Remarks.
BAREE DOAB CANAL. 1st Division ...	4·90	3·06	3073·6	1025·84	...	...	Goordaspoor	8,426	2·33	2·10	Cotton ...	16,708	The approximate decrease is 12,168 acres. This is attributed in the 2nd Division, Baree Doab Canal, to the falling off in the cultivation of rice and miscellaneous crops, partly caused by a plentiful rainfall in the Upper District of the Canal.
2d Divn. Main Branch, Lower	4·60	2·60		706·81	...	...	Umritsur ..	18,265	...	...	Rice ...	10,078	
2d Divn. Lahore Branch ...	3·30	2·34		590·71	...	...	Lahore ...	33,553	5·20	0·20	Sugar-cane	6,015	
											Others ...	27,443	
TOTAL B. D. CANAL ...	...	...	3073·6	2323·36	*Nil*	*Nil*	...	60,244	...	...	...	60,244	
CORRESPONDING PERIOD OF LAST YEAR ...	...	...	3073·6	1592·25	*Nil*	*Nil*	...	72,412	...	...	...	72,412	
WESTERN JUMNA CANALS. Kurnaul Division ...	4·33	3·65	2546·00	413·88	...	177,624	Umballa ...	1,358	3·32	2·56			39·12 cubic feet per second passed through the escapes. The decrease on the Western Jumna Canal is 17,525 acres; this is attributed to the heavy rainfall.
Delhi „ ...	4·49	3·26		590·34	...	Kurries,	Kurnaul ...	28,303	3·36	0·77	Cotton ...	80,641	
Hansi „ ...	8·89	7·53		761·50	...	Bullies,	Delhi ...	31,677	...	1·10	Rice ...	17,678	
„ Bulla Head ...	8·40	7·06		249·96	...	and Logs.	Rohtuck ...	35,994	2·9	0·60	Sugar-cane	27,869	
							Hissar ...	24,731	2·0	0·70	Others ...	8,260	
							Jheend ...	12,219	...	1·60			
							Bikaneer ...	166	...	...			
TOTAL W. J. CANALS ...	...	...	2546·00	2015·68	...	177,624	...	1,34,448	...	...	...	1,34,448	
CORRESPONDING PERIOD OF LAST YEAR ...	...	...	2546·00	1646·00	...	161,608	...	1,51,773	...	...	...	1,51,773	There is an increase of about 41,065 acres from the irrigation of the Inundation Canals.
INUNDATION CANALS. Upper Sutlej Division ...	...	...	...	...	...	...	Lahore ...	6,000	...	...	Detail not obtainable for want of establishment.		This calls for no special remarks.
Lower Sutlej and Chenab	...	...	...	...	...	...	Montgomery	54,000	...	...			
Indus Canals ...	...	...	...	...	...	...	Mooltan ...	2,02,007	...	...			
							Dera Ghazee Khan ...	1,70,000	...	...			
TOTAL INUNDATION CANALS ...	...	...	..	...	.	..	...	1,32,007	...	...	...	*4,32,007	* It is probable that some Rubbee Irrigation is included in these figures.
INUNDATION CANALS. CORRESPONDING PERIOD OF LAST YEAR ...	...	...	...	...	...	...	...	3,90,942	...	...	...	3,90,942	
DELHI AND GOORGAON WORKS	...	...	..	...	...	...	...	...	...	...	...	...	
TOTAL DELHI AND GOORGAON WORKS ...	...	...	...	...	...	...	...	1,965	...	...	...	1,965	This Statement completes the returns of irrigation operations of the Province during the Khurreef 1871-72.
PERENNIAL CANALS—CORRESPONDING PERIOD OF LAST YEAR	...	...	...	..	...	161,608	...	2,24,185	...	...	...	2,24,185	
PERENNIAL CANALS—GRAND TOTAL ...	...	...	...	...	...	177,624	...	1,94,692	...	...	...	1,94,692	

LAHORE,
The 9th November 1871.

W. BROADFOOT, *Lieut., R.E.,*
Asst. Secy. to Govt., Punjab, P. W. D., Irrign. Branch.

IRRIGATION OPERATIONS OF 1870-71.

Comparative Statement of Irrigation and Rain-fall for years 1869-70 *and* 1870-71 *in Canal Districts of the Punjab.*

ZILLAHS.	Population.	Area in Acres.	Cultivated Area in Acres.	AREAS IRRIGATED. Khurreef, 1870-71. Total Acres.	Kh. In comparison with 1869-70. Increase.	Kh. Decrease.	Rubbee, 1870-71. Total Acres.	Rub. In comparison with 1869-70. Increase.	Rub. Decrease.	Whole Year, 1870-71. Total Acres.	W. In comparison with 1869-70. Increase.	W. Decrease.	Percentage of increase or decrease in 1870-71.	RAINFALL. 1869-70.	1870-71.	Percentage of decrease, 18	REMARKS.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Umballa	10,35,483	16,81,825	9,53,029	4,412	...	1,364	4,750	...	841	9,162	...	2,205	19·4	30·6	47·7	...	In comparison with the year 1869-70, there is an increase in the area irrigated from perennial canals of 11,446 acres, the decrease on the Western Jumna Canal being more than compensated for by the increase on the Baree Doab Canal.
Kurnal	6,10,987	15,05,171	6,52,968	57,067	...	6,498	64,497	...	5,919	1,21,564	...	12,417	9·2	12·3	31·5		
Delhi	6,08,850	7,85,486	5,08,645	52,618	...	7,390	64,359	...	2,035	1,16,977	...	9,425	7·5	21·8	23·7		
Rohtuk	5,36,959	11,66,855	9,07,423	53,277	5,931	...	45,630	...	4,285	98,907	1,646	...	1·7	17·4	15·7	9·8	
Hissar	4,84,681	22,65,428	13,50,319	30,473	...	6,164	36,652	...	4,266	67,125	...	10,130	13·4	8·9	19·9		
Jheend	...	...	...	20,538	...	304	28,150	...	155	48,688	...	459	·9				
Bekaneer	...	...	...	149	...	140	133	...	406	282	...	546	65·9				
TOTAL W. J. CANAL ...	32,76,965	74,04,765	43,72,384	2,18,534	5,931	21,899	2,44,171	...	17,907	4,62,705	1,646	35,482	6·8				
Goordaspoor	6,55,362	8,58,570	6,73,818	14,577	...	27,350	16,855	...	5,546	31,432	...	32,896	51·1	27·2	31·9		
Umritsur	10,83,514	9,98,351	6,64,249	30,775	...	10,038	82,768	31,403	...	1,13,543	21,365	...	23·1	25·1	16·4	34·6	
Lahore	7,88,902	23,34,225	9,85,888	43,291	10,506	...	90,944	46,307	...	1,34,235	56,813	...	73·4	31·2			
TOTAL B. D. CANAL ...	25,27,778	41,91,146	23,23,955	88,643	10,506	37,388	1,90,567	77,710	5,546	2,79,210	78,178	32,896	19·4				
TOTAL PERENNIAL CANALS ...	58,04,743	1,15,95,911	66,96,339	3,07,177	16,437	59,248	4,34,738	77,710	23,453	7,41,915	79,824	68,378					
Delhi and Goorgaon Works and Inundation Canals.																	
Delhi	As given above.			201	...	225	1,468	...	1,438	1,669	...	1,663	50·0	...	...	...	Compared with the irrigation from these Inundation Canals during 1869-70, there is a decrease of 36,705 acres principally in the Montgomery District. This is owing to the annual rise of the water having been much later than usual, and further to the river having changed its course during the season, thereby depriving the canals of their supply much earlier than usual.
Rohtuk	As given above.			370	370	...	2,536	2,536	...	2,906	2,906						
Goorgaon	6,96,046	12,90,158	9,76,475	735	...	418	3,081	...	2,180	3,816	...	2,598	40·5	22·9	15·7	31·4	
Lahore	As given above.			4,335	1,680	...	2,871	...	1,121	7,206	559		8·7				
Montgomery	3,59,437	35,69,746	5,38,240	55,493	...	22,943	14,372	...	46,470	69,865	...	72,284	50·9	11·1	4·2	62·1	
Mooltan	4,71,509	37,64,326	5,00,526	1,33,365	...	24,139	68,672	...	16,917	2,02,037	...	41,056	17·0	4·1	1·9	53·6	
Dera Ghazee Khan ...	3,08,840	14,84,382	2,34,968	1,25,186	298	...	19,156	17,730	...	1,74,342	18,028	...	11·5	10·85	6·5	4·01	
TOTAL DELHI AND GOORGAON WORKS AND INUNDATION CANALS	18,35,832	1,01,08,612	22,50,209	3,19,685	2,348	47,725	1,42,156	20,266	68,126	4,61,841	21,493	1,17,601					
GRAND TOTAL ...	76,40,575	2,17,04,523	89,46,548	6,26,862	18,785	1,06,973	5,76,894	97,976	91,579	12,03,756	1,01,317	1,85,979					

LAHORE,
26th *October* 1871.

Combining the irrigation from all sources, the net decrease is **84,662** acres. This decrease being in the area irrigated by the Inundation Canals, the revenue of the year will not be seriously affected.

W. BROADFOOT, *Lieut., R. E.,*
Assistant Secretary to Government of Punjab, P. W. Dept., Irrigation Branch.

IRRIGATION OPERATIONS OF FUSL KHURREEF IN THE N.-W. PROVINCES UP TO 30TH SEPTEMBER 1871.

CANAL DIVISIONS.	Water distributed during the month. Depth in Canal at Regulating Gauge. Full supply, feet.	Actual throughout, feet.	Gross Consumption, cubic feet, per second. Estimated full Discharge.	Actual Average throughout.
Ganges Canal. Northern ...	10·00	4·5	710	...
Meerut ...	8·10	3·8	1,037	452
Futtehgurh ...	6·80	3·5	667	34
Boolundshuhur ...	6·35	3·7	933	...
Allygurh ...	5·60	3·4	1,053	61
Etawah ...	4·80	1·6	771	...
Cawnpore ...	6·20	3·7	958	...
TOTAL ...	...	...	6,129	547
Eastern Jumna Canal ...	..	4·5	...	1,132·5
Doon Canals ...	...	...	...	34
Bundelkhund Irrigation Works	...	...	...	...
Rohilkhund Canals ...	...	...	...	470
GRAND TOTAL ...	...	...	6,129	2,183·5

Navigation Return, Ganges Canal. Principal items of traffic.

Nature of Traffic.	Up. Mds.	Up. No.	Down. Mds.	Down. No.	Total Up and Down. Mds.	Total Up and Down. No.
GRAINS—						
Oorud ...	...	...	615	...	615	...
Wheat ...	...	...	1,623	...	1,623	...
Moong ...	...	...	1,673	...	1,673	...
Urhur ...	...	...	12	...	12	...
Barley ...	...	...	125	...	125	...
Bhajhur ...	...	...	125	...	125	...
Gram ...	3,340	...	...	...	3,340	...
Paddy or Dhan	...	...	80	...	80	...
TOTAL ...	3,340	...	4,253	...	7,593	...
Cotton ...	...	...	3,106	...	3,106	...
Oil-seeds ...	...	...	23	...	23	...
Salt ...	...	...	300	...	300	...
Metals ...	2,785	...	125	...	2,910	...
Building Materials ...	5,700	...	8,962	...	14,662	...
Misc. Goods ...	1,257	...	1,283	...	2,540	...
Firewood ...	...	...	2,735	...	2,735	...
Bamboos ...	...	...	...	40,000	...	40,000
Tors or unsquared timber ...	...	...	...	335	...	335
Kurrees or squared timber ...	...	...	...	1,948	...	1,948
Logs ...	.	...	...	9	...	9
Misc. Timber ...	...	...	...	269	...	269
Live Stock ...	...	...	...	4	...	4
GRAND TOTAL	13,082	...	20,787	42,565	33,869	42,565
Fusl Khurreef, 1870-71, to 30th September 1870	12,383	1348	9,329	33,291	21,712	34,639
Decrease, 1871 ...	...	1348	...	...	...	...
Increase, 1871 ...	699	..	11,458	9,274	12,157	7,926

Land Irrigated (approximate).

Zillah.	Acres.
Saharunpore ...	27,672
Moozuffernuggur	36,533
Meerut ...	35,956
Boolundshuhur ...	26,925
Allygurh ...	41,239
Muttra ...	5,321
Agra ...	454
Etah ...	11,122
Mynpoory ...	9,625
Futtehgurh ...	6,334
Etawah ...	13,524
Cawnpore ...	19,386
Dehra Doon ...	5,116
Bijnour ...	381
Terai ...	4,688
Bareilly ...	9,563
Jhansie ...	81
Humeerpore ...	287
TOTAL ...	254,207
Total up to corresponding date of Fusl Khurreef, 1870-71 ...	330,619
Decrease, 1871 ...	76,412

Rainfall.

	Total from 1st April 1871 to 30th September 1871.	Average of ten previous years, for the same period.
Saharunpore ...	48·1	34·4
Moozuffernuggur	30·6	26·9
Meerut ...	27·4	24·3
Boolundshuhur ...	25·2	19·8
Allygurh ...	28·4	24·8
Muttra ...	35·1	24·3
Agra ...	35·3	23·3
Etah ...	24·6	28·0
Mynpoory ...	40·2	31·3
Futtehgurh ...	31·2	30·9
Etawah ...	41·1	29·7
Cawnpore ...	30·8	29·5
Dehra Doon ...	102·3	70·5
Bijnour ...	41·2	30·1
Terai ...	75·2	30·2
Bareilly ...	49·0	38·4
Jhansie ...	42·2	33·8
Humeerpore ...	38·9	32·4
Total up to corresponding date of Fusl Khurreef, 1870-71 ...	..	...
Decrease, 1871 ...	...	...

REMARKS.

Cub. ft.
GANGES CANAL.—Mean volume of water passing the Solanee aqueduct 2,028

Volumes discharged—

	Cub. ft. per sec.	
Etawah Branch, Tail ...	56	
,, ,, Escapes	895	
Cawnpore ,, Tail ...	222	
,, ,, Escapes	768	
		1,941
Balance expended ...		87

Which does not agree with the statements of expenditure in the different divisions, owing, no doubt, to the disturbing effect which a closure of the canal always exercises on the gauges.

There was no demand for water except to a small extent in the Meerut and Allygurh Divisions; and no calls for water are expected in the districts watered by the lower section of the canal before December.

There were heavy falls of rain about the middle of the month, flooding the country in the Cawnpore Division and causing some damage to crops.

Rubbee ploughing is in progress, but was commenced late in the season, owing to recent heavy rains.

EASTERN JUMNA CANAL.—The demand for rice during the first part of the month was steady, and increased towards the middle of the month. At the close of the month the demand for the khurreef crops fell off, but that for pulse was expected to increase.

The demand for cotton and Indian corn had been stopped by the heavy rain which fell in the early part of the month, but towards the latter end of the month irrigation for rice, sugar, Indian corn and cotton was progressing actively.

DOON CANALS.—Demands for rice were well sustained throughout the month, notwithstanding the heavy fall of rain in the early portion of the month.

TRAFFIC.—There is a considerable increase manifest in the "down" traffic during the month over that of the corresponding month last year. In the "up" traffic there is a falling-off under the head of timber.

ALLAHABAD,
The 31*st October* 1871.

P. S. MARINDIN, *Capt., R. E.,*
Asst. Secy. to Govt., N.-W. P., Irrigation Branch.

IRRIGATION OPERATIONS OF FUSL KHURREEF IN THE N.-W. PROVINCES UP TO 31st OCTOBER, 1871.

GANGES CANAL.

CANAL DIVISIONS.	WATER DISTRIBUTED DURING THE MONTH. Depth in Canal at Regulating Gauge. Full Supply, feet.	Actual through-out, feet.	Gross Consumption, cubic feet per second. Estimated full Discharge.	Actual Average throughout.	NAVIGATION RETURNS, GANGES CANAL. Principal Items of Traffic. Up. No.	Up. Mds.	Down No.	Down Mds.	Nature of Traffic.	LAND IRRIGATED (APPROXIMATE). Zillah.	Acres.	RAINFALL. Total from 1st April, 1871, to 31st October 1871.	Average of ten preceding years for the same period.	REMARKS.
Northern ...	10·00	5·38	710	248		...		2,540	Grains—Oord	Saharunpore ...	27,672	48·1	34·62	Ganges Canal.—Mean volume of water passing Solanee aqueduct ... 2,535 cub. ft.
Meerut ...	8·10	4·3	1,037	312		...		625	Barley	Moozuffurnuggur	45,057	30·6	27·39	cub. ft. per sec.
Futtehgurh ...	6·80	3·1	667	31		...		3,925	Wheat	Meerut ...	65,312	27·4	24·74	
Boolundshuhur...	6·35	3·9	933	124		...		63	Bajra	Boolundshuhur...	29,504	25·2	20·49	Volumes discharged— Kiawah Branch, Tail ... 42
Allygurh ...	5·60	3·7	1,053	77		...		2,090	Moong	Allygurh ...	41,239	28·4	25·53	,, Escapes ... 435
Etawah ...	4·80	1·8	771	253		...		970	Urhur	Etawah ...	5,321	35·1	24·57	Cawnpore ,, Tail ... 213
Cawnpore ...	6·20	3·9	958	354		...		25	Mucka	Muttra ...	454	35·3	23·92	,, Escapes ... 431
Total ...	...	...	6,129	1,399		...		20	Kooltee	Agra ...	11,122	24·6	28·97	1,136
						...		4,699	Grain	Etah ...	9,625	30·2	32·49	Balance expended ... 1,399
						4,953		10,258	Total	Mynpoory ...	6,334	31·2	32·11	Demands in the Upper and Central Divisions were slight in the beginning of the month, but improved considerably towards its close. In the Lower Divisions they were slight throughout the month. In the Northern Division the bursting of one of the head bunds on the 27th delayed for some days, the entrance of the full supply.
Eastern Jumna Canal ...	...	4·7	...	1,268		...		...	Cotton	Futtehgurh ...	13,524	41·1	31·05	
						...		4,271	Oil-seeds	Etawah ...	19,386	30·8	31·42	
Doon Canals ...	...	...	...	86		...		105	Salt	Cawnpore ...	5,116	102·3	71·46	
						...		815	Metals	Dehra Doon ...	960	41·2	30·80	Ganges Canal.—In the early part of the month demands in the lower half of the canal were heavy for the rabbee, but slight for khurreef. Towards the close of the month demands in the Moozuffurnuggur and Meerut and lower half of Saharunpore Districts, increased largely.
Bundelkhund Irrigation Works ...	...	...	...	...		...		850	Building Materials	Bijnour ...	4,688	75·2	31·29	
						...		1,050	Miscel. Goods	Terai ...	9,563	49·0	29·54	
Rohilkhund Canals ...	...	...	...	50		...		3,961	Firewood	Bareilly ...	197	42·2	34·81	
						...		332	Bamboos	Jhansie ...	287	38·9	33·70	
						...		...	Tors or unsquared Timber	Humeerpore ..	295,351	...	...	Doab Canals.—Demand for rice was small in the early part of the month. Rabbee demands commenced about the middle of the month, and were well sustained to the close.
						...		...	Kurrees or squared Timber	Total ...				
						...		60	...					Traffic.—A considerable increase in the "up" traffic, chiefly in hardware and building material. In the "down" traffic there is an increase in "timber," but a falling off in hardware, salt, building material, and fuel; the former preponderates. From the 12th to 24th a lock in the Northern Division was closed for repairs.
						...		100	Logs	Khurreef of 1870-71, up to 31st Oct. 1870	355,114	...	...	
						...		...	Miscel. Timber					
						...		...	Passengers					
Grand Total ...				1,404	160	20,645	190,197	39,747	190,367	Total ...	295,351	...	...	
Fusl Khurreef, 1870-71, to 31st October ...					160	25,263	178,466	32,723	178,626					
					7,440					Decrease	59,763	...	...	
Decrease ...						4,638								
Increase ...			6,129	2,903		11,662	...	7,024	11,731					
Grand Total...	...	...	6,129	2,903										

P. S. MARINDIN, *Capt., R. E.,*
Asst. Secy. to Govt., N.-W. P., Irrigation Branch.

ALLAHABAD,
The 23rd November 1871.

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SUPPLEMENT TO
The Gazette of India.

CALCUTTA, SATURDAY, DECEMBER 16, 1871.

OFFICIAL PAPERS.

A Supplement *to the* Gazette of India *will be published from time to time, containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

Non-Subscribers to the Gazette *may receive the* Supplement *separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.*

No Official Orders or Notifications, the publication of which in the Gazette of India *is required by Law, of which it has been customary to publish in the* Calcutta Gazette, *will be included in the* Supplement. *For such Orders and Notifications the body of the* Gazette *must be looked to.*

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

TELEGRAPH RULES AND RATES.

The following Revised Rules and Traffic relating to the Despatch of Telegraph Messages in India, British Burmah, and Ceylon, sanctioned by the Governor General in Council with effect from the 1st January 1872, are published for general information:—

GENERAL.

Rule I.—The accuracy of messages is not guaranteed, and the sender and receiver must accept all risks arising from non-delivery, errors, or delays.

Rule II.—Telegraph Stations are divided into three classes—1*st*, those performing permanent day and night duty; 2*nd*, those performing full day duty; 3*rd*, those of limited day duty.

Classification of Offices.

Except on the days stated in Rule III, stations of the 1st class are open day and night for the reception and transmission of messages.

Office hours.

Stations of the 2nd class are open from 7 A. M. till 9 P. M.

Stations of the 3rd class are open from 10 A. M. till 5 P. M., and on Sundays and the holidays enumerated in Rule III, from 7 to 8 A. M. and from 4 to 6 P. M.

Rule III.—All Offices will be closed to the public between the hours of 8 A. M. and 4 P. M. (local time) on Sunday, Christmas Day, New Year's Day, Good Friday, and the Queen's Birthday.

Hours of business on Sundays and Holidays.

Rule IV.—In cases of life and death, or of extraordinary emergency, a message countersigned by the chief Civil or Military authority at a station, or by any of the authorities empowered to "clear the line" (see Rule XLVI), can be sent from any Office at any time.

Exceptions in favor of emergent telegrams signed by competent authority.

Rule V.—No message or messages of more than 200 words can be sent at any one time by any private individual or firm, and no second message by the same individual or firm till after the lapse of three hours, unless the lines be free and not required by any one else.

Limit to length of messages.

Messages should be legibly written and clearly expressed.

Rule VI.—Senders of messages are advised to write their messages in an unmistakeable and distinct hand, and to use the shortest and most familiar words they can select. The more intelligible the message, the greater is the probability of its being correctly transmitted.

ACCEPTANCE OF MESSAGES FOR TRANSMISSION.

Messages must be legibly written in the Roman character.

Messages in the vernacular.

Rule VII.—Messages must be in the Roman character, and legibly written. Messages can be sent in vernacular, if written in the Roman character; the charge will be the same as for a message in a foreign language.

Messages translated for natives.

At stations other than the Presidency Towns, every assistance possible is afforded to natives in the translation of messages into English or *vice versâ*.

Form to be followed.

Rule VIII.—The body of the message must be preceded by the address, and followed by the signature. The true signature and address of the sender must always be written at the foot of the message.

Verification of private messages may be insisted upon.

The sender of a private message can always be called upon to prove that the signature attached to it is genuine.

Full address necessary.

Rule IX.—The address must contain all the information necessary to ensure the delivery of the message at its destination, and the sender must in all cases support the consequences of insufficiency of address. After the message is once despatched, it can neither be completed nor rectified except by the despatch of a fresh message.

Ordinary, cipher, Code, and *foreign* messages.

Rule X.—Messages may be written in *ordinary English language*, in *cipher*, in *Code*, or in any *foreign language* written in the Roman character.

Ordinary messages can contain only standard English dictionary words.

Cipher messages are those which consist wholly or in part of groups of figures or letters not forming words. The whole of the cipher portion must be composed *exclusively* of letters of the alphabet or exclusively of figures. The body of the message may consist either wholly of cipher or partly of cipher, and partly of ordinary language. The parts in cipher must be placed between parentheses, separating them from the rest of the message.

EXAMPLES OF CIPHER MESSAGES WHICH ARE ADMISSIBLE.

"(1597) (63289) (159) (18176 4)."

"Send sharp (839) (2146). Further shipments (154)."

"(A V K) (B) (C P G) (G K R S N)."

"Exchange falling (B K S) (F B J K) No demand (B K J)."

EXAMPLES OF CIPHER MESSAGES WHICH ARE NOT ADMISSIBLE.

"(45 A B C) (234 X Y Z)."

"(1234) (P Q R) (C B G) (789)."

"Code" messages are those in which a number of recognised words follow each other without forming sense.

Messages consisting of nouns, adjectives, &c., unconnected by verbs and other parts of speech necessary for the formation of sentences are considered "code" messages. Cipher and code messages are always repeated back by every station *en-route* to ensure the greatest possible accuracy.

No unusual abbreviations or combinations permitted.

Rule XI.—Messages in ordinary language can contain no unusual combinations, abbreviations, or constructions, nor words of more than six syllables. Any word in common use, which, although requiring two words to express, is generally recognised as one word, is charged as one word when so written; when the two parts are not joined by a hyphen or apostrophe, and when

less than seven syllables. "Halfpenny," "Twopence," "Threepence," up to "Elevenpence," when written as a single word, count as one word only. "F. O. B." and "C. F. I.," when written as separate letters, are each counted as three words, but when written "Fob," "Cfi," as one word.

Authentication of corrections necessary.

Rule XII.—Every interlineation, reference, erasure, or alteration of words should be authenticated by the sender of the message, or by his representative.

Messages sent by Post to Telegraph Stations for transmission.

Rule XIII.—Messages from places where there is no Telegraph Station should be addressed to the nearest Government Telegraph Office by Post registered, together with Telegraph Stamps sufficient for their payment; or if Telegraph Stamps be not procurable, Postage Stamps at the rate of seventeen annas per Rupee. Such messages are charged at the day rate at whatever time they may reach the Telegraph Station.

Treatment of messages received by Post for transmission insufficiently stamped.

In the case of a private message sent by Post to a Telegraph Station with an insufficient number of stamps, the message and stamps will be returned "Bearing" to the sender, who should in all cases give his full address.

Messages addressed to non-Telegraph Stations.

Rule XIV.—Messages can be addressed to places where there are no Telegraph Stations. In such cases, the sender must state from what Telegraph Station the message should be posted.

Example.—To Kalka, "Post Umballa," or Kalka, "Post Kussowlie." To Gudduck, "Post Dharwar," or Gudduck, "Post Bellary." No charge will be made for *inland* postage, which is defrayed by the Telegraph Administration.

If the sender of a message that has to be delivered by *inland* post wishes it to be sent to destination by registered Post, he must prepay the postal registration fee of four annas, and intimate that this has been done by placing the words "Post registered," instead of "Post," before the name of the Telegraph Station at which the message is to be posted.

Postal registration is compulsory in the case of messages addressed to places beyond Indian limits, and in such cases the postage and registration fees must be prepaid.

Service messages take their turn for despatch with private messages.

Rule XV.—Service messages have no right of precedence, and take their turn for despatch with private messages, except in cases of pressing public emergency, when priority may be claimed on special grounds.

"Bearing" messages.

Rule XVI.—With the following exception, all charges for messages must be prepaid in cash or in stamps:—

Messages are sent "bearing" from sea-ports when received by mail steamers or other vessels for despatch, but no such message "prepaid" or "bearing" will be received for transmission until the name of the vessel has been made known. ***Bearing messages will not be delivered to the addressees until after payment has been obtained.***

Use of Stamps.

Rule XVII.—All charges on telegrams are prepaid in Telegraph Stamps, which are procurable at every Treasury and every Government Telegraph Station.

Form of Stamp provides a guarantee to the sender and to Government.

Telegraph Stamps are double-headed, the object being that the *upper half* shall be returned on the receipt (whereby the sender receives a guarantee that his message has not been suppressed for the sake of the stamps), and the *lower half* shall be affixed to the message as voucher to Government that it has been prepaid.

Stamps to be properly affixed to the forms.

The senders of messages should be careful to affix their stamps on the spaces left blank for the purpose on the message forms, *the upper half on the receipt, the lower half on the message*, and to see that the Stamps are defaced with the Office Stamp which bears the name of the station and date.

Cut or defaced Stamps cannot be received.

Telegraph Stamps cut in two, before being sent into a Telegraph Office, or which are in any way defaced, cannot be accepted.

Forms obtainable *gratis* at all stations.

Proper Forms on which to write messages are available *gratis* at all Telegraph Stations, and *senders are requested to use these forms only.*

No unpaid messages to be despatched under penalty.

Rule XVIII.—No unpaid messages, except those specified in the Departmental Regulations, shall on any account be transmitted. A violation of this rule will subject the Signaller or Telegraph Master in charge of the station from which a message is improperly despatched to dismissal from the public service.

Objectionable messages to be refused acceptance.

Rule XIX.—Telegraph Masters are required to refuse to transmit a message which may be of a decidedly objectionable or alarming character. Should the character of a message be disputed, the matter may be referred to a Secretary to Government, if the dispute occur at the seat of Government, or to the chief Civil or Military Officer if at a provincial station.

CHARGES.

Rule XX.—*No charge is made for the transmission of the address.*

Free address.

The address includes names of stations from and to which the message is to be despatched, the *bond fide* names of the sender and addressee, *and the latter's address*. No other words can be transmitted unless paid for as part of the body of the message, and the Officers of the Telegraph Department are authorized to omit from the address any words which are not essential to the correct delivery of the message.

Charge for a message in ordinary English language.

Rule XXI.—The following are the rates of charges for a message in ordinary English language—

a. Between any two stations in India, or between any two stations in the Provinces under the Administration of the Chief Commissioner of British Burmah, *one Rupee for every six words or less, exclusive of the address.*

b. Between any station in India and any station in British Burmah, or between any station in India and any station in Ceylon, *one Rupee eight annas for every six words or less, exclusive of the address.*

c. Between any station in Ceylon and any station in British Burmah, *two Rupees for every six words or less, exclusive of the address.*

Charge for a message in cipher, in code, words of concealed meaning, or in a foreign language.

Rule XXII.—The charge for a message in cipher, in code, or in a foreign language, is double the charge for a message in ordinary English language.

Messages despatched to and from Railway Stations without extra charge.

Rule XXIII.—A message can be sent from any station of the Government Telegraph Department to any Railway Telegraph Station, or *vice versâ*, without additional charge.

Ceylon local rates.

Rule XXIV.—The local rates in Ceylon are *one Rupee for* 20 *words inclusive of address*, for any description of message between any two stations *not exceeding* 200 *miles apart*, with eight annas for every additional ten or fraction of ten words. For distances greater than 200 miles, these charges are doubled. Double charges are levied on messages sent after hours or on holidays, the same as in India.

Occasions on which double charges are leviable.

Rule XXV.—A double charge will be levied on all messages tendered for transmission between the hours of 6 P. M. and 6 A. M. (local time), also on Sundays and the following holidays:—Christmas Day, New Year's Day, Good Friday, and the Queen's Birthday.

TARIFF.

No charge is made for the transmission of the address. See Rule XX.

For every six words or less, exclusive of the address.	In ordinary English language.	In cipher, code, or in a foreign language.	
	Rs. A.	Rs. A.	
Between any two stations in *India*	1 0	2 0	See Rules XXI(*a*) and XXII.
Between any two stations in the provinces under the administration of the Chief Commissioner of *British Burmah* ...	1 0	2 0	Ditto ditto.
Between any station in *India* and any station in *British Burmah*	1 8	3 0	See Rules XXI(*b*) and XXII.
Between any station in *India* and any station in *Ceylon* ...	1 8	3 0	Ditto ditto.
Between any station in *Ceylon* and any station in *British Burmah*	2 0	4 0	See Rules XXI(c) and XXII.

CEYLON LOCAL TARIFF.

For a message of 20 *words, including address.*

		For every additional ten or fraction of ten words.
Between any two stations in Ceylon not exceeding 200 miles apart	One rupee.	Eight annas.
Between any two stations in Ceylon exceeding 200 miles apart	Two rupees.	One rupee.

Words joined by a hyphen.

Rule XXVI.—Words joined by a hyphen are counted as so many separate words.

Words separated by an apostrophe.

Rule XXVII.—Words separated by an apostrophe are counted as so many separate words. (*This rule does not apply to nouns in the possessive case, as "General's," "Charles'," "Brother's"*).

Proper names, titles, &c.

Rule XXVIII.—Proper names of towns and persons, names of places, streets, ships, titles, Christian names, prefixes, and qualifications, are counted for the number of words employed to express them.

Every *separate* character, including an underline, charged as a word.

Rule XXIX.—Every *separate* character, whether letter or figure, is counted as a word. The same applies to an underline.

Signs of punctuation.

Rule XXX.—Signs which the instruments express by a single signal (signs of punctuations, hyphens, apostrophes, inverted commas, parentheses, fresh paragraphs) are not counted. But decimal points, commas, and bars of division, used with figures, are each counted as a figure. Signs used to separate groups in cipher messages are counted each as a figure or letter, unless the sender expressly desires that they be not transmitted.

Charges for figures.

Rule XXXI.—When numbers are expressed in figures in ordinary messages, each group of five or fewer figures is counted as a word; letters added to figures to form ordinal numbers are each counted as a figure.

Method of counting cipher messages.

Rule XXXII.—In cipher messages, the parts in cipher must consist exclusively of Arabic figures or exclusively of letters of the alphabet, and be placed between parentheses, separating them from the rest of the message. All the characters, figures, letters, or signs employed in the cipher text are added together, the total divided by five, and the quotient, plus one for the remainder, if there be any, gives the number of words the ciphers represent.

All words to be transmitted charged for.

Rule XXXIII.—All that the sender writes in his message to be transmitted is included in the cost, but the address of a message, as defined in Rule XX, *will be transmitted without charge.*

Date and time of receipt added by the department and transmitted *free.*

The day, hour, and minute of receipt of a message into a Telegraph Office for despatch are in every instance added by the department *and telegraphed free of charge.* Senders may, however, date their messages if they think fit, but the sender's date, if given, will be charged for, and, to avoid confusion with that given by the department, will, if written at the beginning, be transferred to the end of the message.

Multiple messages charged as separate messages.

Rule XXXIV.—A message addressed to several persons, or to the same person in localities where delivery is to be effected by different offices, is charged for as so many separate messages.

Multiple messages charged as one message.

Rule XXXV.—A message addressed to several persons in one locality, or to the same person at several places of residence in one locality, with or without transmission by post, is charged for as a single message, but a copying fee of four annas, independently of postage, if any, is charged for each destination after the first.

Charges on service messages.

Rule XXXVI.—Service messages from all public functionaries must be paid for in cash or in stamps prior to despatch: the rates are the same for service messages as those charged to private individuals. (*This rule will be relaxed in the case of Secretaries to Government and the chief Civil and Military officers of a station, but to them only in cases of emergency, the sender of the message being bound to take the necessary steps to ascertain the amount of the charges on it and to pay them into the Telegraph Office without fail within* 24 *hours*).

REGISTERED MESSAGES.

Registration of messages.

Rule XXXVII.—The sender of any message has the power of registering it.

Charge for registration.

Rule XXXVIII.—The charge for registering is equal to the charge for the message. A registered message is indicated by the word "*recommandée*," which, to ensure the greatest accuracy, is telegraphed (free) both in the official instructions and as the first word of the text of the message.

Treatment of registered messages.

Rule XXXIX.—When a message is registered, the different stations employed in its transmission collate it as it passes by, repeating it to each other integrally, and the terminal station, immediately after the delivery of the message, despatches a telegram to the sender announcing the exact time at which it reached its destination. If the message cannot be delivered, the return telegram indicates the circumstances which prevented delivery, and, if possible, gives the information necessary to enable the sender to cause his message to reach its destination.

Priority of return message.

Rule XL.—The return message has priority in transmission over other messages of the same class.

The return message can be sent to any station.

Rule XLI.—The sender of a registered message can have the return message addressed to him at any station by giving the necessary instructions. The words necessary to convey these instructions will be considered as part of the message, and charged for accordingly.

PREPAID REPLIES.

Rule XLII.—The sender of a message can prepay a reply. He must add the words "reply paid" or "answer paid." These must form the concluding words of the message, but will not be charged for. On depositing the corresponding sum the sender can add (free) to the words "reply paid" or "answer paid" the amount to which he wishes the reply to be limited. When the words "reply paid" alone are given, without any specified amount, it will be understood that the minimum charge only has been prepaid. **The terminal station pays to the receiver, in Telegraph Stamps, the amount prepaid, leaving it to him to send his answer how, and when, and to what address, he pleases; or not to send one at all. The reply is considered in every respect as a fresh message. Should it be impossible to effect delivery of a reply-paid message, the terminal station sends a telegram to that effect to the sender, and this telegram takes the place of the return message for which a reply has been prepaid.** *The words "reply paid" or "answer paid" entitle the addressee to receive the equivalent of the minimum charge only, and if he wishes to answer at a time when the double charge is levied, he must pay the additional cost himself. It should be distinctly understood that it is not compulsory on the addressee to send a reply. The duty of the Telegraph Department consists simply in paying to him in Telegraph Stamps the amount deposited, leaving him at liberty to do what he pleases with it.*

DELIVERY.

Free delivery within five miles of a Telegraph Station.

Rule XLIII.—Messages will be delivered free of charge at any place within five miles of a Telegraph Station. Beyond this distance, messages will be sent by Post or by such other means as the sender may arrange and pay for.

Words necessary to explain delivery are charged for.

Rule XLIV.—Any additional words that may be necessary to explain the delivery of a message, when its destination is more than five miles beyond the nearest Telegraph Station, will be considered as part of the message, and charged for accordingly.

Charge for re-addressing a message.

Rule XLV.—Should the addressee of a message leave the station to which it is addressed, and it be sent on by Telegraph to some other station, an additional charge of one Rupee for every six words of message in ordinary English language, and of two Rupees for every six words of message not in ordinary English language, must be paid by the addressee for every extra address, *before the telegram is delivered to him.*

CLEAR LINE MESSAGES.

Rule XLVI.—On emergent occasions of great importance, the public functionaries named below have the power to "clear the line," that is, to suspend the receipt and despatch of all messages until the one for which the line is "cleared" is passed on:—

(1).—The Governor General of India.

(2).—The Governors of Madras, Bombay, and Ceylon.

(3).—Commanders-in-Chief, India, Madras, and Bombay.

(4).—Lieutenant-Governors of Bengal, North-Western Provinces, and the Punjab.

(5).—Secretaries to the Government of India.

(6).—Secretaries to the Governments of Madras, Bombay, Bengal, North-Western Provinces, and Punjab.

(7).—Chief Commissioners of Oudh, the Central Provinces, British Burmah, and Mysore and Coorg.

(8).—Agents to the Governor General, Rajpootana and Central India.

(9).—Commissioners of Sindh and Peshawur.

(10).—Director General of Telegraphs in India.

(11).—The Resident at Hyderabad (Deccan).

The messages so sent are, however, to be paid for in cash or in stamps, as other service messages.

REFUNDS.

Under no circumstance is a refund given for a non-registered message.

Rule XLVII.—No refund will be made for a message delivered wholly or partially in an unintelligible state (or for late delivery, mis-delivery, or non-delivery) unless it be registered (*recommandée*). Applications for refunds, as also all complaints respecting messages, should be addressed to the *Telegraph Check Office, Calcutta.*

Every claim should be made, under penalty of rejection, within three months from the date of the message. *When an overcharge has been made on an Inland message through the neglect of the Telegraph employés, and when there exists no doubt whatever as to the justice of the claim, the amount overcharged will be repaid at once by the Telegraph Master.*

Conditions of refund in the case of a registered message.

Rule XLVIII.—If a registered message be not delivered through the fault of the Telegraph Department or be delayed or mutilated to such an extent as to be manifestly unable to fulfil its object, the whole charge made for it will be returned to the sender.

Not admissible when a message is cancelled at the sender's request.

Rule XLIX.—If the sender of an Inland message wishes to cancel it before transmission has commenced, he can do so; but the charges upon it will not be returned when once the stamps are obliterated. If the message is in course of transmission, or has already been despatched, it can only be cancelled by a paid message from the sender to the Telegraph Master of the terminal station. **If in addition the sender wishes to be informed by Telegraph in what manner his request has been acted upon, he must deposit the cost of the return telegram.**

OBLIGATION OF SECRECY.

Rule L.—To secure secrecy as much as possible, all persons, including Officers of the Department not actually on duty, are strictly prohibited from entering the signal-room. Breach of this regulation renders an offender liable to a fine of Rs. 100 under Act VIII of 1860.

Penalties for divulging the contents of a message.

Rule LI.—Violation of secrecy on the part of any person in the Department will be punished by dismissal from office, forfeiture of arrears of pay, and a declaration in the official gazette of the incapacity of the delinquent to serve the Government in any capacity. Breach of this rule renders the offender liable to the further punishment of fine, or to imprisonment with or without labor not exceeding two years, or to both. It is a violation of secrecy to mention the fact that a message has been received or despatched by any particular person or firm.

Certified copies of messages obtainable by sender and receiver.

Rule LII.—The sender and receiver have a right to be furnished with certified true copies of any message sent or received by them; a fixed charge of four annas is made for every copy furnished. As no Telegraph Office keeps copies of messages longer than three days, applications for copies required after that time has elapsed should be made to the Telegraph Check Office, Calcutta.

Applications for copies must be made within six months of the date of the message. At the expiration of that period all message drafts are destroyed.

One anna must be enclosed for postage of the reply, failing which it will be sent "bearing."

PRESS MESSAGES.

Rule LIII.—Under certain conditions, to be ascertained on application to the Director General of Telegraphs, (Traffic Branch), *bonâ fide* Press messages, *i. e.*, messages in the ordinary English language addressed to, and intended for publication in a newspaper, can be despatched at reduced rates.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

COAL EXPLORATIONS IN THE GODÁVARÍ DISTRICT.

No. 5049, dated 6th November 1871.

From—T. W. ARMSTRONG, Esq., C. E., Offg. Secy. to the Chief Commr., Central Provinces,
To—The Secretary to the Government of India, PUBLIC WORKS DEPT.

In continuation of former correspondence concluding with this office No. 4462, dated 4th ultimo, on the subject of coal explorations in the Godávarí District, I am directed to forward further reports received from the Superintendent of Works, Upper Godávarí Circle, detailing subsequent operations up to 3rd ultimo.

2. The Officiating Chief Commissioner desires me to invite especial attention to paragraph 5 of the Superintendent of Works letter of 22nd September, and to paragraph 2 of Mr. Vanstavern's report of 16th idem, from which it will be seen one of the strata of coal passed through was no less than 11 feet 6 inches in thickness; this result Colonel Keatinge considers as very satisfactory.

3. The later of the two sets of reports now sent up for information is remarkable chiefly for the difficulty experienced in getting down the boring tools, owing to iron clay having been met with in the bore holes.

No. 122-664, dated 22nd September 1871.

From—R. H. RHIND, Esq., C. E., Offg. Supdt. of Works, Upper Godávarí Circle,
To—The Secretary to the Chief Commissioner, Central Provinces.

I have the honor to submit a further report dated 16th September 1871, from Mr. Vanstavern, upon the progress made in coal explorations at Tiperpenti; a plan of the locality accompanies the report, which gives the positions of the new borings now in progress.

2. The borings which have been in progress since last report are Nos. 14, 16, 17, and 18; and of these Nos. 17 and 18 are now alone in progress, as Nos. 14 and 16 are completed; the borings having passed through the coal-bearing strata into the Tálchirs, which are understood to underlie the coal in India.

3. In boring No. 14 nothing further has been found beyond the seams of coal already reported, but in No. 16 the bed of coal has again been passed through, and it is satisfactory to find that the comparative concentration of the seams of coal has increased beyond that which was found to be the case in boring No. 14.

4. The part of the section of No. 16, which is not contained in the present report, will be found in Mr. Vanstavern's last letter on this subject, and consisted of a depth of 111 feet 2 inches bored through surface soil, sandstone, and clay, so that the bed of coal at this point is situated at a total depth of 123¼ feet below the surface of the ground.

5. The result given by this section is that at this point but one bed of coal exists, but with a total thickness of 20⅛ feet, of which 16⅔ feet are coal contained in only four seams, of which one is 11½ feet in thickness, and the remainder are 1 foot, 1⅔ feet, and 2½ feet thick. The thickest seam of coal (11½ feet) which has yet been struck has therefore been passed through in this boring, and the proportion of coal to shale in the bed is as 16⅔ to 3⅔, a considerably higher proportion than that met with in No. 14, where the total thickness of the bed was 18½ feet, and coal to shale as 12 to 6½.

So far as can be judged, from the appearance of the dust brought up by the boring rods, the coal seems to be of fair quality, but specimens have been sent to Calcutta for analysis, the result of which will be duly reported when received.

6. The new borings Nos. 17 and 18 are being put down in order to ascertain whether the coal extends over the whole of the area between No. 16 and the river bank, and also to find the dip of the beds and the probable average thickness.

Nothing has as yet been passed through in either, as they are not sufficiently far advanced, but some result may be obtained before the date of the next fortnightly report.

7. Of course before any accurate result can be obtained with regard to the probable area of the beds, a great many more borings will be required, as the area already examined is only partially explored, and forms only a small portion of the total area which is probably underlaid by coal.

No. 35, dated 16th September 1871.

From—T. VANSTAVERN, Esq., Executive Engineer, Workshop Division,
To—The Offg. Superintendent of Works, Upper Godávarí Circle.

In continuation of letter No. 34, dated 2nd current, I have the honor to submit report on coal-boring operations near Totápilly.

1. No. 14 Bore hole—

	Feet.	Inches.
Light coloured sandstone	3	0
Tálchirs	3	0

This is the first hole I have come to the Tálchirs in, at a depth of 152 feet 6 inches. The boring was stopped, Tálchirs being the strata underlying the coal in India.

2. No. 16 Bore hole—

	Feet.	Inches.
Sandstone	12	0
Coal	1	0
Black clay	1	0
Coal	2	6
Black clay	1	0
Coal	1	8
Shale	1	6
Coal	11	6
Dark clay	2	0
Light coloured sandstone	13	0
Tálchirs	3	0

This hole has also been stopped owing to striking Tálchirs.

3. In hole No. 14 coal was struck at 113 feet, and in 16 at 122 feet, distance between holes about 1,800 feet, giving a dip of 6 inches per hundred.

4. This hole No. 16 is further in towards the hill, and shows, as at first suspected, that the coal would thicken towards Daverpilly hill.

5. Further borings will be necessary towards the hill.

6. As it is also necessary to find out how the bed of coal lies towards the river, I have, to ascertain the dip of the bed, commenced two other holes Nos. 17 and 18.

7. I have sent specimens of coal from Nos. 14 and 16 bore holes to Mr. Blanford for the purpose of having them analyzed; should the coal prove fair, No. 16 would be a good workable seam; only before any shaft is sunk, I should recommend the whole of the area up to the hill to be tested, so as to find the most suitable place for a shaft on account of drainage of the mine.

8. Daverpilly hill forms a half moon, and it would be worth while to examine the valley in it.

9. Any part below the hill at the river side would be suitable for a place for loading boats, the water standing up to the bank the whole year round.

10. The work at present going on not being on the map I sent to you some time ago, I have had another one prepared with alphabetical-marked section, of which the section in which work is going on in future will be furnished with the report.

No. 17 Bore hole—

	Feet.	Inches.
Surface soil ...	13	6
Clay ...	1	0
Limestone ...	2	0
Light clay ...	3	0
Sandstone ...	39	6

No. 18 Bore hole—

Surface soil ...	23	0

No. 126-679, dated 5th October 1871.

From—The Superintendent of Works, Upper Godávarí Circle,

To—The Secy. to the Chief Commissioner, Central Provinces.

I have the honor to submit a further report dated 3rd October 1871, by Mr. Vanstavern, upon the progress made in coal explorations at Tiperpenti, together with a part plan of the scene of operations, showing the positions of the borings in progress from the 16th September up to the present time.

2. The progress made during this period has fallen short of that anticipated, as in two of the bore holes which were in progress great difficulty was experienced from the character of the strata passed through, which ultimately necessitated their abandonment, and the commencement of new borings in which fewer obstructions might be met with.

3. The borings which have been operated upon, since the date of last report, are Nos. 17, 18, 19, and 20, and the sections obtained from them are given in detail in the body of the report now forwarded. Of these borings Nos. 17 and 18 were being sunk when progress was last reported, and Nos. 19 and 20 are the new borings lately commenced.

4. Coal has been struck as yet in only one of them, No. 19, where the section obtained has been as follows :—

	Feet.	Inches.
Surface soil and gravel ...	20	0
Light and dark clay ...	19	0
Sandstone ...	13	0
Light clay ...	26	0
Shale ...	5	0
Coal ...	2	0
Shale ...	7	0
Shale and coal ...	1	0
TOTAL DEPTH ...	93	0

from which it appears that coal has been reached at this point, at a depth of 83 feet below the surface of the natural ground, but as yet in no great quantity.

5. From the sketch plan it, however, further appears that the level of the ground at this boring is 101·27, while that at boring No. 16, the last point at which coal was struck, is 113, or in other words the surface of the ground is 11·73 feet lower at No. 19 than at No. 16, so that the coal met with in No. 19 lies at a depth of 83 + 11·73, or 94·73 feet below the level of the ground at No. 16.

Coal was struck in No. 16 at a depth of 123 feet below the surface, or at a depth of 28¼ feet below the level at which it has been met in boring No. 19, so that although the first indications of the coal bed given by the above section in boring No. 19 are not very favorable, only one small 2-feet seam of coal having been passed through in a depth of 15 feet, there still remain 13¼ feet to

be passed through before the level of the bed at No. 16 is reached, in or below which the bed may be found to give a better yield in proportion to its thickness.

6. From the borings Nos. 17 and 18, which were intended to define the lie of the strata towards the river bank, no valuable information has been obtained, as they have had to be discontinued owing to the nature of the ground through which they had to be driven, iron clay having been met with in No. 17, and loose gravel in No. 18, through which it was found to be impossible to continue the borings without great expenditure and loss of time; the remaining boring No. 20 is not as yet sufficiently far advanced to afford any indications of coal, having been at the time of report only 56 feet below the surface of the ground.

No. 37, dated 3rd October 1871.

From—T. VANSTAVERN, Esq., Executive Engineer, Workshop Division,

To—The Offg. Supdt. of Works, Upper Godávarí Circle.

In continuation of my letter No. 35, dated 16th September last, I have the honor to submit a further report on the coal-boring operations at Totápilly.

1. No. 17 Bore hole—

	Feet.	Inches.
Reported ...	58	8
Sandstone ...	15	0
Iron clay ...	0	2
	73	10

After working for four days, trying to get through the iron clay, we only got down two inches, and, turning all the tools, found it useless to continue; we abandoned the hole and have commenced a new one, No. 19.

No. 19.

	Feet.	Inches.
Surface soil ...	8	0
Gravel ...	12	0
Light clay ...	12	0
Dark clay ...	7	0
Sandstone ...	13	0
Light clay ...	26	0
Shale ...	5	0
Coal ...	2	0
Shale ...	7	0
Shale and coal ...	1	0

Coal in this bore hole has been struck at a depth of 83 feet: deeper borings will test whether this is the bed in No. 16 rising up, or the thinning out of another seam overlying it.

2. No. 18 Bore hole—

	Feet.	Inches.
Reported ...	23	0
Dark clay ...	7	0
Light clay ...	5	0
Limestone ...	10	0
Sandstone ...	1	0
Conglomerate ...	6	0
Sandstone ...	9	0
Conglomerate ...	1	0
Sandstone ...	2	0
Loose gravel ...	2	6
	66	6

After working for two days and making no progress through the loose gravel, we were just going to abandon this hole when the cross cutter stuck fast: it took two 8-ton screw jacks to withdraw the rods; commenced another bore hole.

No. 20.

	Feet.	Inches.
Surface soil	11	0
Gravel	22	0
Sandstone	22	0
Light clay	1	0

3. With the two sets of $4\frac{1}{4}$-inch boring tools, I only received 100 feet of piping, 40 feet of which were drawn in No. 19 bore hole, and 60 feet in No. 18 bore hole.

4. I enclose tracing of part F and H on map, showing positions of Nos. 19 and 20 bore holes.

5. No answer up to date has been received from Calcutta regarding the analysis of coal sent to Mr. Blanford.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE AND COMMERCE.

MEMORANDUM BY DR. FORBES WATSON RELATING TO THE COLLECTIONS FROM INDIA FOR THE INTERNATIONAL EXHIBITION OF 1872.

THE accompanying instructions by Her Majesty's Commissioners for the Exhibition of 1851 refer to the second of the series of annual exhibitions, appointed to be held next year.

These instructions are of a general character, and relate mainly to the conditions under which articles of various classes will be admitted into the Exhibition, the dates of their delivery, &c. It has been thought proper to add to these general instructions some special notes on the best course of action to be adopted by India with regard to next year's Exhibition. These notes have been suggested in great measure by the experience of this year, and the adoption of the recommendations expressed in them will, it is hoped, facilitate the working of the organisation in India for the purpose of selecting the Indian collections, and, at the same time, indicate the direction in which the scheme of this year's Exhibition is to be extended, or rather the manner in which the original intention, in the arrangement of these exhibitions, may be more fully attained. This idea is, that exhibitions must become less and less mere displays, and more and more effective organisations for the attainment of practical ends, such as the representation of the characteristic features of the artistic and industrial life of a nation, the registration of the progress achieved either in science or art as applied to manufactures, and the dissemination of whatever is best in art and most fruitful in practice. To this end the collection must be systematic, and accompanied by the fullest information for study and comparison.

The collection sent this year from India does great credit to the energy of the Committees, especially as it was necessary first to create the whole machinery of organisation. But next year's work will be accomplished under better conditions for success, and the Exhibition in 1872 may be expected, therefore, to be a considerable step in advance of that of 1871.

2. The present memorandum is divided into four sections. The first treats of the measures which must be taken to assure the delivery of the Indian contributions at the prescribed periods, and the second, third, and fourth sections offer some observations on the three great divisions of Fine Arts, Manufactures, and Scientific Inventions into which all the classes of articles are to be arranged. An appendix offers, besides, some remarks on the comparative demand for the Indian art manufactures forwarded to the present Exhibition.

I.—THE DELIVERY OF THE GOODS IN LONDON.

3. It is of the utmost importance for the arrangement of the articles that they should arrive in proper time. The Commissioners fix the period for the delivery of the goods at the Exhibition at dates commencing from the 1st of March next. There is, however, a large amount of preliminary work to be done in the case of the consignments from India, and every effort should be made to ensure that they should reach the department by the 15th of

February at latest; and it is suggested that the cases should be despatched from India, each as it is ready, in order that a portion at least of them may come to hand before that date.

If proper time is wanting on this side for the unpacking, checking, selection, final labelling, and systematic arrangement of the collections, justice cannot be done to them, whatever may have been the energy of the Committees in India, and the care taken by them.

4. The way in which the packing is executed and the lists are prepared is of material consequence. It is necessary to impress the importance of some of the rules contained in the Circulars D and E issued last year by the Central Committee, but not invariably acted upon by the local Committees. The most important provisions are here repeated, with slight modifications, which, while they can hardly add materially to the work in India, will be of great convenience for the easy arrangement of the collections in London.

The first rule of moment is, that all the articles should be packed in separate cases, according to their classes, so that no objects belonging to different classes should ever be included in the same case.

The next important provision, and one which has been but seldom attended to, is that a separate list should be prepared for each case. Two copies of this list should be forwarded to London, one in the case itself, at the top of its contents, and the other sent by post,* with the letter giving notice of the despatch of the box.

Further, it is of great importance that the articles sent by each Committee should have running numbers attached to them.

If these provisions are strictly observed, they will facilitate extremely the checking of the articles during the unpacking, and prove of great use in the preparation of the catalogue.

5. At this year's Exhibition the information contained in the short explanatory notes in the lists of exhibited articles has been supplemented by the Bombay Committee, in the special memorandum by Mr. W. G. Terry on the state of pottery in the Bombay Presidency. It is very desirable that a similar course should be adopted wherever possible, and that the list of each class should be preceded by a short introductory memorandum, explaining the local character and importance of the corresponding manufacture. In the notes on the different divisions of the Exhibition which follow, the kind of information which it would be most useful to possess will be indicated.

II.—FINE ARTS.

6. The Circulars issued by Her Majesty's Commissioners, with reference to the next year's Exhibition, show that this first division, that of Fine Arts, remains entirely unchanged, consisting of the same seven classes as last year, namely,—

Class 1. Painting of all kinds, in oil, water-colour, enamel, mosaics, &c., &c.
„ 2. Sculpture, carving, chasing in marble, stone, wood, terra cotta, metal, precious stones, &c.
„ 3. Engraving, lithography, photography.
„ 4. Architectural designs, drawings, models.
„ 5. Tapestry, carpets, embroideries, shawls, lace, &c., &c.
„ 6. Designs for all kinds of decorative manufactures.
„ 7. Reproductions of ancient and medieval art.

7. The same principles, therefore, which guided the Committees in India in the selection of individual articles of this division last year will be applicable for this year. The occasion may be used to make the Exhibition more territorially complete, several localities, well represented by their art manufactures at the previous exhibitions, having been overlooked in the present display.

8. In the choice of the articles it cannot be sufficiently insisted on that the designs should, in all cases, be artistic as well as characteristically native, and that the workmanship should be as perfect as possible. It is very desirable to impress upon Indian work a character for precision and completeness which it at present often wants. This observation, of course, applies only in a restricted sense to decoration and ornamentation applied by free hand, and in which the charm consists, to a large extent, in the absence of a stiff regularity, and in the license allowed to the artist. But it does apply in all instances where the artistic form is injured by an unevenness in the sweep of a curve, or by a negligent finish of corners and edges, or where the practical fitness of an object depends on the thorough execution of joints, &c. In all such cases exactness of execution must be supposed to have been aimed at by the artist; consequently, if the execution falls very much short of the intension, the looker-on is involuntarily impressed with a sense of failure, which detracts seriously from whatever artistic merits the objects may otherwise possess. It is obvious, besides, that the employment of articles of Indian produce for actual domestic use, and not merely as show specimens, will depend on how far solidity and practical fitness have been combined with artistic excellencies.

* The boxes should be addressed to the Secretary of State for India, International Exhibition, London, and all communications relative to the Exhibition to Dr. Forbes Watson, India Office, London.

9. There is another point in connexion with the art objects which deserves special mention. Of late there has been a tendency to apply to large objects the minute ornamentation characteristic of the Bombay inlaid work or of the block-wood carving. There is nothing objectionable in this so long as this minute ornamentation is only intended to fill out the borders, fields, and panels of a bolder design, giving a character of its own to the object. If this intention were always followed, not only would the artistic sense which, for such large objects, requires something intermediate between the general outline and the minute surface ornamentation, be satisfied, but it would often also materially increase solidity and practical usefulness, especially in the Bombay carved furniture.

10. The two classes of manufacture represented this year, namely, woollens, and pottery, will only be represented next year by choice specimens, exhibited not as samples of manufacture, but solely as specimens of art: shawls, &c., on account of superior design and colouring, pottery on account of an artistic outline or graceful modelling and decoration of the surface. With regard to the other classes, it has to be observed that the class jewellery, of the second division, is restricted entirely to personal ornament. Therefore, gold and silver work destined for other purposes, such as plate, &c., will find place as objects of art. It may be added, that it would be well to have several manufactures more richly represented, such as enamels of all kinds, especially the Jeypore enamels and the so-called enamels of Purtabghur (gold on green paste); regarding the manufacture of which, moreover, our information is so imperfect.

III.—Manufactures.

A. General Observations on the five classes of Manufactures to be represented at the Exhibition, 1872.

11. There is a considerable difference between the principles which ought to guide the selection of the classes representing manufactures, and of those representing art objects. The principal consideration in the latter case is the artistic excellence, in the former it is the industrial and commercial importance. The consequence is, that whereas the artistic qualities of an object speak for themselves, an industrial or manufacturing specimen only becomes really instructive when accompanied by full information relative to its method of manufacture and its importance as an article of consumption. It is, therefore, extremely desirable that all the Committees should bear in mind that even a few well selected specimens, accompanied by an exhaustive local information, will be of more value than a much more numerous collection without the requisite information.

12. A considerable amount of information will be furnished by a judicious collection of the raw materials, tools, and machinery used in every branch of manufacture. The next step is to possess a clear account of the processes followed in the production of the articles. Particular attention ought to be paid to this point. The accounts published by different persons vary considerably as a rule. Mere hear-say descriptions are of little value, because the native workmen, not unlike most manufacturers all over the world, enshroud their handicraft in mystery, and frequently guard simple and extensively known processes as great professional secrets, and often purposely deceive the inquirer. As an example of the uncertainty in which the processes of some of the best known Indian articles are enveloped, the Kooftgari work may be quoted. The description of the process sent from India explains that the work is produced by drawing the pattern with a fine steel probe on the surface of the metal to be ornamented. When the pattern is complete, the article is heated over a charcoal fire, and the gold wire is hammered into the lines traced by the probe, &c. An eyewitness, on the contrary, describes the work as done in the following manner,—the surface of the metal is roughened by tracing on it numerous lines and cross lines, on to this surface the leaf or the sheet of gold is made to adhere by pressure; the pattern is then drawn on the gold and cut out, the remaining gold being then burnished in and the whole surface polished. There are yet other descriptions of the process; and indeed they may all be employed, but only repeated ocular testimony can clear the doubts which exist on the subject. It would be, therefore, extremely desirable if each local Committee were to depute one or two of its members to inspect the processes of manufactures of the classes included in this year's Exhibition. An accumulation of such observations, if made by persons capable of observing, would, no doubt, soon clear up all the uncertainties which exist with respect to Indian manufacturing processes, and would afford a solid ground for the possible suggestion and introduction of improved methods.

13. The preceding information bears on the technical points. Not less important is statistical information on the state of the various Indian industries. No doubt, in most cases, no accurate numbers are obtainable, but certainly a Committee consisting of the best informed men of the district will be able to give some approximate idea of the number of people engaged in a special trade, and whether it is progressive, stationary, or retrograding. Our present information bears principally on the few places which have become the seats of a characteristic manufacture, but very little is known concerning the local conditions of the usual trades which work to satisfy the wants of the masses of the people.

14. Besides all this special information, there are yet other points bearing more on general economical questions, but of great importance for marking the stage of industrial development in India. The progress of a trade depends on the degree in which mechanical appliances are used, in which the motive powers furnished by nature are utilised, and the division of labour introduced. But we know that in India, the mechanical appliances are, as a rule, of the very simplest character, that the use of natural motive powers are very restricted, and that the division of labour among the different kinds of skilled workmen only exists in its rudiments. Thus, for instance, the dyers are separated from the weavers; in jewellery, the lapidaries to some extent are separated from the metal-workers, &c. Still, it will be interesting to mark the progress in all other respects, if there is any. There are, too, other points of a more general character bearing on the organisation of trade, which have excited, as a rule, less interest, and about which the information possessed is mostly of a very vague description; such as, whether a branch of trade is merely of a domestic character, pursued by the members of a family for their own private consumption, as is the case with many beautiful fabrics and embroideries; or whether the articles are produced by skilled artisans for a limited local consumption; or are made for the general market; and, finally, whether they are sold directly by the manufacturer or first pass through the hands of a merchant.

15. There are, again, numerous differences with regard to the very important question of who furnishes the capital requisite for the production. In many instances, persons wishing to have jewellery or gold and silver work made, purchase the precious metals themselves, take a workman into the house, and have the articles manufactured under their own eyes. This is an instance in which the immediate consumer furnishes the capital. The position of the workman would be very precarious with such an arrangement, did he not, as a rule, belong to the regular village establishment, and often have some agricultural occupation to fall back upon whenever he was not occupied in his own craft. A very different example of a similar relation is frequently to be met with in the former history of India, when at the courts of the emperors, kings, and viceroys there were workshops organised to provide for the large wants of an extensive household, and for the great consumption of precious and high class goods occasioned by the custom of giving presents. It would be interesting to note to what extent such a system has maintained itself in certain parts of India. The case is different when, as in the larger towns, the workman purchases his own raw materials and exposes the produce of his skill for sale in the bazaar, or carries a certain stock to dispose of at a fair, &c. In a few principal places, instances may be found of the trade being carried on with a larger capital, a certain number of workmen being engaged in workshops, and a certain stock kept in hand. Finally, the practice may be found to exist of merchants employing a number of independent workmen, each working for himself, receiving advances from the merchant, and delivering the goods at fixed prices. All these latter instances are examples of a trade carried on for a general market, and it is of moment to have some idea of the importance of such a trade when compared with the domestic and entirely local industry.

16. Another point of interest is, whether there are towns and trades where the ancient guilds (different from mere caste associations) have maintained themselves. Buchanan states that in towns like Patna and Gayah, under the Mahomedan Government, the artisans of the same trade were united into guilds mostly possessing hereditary headmen with a certain power over all the members, and representing them in face of the authorities, and on all occasions of general interest to the guild. Under the British rule, the various powers and obligations uniting the guild were not legally enforced, and most of them either disappeared or lost their vitality. It would be desirable to know how far such guilds or corporations still exist, and how far they may be made instruments of progress.

It is not too much to hope, that some of the questions here suggested will be dealt with in special memoranda introductory to the lists of the different classes of articles exhibited by each province. Such information has a real value the more it is local and special, and has come under the eye of the members of the Committees.

B. Cotton and Cotton Fabrics.

17. This class comprises articles of the utmost importance to India, and, no doubt, every endeavour will be made to have it worthily represented. It is superfluous to make any remarks on the great importance to India of the trade in the raw article, and even the Indian manufactures in cotton, although greatly diminished by English competition, probably still occupy several millions of weavers.

18. With regard to raw cotton the information sent with the samples ought to be as exhaustive as possible. It should state the kind of seed used, the soil on which it is grown, and whether manure or irrigation has been used, and what is the yield per acre. The samples from the various Government farms will show the degree of success attained in the most recent endeavours to acclimatise foreign varieties, to improve by selection the native seed, or to trace the influence of artificial manure and irrigation.

19. Of the machinary used in cleaning and preparing the cotton, models or specimens should be forwarded only in the case of new inventions and appliances not known in England. Statistics, however, showing the extent of their employment would be very interesting.

20. The spinning factories established in India ought to be represented as completely as possible, and statistics should be given with regard to the quantity of cotton consumed, and the number of spindles and of hands employed.

21. With regard to the cotton fabrics, such as the common cotton cloths, the cotton carpets, quilts, chintzes, and the ornamental sarees and longees, &c., it is desirable to keep in mind that a few well selected specimens, accompanied by full information, are of very much more value than the exhibition of a great number with only fragmentary information. The accumulation of many similar articles ought to be avoided. This applies principally to the loom made garments, such as sarees and longees, as there is great difficulty in disposing of them in London. The information sent with the fabrics ought to state whether hand or machine spun yarn has been used in its manufacture, and, in case of coloured goods, specimens of dyes and mordants should be forwarded, with an account of the processes.

22. It will be in the power of the Committees to send a memorandum on the relative consumption of Native and English goods within their district, and the principal articles to which each kind of goods is restricted. Another point of great importance is the total quantity of cotton per head used in India. There were recently communicated some experiments from the Punjab, determining the weight of the cotton clothes as used by different classes of the people. Any information of a similar kind would be of interest.

C. Jewellery.

23. The special instructions issued by Her Majesty's Commissioners with regard to the representation of jewellery at the next exhibition are subjoined therewith. There is, besides another communication under No. 17, referring especially to collection of specimens of peasant jewellery. In Europe, jewellery, as worn by the well-to-do classes, has always been considered as very closely related to the general state of high art, and it has followed the vicissitudes and fashions prevailing in the ideas about art in general. But, untouched by the various changes of the fashionable art, there were preserved, chiefly among the peasant populations, traditional shapes and designs, possessing strong characteristics of local style, developed by an adherence of centuries to their own rules of composition. In that respect, what is true of the peasant jewellery in Europe is true of all purely native jewellery in India, all being executed in the traditional characteristic local style. It is, therefore, a collection of all characteristic native designs, without distinction of the classes by which they are worn, which Her Majesty's Commissioners desire to have. For this purpose they are willing to devote a certain sum for purchases to be effected in the various provinces of India. Independently of that, the collections sent from India ought to be numerous enough to allow of the preparation of several sets of characteristic Indian ornaments which will be required here by such places, for instance, as Birmingham, which has already, in connexion with the operations of this Department, commenced the establishment of a full collection of specimens of Indian art manufactures.

24. The list of trades which is given in the special instructions of the Commissioners is only suggestive, and whilst most of the minute subdivisions do not apply to India, trades in several widely employed Indian materials are not mentioned. But of course everything in the shape of personal ornament, in whatever material, ought to be included, such as articles in ivory, corals, horn, tortoise, &c., as well as, for instance, glass bangles and Dacca shell bracelets. It will be especially interesting to have the imitative jewellery well represented, as well as the ornaments executed in the baser metals, such as bell metal, brass, pewter, tin, &c., and even rough attempts at ornamentation in clay, &c. With regard to shape and design, care should be taken to select only purely native designs, or such spontaneous adoptions of foreign modes as have become thoroughly naturalized.

25. In order to make patent the great profusion in which jewellery is worn in India, it would be well to have the ornaments, when possible, arranged in sets, each representing what is destined to adorn fully one person. A good explanation of the names of the articles and uses to which each of them is put will be indispensable, and, in addition, it would be desirable to possess models representing the fashion of wearing the various ornaments, and accurate paintings or photographs of persons decked with jewels. Photography might also be employed to have represented in the Exhibition such private or family jewels as could not well be sent to England.

26. The collections forwarded from various parts of India will no doubt show local peculiarities and differences. But perhaps quite as striking differences can be found in each individual locality, certain characteristic shapes being adopted by the Mahomedans, others by the Hindoos, others by the aborigines, while castes, sects, and the different Hindoo nationalities have each their peculiar ornaments. The class of people, therefore, for which any ornament is destined should be mentioned wherever it is possible.

27. The great national importance of the trades working in precious metals is apparent from the recent census taken in the North-Western Provinces and in the Punjab. In the North-Western Provinces, the number of gold and silver smiths returned amounts to 135,515. As this includes the families, it will correspond, according to the usual Indian proportion, to about

40,000 adult males occupied in this craft. In the Punjab the number is returned at 63,651. In these two provinces, therefore, the number of gold and silver smiths is about 100,000 adult workers. If the remainder of India were provided in about the same proportion, we should obtain for the whole of this country something between 300,000 to 400,000 working gold or silver smiths, whose chief occupation would consist in the manufacture of personal ornaments. These numbers indicate the probable great economical importance of the branch of industry which is the subject of the present memorandum, and lead to the inquiry as to what proportion of the precious metals of India is being yearly converted into personal ornaments, and thus put into the "great Indian savings bank," as it has been called. These numbers are, however, subject to large reductions; the vast majority of the goldsmiths being probably only the members of the regular village establishments, and only occasionally occupied in their trade. The number of skilled workmen occupied at the centres of what may be called the manufacture of jewellery in precious metals, such as Delhi, Trichinopoly, &c., will be proportionately very small. In the Punjab enumeration, for example, there are returned for more than 63,000 goldsmiths only 777 jewellers, who are probably skilled workmen, working in precious metals and stones at the principal seats of industry at Delhi and Umritsur. Information with regard to the distinction of local production and real manufacturing production will be most useful. The relation subsisting between the amount of metallic currency in India and the quantity of precious metals yearly withdrawn from the circulation by their conversion into ornaments has been often debated. One opinion of much interest, and about which some of the Committees may be able to offer some remarks or criticisms, is that expressed by Colonel W. Nassau Lees (in his work on the Drain of Silver to the East, 1864, page 10,) that the amount of silver converted into ornaments is not nearly so considerable as is usually supposed. The metal by far most preferred by the richer classes is gold; and, on the other side, it is erroneous to suppose that the thick rings and anklets of white metal which the poor and labouring classes of women in India wear, and which they delight to surround with a fringe of tinkling bells, are silver. This last point, no doubt, has only a remote relation to jewellery or to manufacture, but it shows the bearing which the manufacture may have on the general economic condition of India.

D.—Musical Instruments of all kinds.

28. The objects exhibited in this class will probably be chiefly of an ethnological interest only. However artistically decorated, they will bear no comparison in musical qualities with European instruments. Nor can the trade in them be of any great national importance, as their use seems principally restricted to the professional musicians. The great merit of many of those instruments usually consists in the fine shape given to them, and in the fine carvings and inlay with which they are ornamented. These qualities will assure their being sometimes exhibited in the Fine Arts division as specimens of decorative work; but in the manufacturing division, where technical excellence holds the first place, their merit will not be high. It would seem, therefore, advisable to avoid sending a large collection of instruments from many parts of India. A full series, collected in three or four principal places, will be quite sufficient to show the general character of these instruments. For instance, a collection made at Benares or at Moorshedabad would probably do for the whole of Northern India; one made at Trichinopoly and Hyderabad, or any similar places, would answer for Southern India, while the characteristic instruments of the Burmese may be specially represented.

E.—Acoustic Apparatus and Experiments.

29. This class will be exceedingly restricted. Scientific instruments there probably will be none, and all the practical acoustic instruments within the apparent meaning of this class are ear-trumpets, speaking tubes, and different acoustic signals, with, possibly, bells and gongs. These last will probably be the only kind of articles which may be forwarded from India to this class.

F.—Paper, Stationery and Printing.

30. Care should be taken in connection with this class to have a full series of papers prepared from different raw materials. At the previous Exhibitions, notably at that of 1862, there were interesting examples of paper made from *Daphne cannabina*, from Nepaul; from *Hibiscus cannabina*, from Lucknow; from *Calstropis gigantea* (Bengal); and from many other fibre yielding plants. It will be interesting to send with the sample of paper, whenever possible, the raw material from which it is produced, together with an account of the method employed to reduce the fibres to a pulp, and the methods of bleaching and sizing the paper, in which latter respects most of the samples of Native paper seem defective. If in some establishments, as in certain of the jails, the manufacture is carried only so far as the production of half stuff, then they may exhibit their products only up to this stage, it being nowise contrary to the rules of the Exhibition to show the manufacture in its unfinished state, provided it is an industrial speciality.

31. The substitutes for paper, if they may be so called, such as palm and plantain leaves, seem to be extensively used, and especially in Southern India. It would be desirable to obtain

some information as to the relative importance of the trade in paper and in these substitutes, and to note the different purposes to which they are both applied.

32. The sub-division "Stationery" does not call forth any remarks. It is of no great commercial importance in India, although a full collection of different writing materials will be undoubtedly characteristic.

33. The chief interest of the last division, embracing printing, engraving, lithography, will consist in the demonstration of how far European inventions and proceedings have spread in India. To show the degree of acclimatisation of all those arts, it will be desirable to know the number and localities of printing and lithographic presses established by Natives in proportion to the Government presses, and the establishments attached to different missionary and educational societies.

34. It may be remarked that it is not within the meaning of this class to represent the literary character of the books published. All specimens may be forwarded simply as specimens of technical proficiency. Therefore one volume will be sufficient to mark the typographical character of a whole series of books. Of course every difference in the typographical execution, and every different language and alphabet, must be represented separately. The great development given to the vernacular literature, and to the public press throughout India, must have created a large market for paper. It would be desirable, therefore, to state with every specimen of printing and lithography whence the paper has been obtained.

35. The old art of copying manuscripts has probably been very much restricted by the great extension of the art of printing. Nevertheless some specimens of manuscripts would be interesting, as contrasts, and, if possible, some information relative to the present importance of the copying trade would be useful, as showing the number of persons employed in it.

36. Her Majesty's Commissioners have issued a further communication on the subject of paper No. 20, and are anxious to have a full collection of the different kinds of paper in use in India, as well as to possess a collection of different specimens of printing, lithography, &c., and they are willing to devote for this purpose funds for the purchase of specimens to the extent stated.

IV.—Recent Scientific Inventions and New Discoveries.

37. Many years must pass before India will be able to contribute much, on its own strength, to such a class. At the present time, contributions may be expected only from the various European establishments and organisations in India, such as the Engineering Colleges, the Public Works Department, the Railway and Telegraph administrations. Notices should be addressed to all such bodies in order to draw their attention to the opportunity which the next Exhibition offers.

The India Museum, India Office;
August 1871.

J. FORBES WATSON.

Note referring to the Sale of Indian Articles forwarded to the Exhibition of 1871.

It would be well to bear in mind that it is difficult to sell very expensive articles, except when they are in some way especially remarkable. Comparatively cheap articles of nearly all kinds can, if well made, be sold at remunerative prices, but they must be at once characteristic, artistic, and of good workmanship.

A. *Madras.*—In the Madras list the articles seem to have been in general carefully selected. The Vizagapatam satinwood wares, with ivory fretwork, do not, however, sell well, perhaps on account of their comparatively high prices, and because they are mere transcripts of European designs.

B. *Bombay.*—It is difficult to sell the large and expensive articles of Bombay carved blackwood furniture at prices which will repay their cost and carriage; flower-stands and small articles are more easily sold, if of good design and workmanship and not varnished. In the sandalwood and inlaid work the very large desks and work-boxes, chairs, and chess-tables, are difficult to be sold, both on account of their cost and on account of the great space they occupy; moderate sized articles, glove boxes, and especially the small needle boxes, wafer boxes, and card boxes can be disposed of in considerable quantities.

The imitation jewellery sent by the Government of Bombay, and manufactured by Futteh Alli Cumrodeen, has been very much admired, and several sets could have been sold even had they been in real gold and silver. The following were some of the most admired patterns:—In tray 7, "Tulsipatyu," a necklace; tray 8, "Sankla Sindeshai," anklets; "Sankla mogracha," anklets, and "Randora," waist-belt; tray 10, "Prupoat," and "Kuntli," necklaces; tray 11, "Mala Shamakali," necklace, and, "Damani," forehead ornament; tray 12, "Doro," necklace worn by Marwarees, and "Hira Kunthi," necklace; tray 13, "Tharmar," necklace.

Many of the Belgaum and Gokak toys appear to be very high priced; well made European toys of a similar character can be bought at far lower prices.

The Belgaum hornwork appears not to sell well, and is also rather dear.

Cambay (and Banda) agate knife handles, if not drilled, will not sell well; the other agate articles, selected with care and if not too highly priced, will sell well. As to the textile fabrics, the remark previously made regarding highly priced goods specially applies to them. Many sarees and doputtahs have been received at such high prices as to leave little hopes of their selling.

C. *Bengal.*—The painted plaster casts of fruits (with bases) from the Calcutta School of Art do not seem likely to sell, and are too dear.

The six ivory carvings from Moorshedabad (valued at £50) will not sell, mainly on account of their being copies of European works. The price also is excessive.

D. *North-Western Provinces.*—A great many objects were not priced. Some of the clay models of fruit are much too dear to sell (*e. g.*, 24 walnuts from Agra, value Rs. 22).

The brass articles plated with tin (especially the bowls and covers from Moradabad) are much admired and sell readily, but no information has been received regarding their cost in India.

If packed with great care, a few of the good soap-stone models of the Taj, which are made at Agra, would probably sell.

E. *Punjab List.*—The Kooftgari work sells well, especially flat pieces, such as shields, trays, &c., but not the copies of European back-comb ornaments and waist-belt buckles, some of which, as forwarded to the present Exhibition, are of very inferior workmanship.*

The prices of the Cashmere goods have not been received, it is therefore difficult to judge whether they can realize remunerative prices, but the silver ware and papier-mâché are very much admired.

Great enquiries are made for Rampore chudders (especially the grey), and for moderately priced chogas.

F. *Oudh.*—The Lucknow silver surahis, &c., of all sizes, are very much admired, and can be sold readily.

G. *Central Provinces.*—The silver personal ornaments from Nagpore are much admired. The prices in this list were marked in English money, which may give rise to some confusion, as in all the other lists they were in Native money, which should be given in all cases.

I. *Hyderabad List.*—There is a great demand for Bidree ware. The painted leather writing mats manufactured at Indore are much admired.

M. *Sind List.*—The Sind painted boxes sell readily.

No. I.

LONDON INTERNATIONAL EXHIBITION OF 1872.

BEING THE SECOND OF THE SERIES

OF ANNUAL INTERNATIONAL EXHIBITIONS OF SELECTED WORKS OF FINE ART (INCLUDING MUSIC), INDUSTRIAL ART, AND RECENT SCIENTIFIC INVENTIONS AND DISCOVERIES.

UNDER THE DIRECTION OF

HER MAJESTY'S COMMISSIONERS FOR THE EXHIBITION OF 1851.

List of Her Majesty's Commissioners.

HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G., PRESIDENT.

HIS ROYAL HIGHNESS THE PRINCE CHRISTIAN, K. G.
HIS SERENE HIGHNESS THE PRINCE OF TECK, G. C. B.
THE MARQUIS OF RIPON, K. G.
THE DUKE OF BUCCLEUCH, K. G.
THE DUKE OF BUCKINGHAM AND CHANDOS.
THE EARL OF DERBY.
THE EARL GRANVILLE, K. G.
THE EARL RUSSELL, K. G.
THE LORD PORTMAN.
THE LORD OVERSTONE.
THE RIGHT HON. W. E. GLADSTONE, M. P.
THE RIGHT HON. BENJAMIN DISRAELI, M. P.
THE RIGHT HON. ROBERT LOWE, M. P.
THE RIGHT HON. SIR STAFFORD H. NORTHCOTE, BART., C. B., M. P.
THE RIGHT HON. H. A. BRUCE, M. P.
THE RIGHT HON. CHICHESTER S. FORTESCUE, M. P., or President of the Board of Trade for the time being.
THE RIGHT HON. W. E. FORSTER, M. P., or Vice-President of the Committee of Council on Education for the time being.
THE RIGHT HON. SIR ALEXANDER Y. SPEARMAN, BART.
THE RIGHT HON. A. S. AYRTON, M. P., or First Commissioner of Her Majesty's Works for the time being.
SIR CHARLES LYELL, BART.
SIR RODERICK I. MURCHISON, BART., K. C. B.
SIR THOMAS BAZLEY, BART., M. P.
MAJOR-GENERAL SIR T. M. BIDDULPH, K. C. B.
SIR FRANCIS GRANT, P. R. A.
SIR FRANCIS R. SANDFORD.
SIR WILLIAM TITE, M. P.
THOMAS BARING, ESQ., M. P.
ALEXANDER J. B. BERESFORD-HOPE, ESQ., M. P.
EDGAR A. BOWRING, ESQ., C. B., M. P.
THOMAS FAIRBAIRN, ESQ.
THOMAS FIELD GIBSON, ESQ.
DR. LYON PLAYFAIR, C. B., M. P.
COLONEL HENRY F. PONSONBY.
JOSEPH PRESTWICH, ESQ., F. R. S., or President of the Geological Society for the time being.
HENRY THRING, ESQ.
CHARLES B. VIGNOLES, ESQ., F. R. S., or President of the Institution of Civil Engineers for the time being.

Secretary, MAJOR-GENERAL HENRY Y. D. SCOTT, C. B.

Clerk, L. C. SAYLES, ESQ.

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* With regard to Kooftgari work, care should be taken never to gum labels on the front side of it, as an indelible spot is thereby caused.

General Purposes Committee, appointed to carry out the Series of Annual International Exhibitions.

THE MARQUIS OF RIPON, K. G., *Chairman.*
H. R. H. THE PRINCE CHRISTIAN, K. G.
H. S. H. THE PRINCE OF TECK, G. C. B.
THE MARQUIS OF LANSDOWNE.
THE EARL GRANVILLE, K. G.
THE LORD NORTHBROOK.
THE RIGHT HON. SIR STAFFORD H. NORTHCOTE, BART., C. B., M. P.
THE RIGHT HON. HENRY A. BRUCE, M. P.
THE RIGHT HON. WILLIAM E. FORSTER, M. P.
SIR FRANCIS R. SANDFORD.
EDGAR A. BOWRING, ESQ., C. B., M. P.
HENRY COLE, ESQ., C. B.
THOMAS F. GIBSON, ESQ.
DR. LYON PLAYFAIR, C. B., M. P.
COLONEL HENRY F. PONSONBY.
HENRY THRING, ESQ.

Clerk, T. A. WRIGHT, ESQ.

GENERAL RULES AND REGULATIONS.

A.

Her Majesty's Commissioners for the Exhibition of 1851 announce that the Second of the Series of Annual International Exhibitions of Selected Works of Fine Art (including Music), Industrial Art, and Recent Scientific Inventions and Discoveries, will be opened at South Kensington, London, on Wednesday, the 1st May 1872, and closed on Monday, the 30th September 1872.

B.

These Exhibitions will take place in the permanent buildings erected for the purpose, adjoining the Royal Horticultural Gardens, and in the Royal Albert Hall.

Each Annual Exhibition will consist of three Divisions :—

DIVISION I.—FINE ARTS.
„ II.—MANUFACTURES.
„ III.—RECENT SCIENTIFIC INVENTIONS AND NEW DISCOVERIES.

Divisions I and III will form part of each Annual Exhibition. The classes of manufactures included in Division II will vary from year to year.

C.

The productions of all nations will be admitted, subject to their approval by competent judges as being of sufficient excellence to be worthy of exhibition, and provided they have not been exhibited in the previous International Exhibition.

D.

The Exhibition for 1872 will consist of the following Classes. For each Class a separate Committee of Selection will be appointed.

DIVISION I.—FINE ARTS. FINE ARTS APPLIED OR NOT APPLIED TO WORKS OF UTILITY EXECUTED SINCE 1862.

Class 1. Painting of all kinds, in Oil, Water Colours, Distemper, Wax, Enamel, and on Glass, Porcelain, Mosaics, &c.
„ 2. Sculpture, Modelling, Carving and Chasing in Marble Stone, Wood, Terra-Cotta, Metal, Ivory, Glass, Precious Stones, and any other materials.
„ 3. Engraving, Lithography, Photography as a Fine Art, executed in the preceding twelve months.
„ 4. Architectural Designs and Drawings, Photographs of executed Buildings, Studies or Restorations of Existing Buildings, and Models.
„ 5. Tapestries, Carpets, Embroideries, Shawls, Lace, &c., shown not as manufactures, but for the Fine Art of their design in form or colour.
„ 6. Designs for all kinds of Decorative Manufactures.
„ 7. Reproductions, *i. e.*, exact copies of Ancient or Mediæval Pictures painted before A.D. 1550. Reproductions of Mosaics and Enamels; Copies in Plaster and Fictile Ivory. Electrotypes of Ancient Works of Art, &c.

DIVISION II.—MANUFACTURES.

Class 8. Cotton and Cotton Fabrics.
„ 9. Jewellery, *i. e.*, Articles worn as Personal Ornaments made of Precious Metals, Precious Stones, or their imitations, but not Goldsmiths' and Silversmiths' Work, which will be exhibited in 1876, or Watches which will be exhibited in 1875.

Class 10. Musical Instruments of all kinds.
„ 11. Acoustic Apparatus and Experiments.
„ 12. Paper, Stationery and Printing—
a. Paper, Card, and Millboard.
b. Stationery, Account Books, &c.
c. Letterpress, Plate, and all other modes of Printing.

Raw materials, Machinery and Processes used in the production of all the several Classes of Manufactures mentioned above.

Detailed Rules and Lists of the separate Trades engaged in the production of Objects of Manufacture will be issued.

DIVISION III.—RECENT SCIENTIFIC INVENTIONS AND NEW DISCOVERIES OF ALL KINDS.

E.

All objects submitted for this Exhibition must have been produced since 1862.

F.

In the Divisions of Manufactures and Recent Scientific Inventions and Discoveries producers can send only one specimen of each kind of object they produce, such objects being distinguished by novelty or excellence.

G.

The arrangement of the objects will be strictly according to Classes, and not, as in former International Exhibitions, according to Nationalities.

H.

Foreign Governments which desire to have space guaranteed for special and selected objects can obtain such a guarantee upon making application before the 1st October 1871.—(*See* Special Rules.)

I.

Objects produced in the United Kingdom, as well as those objects produced in Foreign Countries, for which space has not been guaranteed, must be sent direct to the Building for the inspection and approval of judges appointed for the purpose. All objects must be delivered at the proper places in the Building, which will be hereafter advertised, and into the care of the appointed officers, free of all charges for carriage, &c., unpacked, labelled and ready for immediate exhibition.

J.

No rent will be charged for space. Her Majesty's Commissioners will provide glass cases, stands, and fittings, steam and water power, and general shafting, free of cost to the Exhibitors, if their requirements in these respects be notified to Her Majesty's Commissioners before the 1st of January 1872, and the Commissioners will carry out the arrangement of the objects by their own officers, except in regard to Machinery, and to any special cases requiring skilled assistance, which must be provided by the Exhibitor.

K.

Her Majesty's Commissioners will take the greatest possible care of all objects, but they will not hold themselves responsible for loss or damage of any kind.

L.

Prices should be attached to all works of Art, and retail prices to all other objects intended for sale at the close of the Exhibition. Agents will be appointed to attend to the interest of Exhibitors.

M.

Every object belonging to Divisions II and III must be accompanied by a label, stating the name and address of the Exhibitor, the special reasons, such as excellence, novelty, cheapness, &c., why it is offered for exhibition, and the retail price at which the public can obtain it.

N.

The days appointed for receiving each class of objects are as follows :—

On Friday,	1	March,	MACHINERY AND RAW MATERIALS.
„ Saturday,	2	„	RECENT SCIENTIFIC INVENTIONS AND DISCOVERIES.
„ Monday,	4	„	COTTON.
„ Tuesday,	5	„	ACOUSTIC APPARATUS.
„ Wednesday,	6	„	PAPER, STATIONERY AND PRINTING.
„ Thursday,	7	„	PAINTING IN OIL AND IN WATER COLOURS.
„ Friday,	8	„	„ „ „ „

On Saturday,	9	March,	REPRODUCTIONS OF PICTURES, MOSAICS, ENAMELS, &c.
„ Monday,	11	„	ARCHITECTURAL DESIGNS, DRAWINGS AND MODELS.
„ Tuesday,	12	„	TAPESTRIES, CARPETS, EMBROIDERIES, &c.
„ Wednesday,	13	„	ENGRAVING, LITHOGRAPHY, PHOTOGRAPHY AS FINE ARTS.
„ Thursday,	14	„	DESIGNS FOR ALL KINDS OF DECORATIVE MANUFACTURES.
„ Friday,	15	„	FURNITURE AND ALL DECORATIVE WORKS.
„ Monday,	18	„	STAINED GLASS.
„ Monday,	25	„	MUSICAL INSTRUMENTS.
„ Wednesday,	27	„	SCULPTURE.
„ Tuesday,	9	April,	JEWELLERY, WHICH MUST BE BROUGHT IN SMALL CASES TO BE PREVIOUSLY OBTAINED FROM THE COMMISSIONERS.

To enable the arrangements to be carried into effect, strict punctuality will be required in the delivery of all objects, both Foreign and British. Objects presented after the days appointed for their reception cannot be admitted.

O

Objects not accepted for exhibition must be removed according to the notices which will be given. Objects exhibited cannot be removed until the close of the Exhibition.

P

Reports of each class of objects will be prepared and printed immediately after the opening, and will be published as soon as possible after the 1st June 1872. Each Foreign Country may adopt and publish the reports in its own language, and, if desired, the expression of its agreement or disagreement with the reports may be inserted in the English Reports.

Q

Prizes will not be awarded, but a certificate of his having obtained the distinction of admission to the Exhibition will be given to each Exhibitor.

R.

A Catalogue will be published in the English language, but every Foreign Country will be free to publish a Catalogue in its own language if it thinks fit.

S.

The present rules apply to the Exhibition of 1872, and are subject to revision in future years. All persons contributing to these Exhibitions shall be considered thereby to render themselves subject to such Rules and Regulations as Her Majesty's Commissioners may, from time to time, lay down for the conduct of these Exhibitions.

MUSICAL ARRANGEMENTS.

Her Majesty's Commissioners will appoint a Committee to select for performance in the Royal Albert Hall new compositions of merit which may have been published before the 1st March 1872.

SUPPLEMENTARY COURTS.

Foreign Governments may also erect, subject to the regulations laid down by Her Majesty's Commissioners, supplementary buildings, with the object of giving additional space to the Exhibitors selected for admission into the Annual International Exhibitions, but these buildings are only to be used for the display of objects corresponding with those prescribed for each particular year.

HENRY Y. D. SCOTT, MAJOR-GENERAL,

Secretary.

Office of Her Majesty's Commissioners for the Exhibition of 1851,
Upper Kensington Gore, London, W.

HORTICULTURAL EXHIBITIONS.

International Exhibitions of new and rare Plants, and of Fruits, Vegetables, Flowers and Plants showing specialities of cultivation will be held at the same time as the above Exhibition, and Special Rules for them will be issued by the Royal Horticultural Society.

ARRANGEMENTS FOR EXHIBITING MANUFACTURES IN EACH OF THE EIGHT EXHIBITIONS TO FOLLOW THAT OF 1872.

Any modifications which may be found necessary will be duly announced.

1873.

Silk and Velvet.
Steel, Cutlery and Edge Tools—
- *a.* Steel Manufactures.
- *b.* Cutlery and Edge Tools.

Surgical Instruments and Appliances.
Carriages not connected with Rail or Tram Roads.
Substances used as Food—
- *a.* Agricultural Products.
- *b.* Drysaltery, Grocery, Preparations of Food.
- *c.* Wine, Spirits, Beer and other Drinks, and Tobacco.
- *d.* Implements for drinking, and use of Tobacco of all kinds.

Cooking and its Science.
Machinery for the Group.
Raw Materials used for all the above-mentioned objects.

1874.

Lace, Hand and Machine made.
Civil Engineering, Architectural, and Building Contrivances and tests—
- *a.* Civil Engineering, and Building Construction.
- *b.* Sanitary Apparatus, and Constructions.
- *c.* Cement and Plaster Works, &c.

Leather, including Saddlery and Harness—
- *a.* Leather and Manufactures of Leather.
- *b.* Saddlery, Harness.

Artificial Illumination by all methods, Gas and its Manufacture.
Bookbinding of all kinds.
Machinery in general for the Group.
Raw Materials used for all the above-mentioned objects.

1875.

Woven, Spun, Felted, and Laid Fabrics (when shown as specimens of Printing or Dyeing).
Horological Instruments.
Brass and Copper Manufactures.
Hydraulics and Experiments. Supply of Water.
Machinery in general for the Group.
Raw Materials used for all the above-mentioned objects.

1876.

Works in Precious Metals and their imitations.
Photographic Apparatus and Photography.
Skins, Furs, Feathers and Hair.
Agricultural Machinery and results.
Philosophical Instruments, and Processes depending upon their use.
Uses of Electricity.
Machinery in general for the Group.
Raw Materials used for all the above-mentioned objects.

1877.

Furniture and Upholstery, including Paper-hangings and Papier-Mâché.
- *a.* Furniture and Upholstery.
- *b.* Paper Hangings and General Decoration.

Health, Manufactures, &c., promoting, with Experiments.
Machinery in general for the Group.
Raw Materials used for all the above-mentioned objects.

1878.

Tapestry, Emboridery and Needlework.
Glass.
- *a.* Stained Glass used in Buildings.
- *b.* Glass for Household purposes.

Military Engineering, Armour and Accoutrements, Ambulances, Ordnance and Small Arms.
- *a.* Clothing and Accoutrements.
- *b.* Tents, Camp Equipages, and Military Engineering.
- *c.* Arms, Ordnance, and Ammunition.

Naval Architecture—Ships' Tackle.
- *a.* Ships for purposes of War and Commerce.
- *b.* Boats, Barges, and Vessels for Commerce, Amusement, &c.
- *c.* Ships' Tackle and Rigging. Additional.
- *d.* Clothing for the Navy.

Heating and Combustion, with Experiments.
Machinery in general for the Group.
Raw Materials used for all the above-mentioned objects.

1879.

Matting of all kinds, Straw Manufactures.
Flax and Hemp.
Iron and General Hardware.
- *a.* Iron Manufactures.
- *b.* Tin, Lead, Zinc, Pewter, and general Brazing.

Dressing Cases, Travelling Cases, &c.
Horticultural Machinery and Products.
Uses of Magnetism.
Machinery in general for the Group.
Raw Materials used for all the above-mentioned objects.

1880.

Chemical Substances and Products, and Experiments, Pharmaceutical Processes.
- *a.* Chemical Products.
- *b.* Medical and Pharmaceutical Products and Processes.
- *c.* Oils, Fats, Wax.

Articles of Clothing.
- *a.* Hats and Caps.
- *b.* Bonnets and General Millinery.
- *c.* Hosiery, Gloves, and Clothing in general.
- *d.* Boots and Shoes.

Railway Plant, including Locomotive Engines and Carriages.
Machinery in general for the Group.
Raw materials used for all the above mentioned objects.

GOVERNMENT OF INDIA.

ABSTRACT OF THE PROCEEDINGS OF THE COUNCIL OF THE GOVERNOR GENERAL OF INDIA, ASSEMBLED FOR THE PURPOSE OF MAKING LAWS AND REGULATIONS UNDER THE PROVISIONS OF THE ACT OF PARLIAMENT 24 & 25 VIC., CAP. 67.

The Council met at Government House on Friday, the 8th December 1871.

PRESENT:

His Excellency the Viceroy and Governor General of India, K. P., G.M.S.I., *presiding*.
The Hon'ble John Strachey.
The Hon'ble J. Fitzjames Stephen, Q. C.
The Hon'ble B. H. Ellis.
The Hon'ble F. R. Cockerell.
The Hon'ble J. F. D. Inglis.
The Hon'ble W. Robinson, C. S. I.
The Hon'ble F. S. Chapman.
The Hon'ble R. Stewart.
The Hon'ble J. R. Bullen Smith.

The Hon'ble MESSRS. CHAPMAN, STEWART and BULLEN SMITH took the oath of allegiance, and the oath that they would faithfully discharge the duties of their office.

ADMINISTRATOR GENERAL'S ACT EXTENSION BILL.

The Hon'ble MR. STEPHEN, in moving for leave to introduce a Bill to extend the operation of Act XXIV of 1867 to certain Native States, said, the object of this Bill was to extend the operation of the Administrator General's Act to the collection of the effects of British subjects dying in Native States. The Act did not, it appeared, extend to the collection of the effects of British subjects dying in Native States. But it was obvious that, in the present state of things, this ought not to be; and he therefore moved for leave to bring in this Bill.

The Motion was put and agreed to.

SUNDRY BILLS.

The Hon'ble MR. STEPHEN also moved that the Hon'ble Messrs. Chapman, Stewart and Bullen Smith be added to the Select Committees on the following Bills:—

To define and amend the Law relating to Contracts, sale of Moveables, Indemnity and Guarantee, Bailment, Agency and Partnership.
To define and amend the Law of Evidence.
To amend the Law of Insolvency.
For regulating the procedure of the Courts of Criminal Judicature not established by Royal Charter.

Also that the Hon'ble Messrs. Inglis, Robinson and Chapman be added to the Select Committees on the following Bills:—

To legalize marriages between certain Natives of India not professing the Christian Religion.
To amend Act No. V of 1840 (concerning the Oaths and Declarations of Hindoos and Mahometans).

MR. STEPHEN proposed to take the opportunity afforded by this motion, not to raise a discussion in regard to these Bills, but to make a few observations as to the stages at which they had arrived, and in regard to certain points connected with them, to which he wished to give as much publicity as he could at the present time.

The first Bill, to the Committee upon which Hon'ble Members were to be added, was the Contract Bill. The state of things in regard to this Bill was as follows:—The Bill had been before the Council, as the Council was probably aware, for between four and five years. It had been referred for the opinion of the persons most competent to give an opinion on the subject, throughout India. Matters connected with it had been discussed with the Secretary of State; it had been carefully considered in all its details by the Committee, which at one time consisted of nearly every Member of the Council; and, finally, a reference was made to the Secretary of State upon certain points connected with the Bill, as to which there was difference of opinion, in the Spring of the year 1870. On the 23rd of February 1871, a despatch was addressed by the Secretary of State to the Government of India in the Legislative Department, which arrived here in due course, shortly before the Government left Calcutta for Simla last Spring. After referring to certain amendments which were proposed by the Select Committee, upon which difference of opinion had arisen between the Government of India and the Local Governments, the despatch concluded thus:—

"I consider on the whole I shall best consult the interests of the public by leaving the question of their adoption or modification to the decision of Your Excellency in Council. Under these circumstances I trust that a contract law for India will be enacted at an early date."

The intimation contained in the concluding words of this Despatch amounted to an expression of the Secretary of State's wish that the Contract Law should be taken up and disposed of as early as possible. The delay which had occurred since the receipt of that Despatch would be explained by the reply to it which the Government of India had sent to the Secretary of State, and in which they stated that they did not wish to dispose of a matter of such importance, applying to the whole country, except at Calcutta; but that, on the return of the Government to the Presidency, the Bill would be proceeded with forthwith. The opportunity afforded by that delay had been taken to introduce some amendments, principally in matters of expression and arrangement, and also to add to the Bill one or two points. He hoped these additional matters might be readily disposed of by the Committee, and that the Bill might be afterwards passed into law, if the Council thought fit, in a very short time.

The next Bill, to which he had to refer, was the Evidence Bill. He need not say anything more about it, than that it was under the consideration of the Committee. He, however, wished to make one or two remarks. In the first place, although the matter had excited a great deal of public attention and much discussion, and although the Bill had been sent for the opinion of the Local Governments some time in June last, with a request that their opinion on the subject might be forwarded in the course of the Autumn, many of the Local Governments had not yet sent in any opinions whatever on the subject. He earnestly hoped that these opinions might be received in order that they might be fully considered. Some memorials had been received on the subject from individuals, especially from certain members of the Bar. He did not wish to discuss them. But he wished to say that he thought that the opinion of some persons, that the Council in general, and MR. STEPHEN in particular, were animated by some feeling of hostility against the Bar, was perfectly unfounded, and was almost as unnatural and absurd as that His Lordship, the President, should be accused of a strong prejudice against Irishmen, or that any other of MR. STEPHEN'S colleagues should be accused of prejudice and dislike against the Civil Service. He was the last person in British India who had any right or any wish to make an attack upon the members of the Bar. Everything that had been said upon the subject of this Bill would receive most earnest and careful attention in a perfectly fair and friendly spirit, without the slightest notion of making any attack upon the independence or position generally of the honourable profession in question.

The next Bill upon which he had a word to say was the Insolvency Bill. This was a Bill upon which the Government had received a considerable mass of opinions from various persons, and very grave questions indeed had been raised regarding it. The gravest of those questions was whether the Bill ought to extend beyond the Presidency towns. Considerable doubts had been intimated, as to its suitability even to the Presidency towns, by a considerable number of persons whose opinions were entitled to great respect, although the balance of opinion was the other way. He might state, with regard to this Bill, that he did not think it was of equal general importance, or equally necessary to be disposed of, with the other two Bills which he had mentioned. However, it was in a forward state, and would be considered, but it was very possible that the Committee might not proceed with it at present. At all events, he wished to say publicly that this Bill was in a less forward state than the others to which he had referred.

Another Bill, to which he would now refer, was the Bill for the re-enactment of the Code of Criminal Procedure. On that Bill the Committee was actively engaged, and in reference to it he had a remark to make of considerable public importance. The Committee had received a large number of opinions from the Local Governments and persons connected with the administration of justice in reference to it, and, amongst others, they had received a most important paper from the Government of Bengal. That paper contained a suggestion that European British subjects should be made to a great degree amenable to the ordinary criminal courts of the country.

The present law on the subject was this. Out of the Presidency towns, European British subjects were liable only to the jurisdiction of Justices of the Peace to an extent specially defined in the statute 53rd of Geo. III, cap. 155, and were liable only to a fine, or, in default of payment of the fine, to simple imprisonment for two months. The suggestion of the Bengal Government was, that this state of things should be altered, and that European British subjects should be rendered liable to punishment of a more severe character. Now, he should not at present express any opinion or enter in any way into a discussion upon the subject; nor did he think it necessary to trespass upon the time of the Council by reading out the whole of the despatch of the Government of Bengal upon the subject. Means would be taken to bring it to the notice of the Council and of the Local Governments. He mentioned this fact thus publicly, because it was eminently desirable that the public should not be taken by surprise in a matter of this kind; that they should be made aware of the fact that such a suggestion had been made and was under consideration; and that they should express their opinion on the subject. It was also intended to request the Local Governments specially to express their opinion on this point, and he mentioned all this, because, when he introduced the Bill now before the Committee, this was not one of the points to which he specially directed attention in his speech. It had, however, been brought before the Council by the Bengal Government, and it would be left to the Committee to consider what was to be done in the matter. As he had said, he mentioned this publicly in order to give the public at large notice that they might express their views upon the subject. There were some other points of importance which would come up for consideration, but he did not think that they were of such a character that he need refer to them on this occasion.

With regard to the next Bill, it was also one that had been a long time before the public, and he hoped it might be speedily disposed of. It was a Bill to legalize marriages between certain Natives of India not professing the Christian religion. It was a Bill introduced by his predecessor, Sir H. Maine, at the end of the year 1868, three years ago. It was subsequently modified and assumed the form of a Bill to legalize marriages between members of the Bráhma Samája, whose position as to marriage occasioned the introduction of the Bill. Subsequently, objections were taken to the Bill as modified, by one of the sections into which that body was divided, who considered it would be injurious to their interests. In deference to their objections, the Bill was further considered and postponed, and since that time he was happy to say that he had been in communication with gentlemen who represented both sections of the body in question—the body called the Progressive Brahmists (he did not know whether they were properly so called) and the Adi-Bráhma Samája. He was very happy to be able to announce that, after a good deal of discussion on the subject with those bodies, the Committee had been able to devise a measure with which they expressed themselves completely satisfied, and against which, he thought, no other person would be found to take any solid objection. He hoped this Bill would be very speedily disposed of, and that the Council would be able to pass it into law. He would have to trespass upon the time of the Council at considerable length when the Report of the Committee came on for consideration, and, therefore, would not take up its time at present.

The other Bill, regarding oaths and declarations, required no remarks from him at present.

The Hon'ble MR. CHAPMAN desired to avail himself of this early opportunity to state it as his decided opinion that the revised Code of Criminal Procedure should be made applicable, without distinction, to all Courts in British India. He considered that any measure that fell short of this would be unsatisfactory and incomplete.

The Motion was put and agreed to.

INDIAN CHRISTIAN MARRIAGE BILL.

The Hon'ble MR. COCKERELL moved that the Bill to consolidate and amend the law relating to the solemnization in India of marriages of persons professing the Christian religion be referred to a Select Committee with instructions to report in two months. He said that the Bill had been already introduced and published, and at the time of its introduction he had explained the few amendments of the existing law for which it provided.

The most important of these was in regard to the certifying of marriages between Native Christians under Part V of Act V of 1865.

By that Act, if the persons intending marriage had attained the age of sixteen years in the case of the male, and thirteen years in that of the female, the marriage might be certified without any reference to the consent of parents or guardians. This was, as MR. COCKERELL thought, most justly represented to be a great hardship where the parties to such marriages were minors, and had, up to the time of the marriage, lived with or under the control of their parents or guardians.

To meet this defect in the present law, it was provided in section fifty-four of the Bill, that—

> "no marriage shall be certified under this Part when either of the parties intending to be married has not completed his or her eighteenth year, unless such consent as is mentioned in section eighteen has been given to the intended marriage, or unless the party who has not completed his or her eighteenth year is proved, to the satisfaction of the person licensed to grant certificates under section nine, to have resided apart from, and to have been independent of the control of, his or her parents or guardians."

The intention of this was to make the consent of parents or guardians an essential condition to the legal contracting of marriages between minors, in those cases in which the parents or guardians ought obviously to have a voice in the matter, without at the same time imposing the obligation of serving notices, which would be burdensome to the poorer and more uneducated classes who formed the bulk of the Native Christian community, and which it was doubtless a main object of past legislation on this matter to avoid.

The Bill was published some weeks ago, but MR. COCKERELL had not yet seen any expression of opinion as to the sufficiency of the amendment to which he had just adverted.

It would probably be necessary to invite specially the opinions of the President of the Society at whose instance this amendment was undertaken, and of some of the missionary clergymen who were best acquainted with the circumstances of the persons who were chiefly affected by it.

The Hon'ble MR. STEPHEN said he wished to make one remark with regard to this Bill, with reference to a clause which he thought it would be necessary to add to it in consequence of certain matters which had come to notice recently; and that was, that a declaration should be inserted in the Bill, making it perfectly clear and beyond all doubt that no European British subject, and no person who by his law of domicile was a monogamist, should be permitted to acquire the right to commit polygamy by any change whatever of his religious opinions. A case had occurred, in which a man had been known to become a Muhammadan obviously for the fraudulent purpose of acquiring, as MR. STEPHEN thought utterly wrongly, a right to break the most solemn contract which one human being could possibly form with another, by introducing to the wife a second woman, or a third, or a fourth for that matter, who would have a legal right to be on the same footing as the first wife. He hardly liked to trust himself to say what he thought of such conduct. It appeared to him to be a complication of bigamy, adultery, and as gross a breach of faith and contract as it was possible for a human being to commit. And he also thought that, in a moral and civilized society as this was, we ought not to allow any misconception on this point; that although we ought not to interfere with Native institutions for which we were in no way responsible; although we would faithfully and honourably administer the Native law which we found in the country, we did not on that account undervalue our own English and European law, as it applied to men who by their birth and breeding were subject to it. He could not admit, and he never would admit, that the institution of monogamy was one which depended in any degree upon a man's theological opinions. And he could not admit that an Englishman was to be allowed to escape from the obligations which he had contracted under the law of England by any change, real or pretended, in his religious opinions. He proposed, therefore, when the Bill was in Committee, to insert in it a declaration which he believed to be absolutely in accordance with the existing law, and which he believed any Court of Justice would hold if the matter were brought before it, that if a man, being a European British subject, had once contracted a binding monogamous marriage, he was not at liberty to absolve himself from the obligations of that marriage, in consequence of any change in his religious opinions.

The Motion was put and agreed to.

LOCAL EXTENT ACTS BILL.

The Hon'ble MR. COCKERELL also moved that the Hon'ble Messrs. Inglis, Robinson and Chapman be added to the Select Committee on the Bill for declaring the local extent of certain Acts passed by the Imperial Legislative Council.

The Motion was put and agreed to.

NATIVE PASSENGER SHIPS ACT AMENDMENT BILL.

The Hon'ble MR. CHAPMAN, in moving for leave to introduce a Bill to amend Act XII of 1870, the Native Passenger Ships Act, said that Chapter II of the present Act contained very stringent provisions for the protection of Native passengers; but the Law officers of Government considered these provisions applicable only to sailing vessels and not to steamers. Now, the class of people who required to be specially protected were pilgrims proceeding to Jedda and other ports in the Red Sea, *en route* to Mecca; and as it was understood to be a common practice to convey them in steamers, it was advisable to extend the provisions of the Act to this class of vessels.

The Motion was put and agreed to.

The following Select Committee was named:—

On the Bill to consolidate and amend the Law relating to the solemnization in India of marriages of persons professing the Christian religion—The Hon'ble Messrs. Stephen, Inglis, Robinson, Chapman and Bullen Smith and the Mover.

The Council adjourned to Friday, the 15th December 1871.

CALCUTTA;
The 8th December 1871.

H. S. CUNNINGHAM,
Offg. Secy. to the Council of the Govr. Genl. for making Laws and Regulations.

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SUPPLEMENT TO

The Gazette of India.

CALCUTTA, SATURDAY, DECEMBER 23, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time, containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

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GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

RAJPOOTANA RAILWAY—PROJECT FOR AGRA DISTRICT FROM AGRA TO SAMBHUR.

No. 2353—61 R, dated Simla, 15th November 1871.

OBSERVATIONS—By the Government of India, P. W. DEPT.

Read again :—

Public Works Department	No.	1678 R—G,	dated 30th October 1869.
N. W. Provinces Government	„	162 S R—C,	„ 8th June 1870.
„ „	„	239 „	„ 5th July 1870.
„ „	„	259 „	„ 15th July 1870.
„ „	„	262 „	„ 27th July 1870.
„ „	„	322 „	„ 20th September 1870.
Public Works Department	„	220 R,	„ 11th February 1871.

Read also :—

Agency, East Indian Railway,	No.	172 G,	dated 22nd March 1871.
Extract, para. 7, of Directors' letter to Agency, East Indian Railway	„	43,	„ 26th May 1871.
Government, N. W. Provinces	„	131 S R,	„ 8th March 1871.
„ „	„	236 S R,	„ 3rd April 1871.
„ „	„	217 S R—C,	„ 10th July 1871.
„ „	„	225 „	„ 12th July 1871.
„ „	„	2999	„ 30th October 1871.

OBSERVATIONS.—It having been determined by the Government of India, with the consent of Her Majesty's Government, to construct a railway from Agra by Bhurtpoor and Jeypoor

to the Sambhur Salt Lake with the immediate object of facilitating the transport to British territory of the salt so largely produced there, as well as to form an important section of a railway which should eventually traverse Rajpootana and unite with the existing railways of the Bombay Presidency, instructions were issued on the 30th October 1869 for the immediate commencement of the surveys for the preparation of a project. These were carried on during the season of 1869-70, and resulted in the submission to the Government of India, during the recess of 1870, of an excellent preliminary project, from which it was evident that the several alternative alignments and deviations throughout the route, that seemed to call for consideration, had been very carefully investigated. This project was very creditable to the Superintending Engineer, Colonel Peile, R. E., and the staff employed under his orders.

2. In the execution of the surveys, two especially important matters presented themselves for the investigation of the Engineers. These were the point of junction of the line from Delhi with that from Agra, and the general location of the line from the neighbourhood of Jeypoor to the Sambhur Lake.

3. On these points it was decided, after full consideration of the several alternative lines examined by the Engineers, that Khera (Bewai), 86 miles from Agra, is the most suitable point for the junction, and that the importance of the city of Jeypoor is such that the main line should be taken as near to it as is conveniently possible notwithstanding the steep gradient, and the detour involved by the topographical features of the ground in its vicinity. From Jeypoor it was settled that the line should be taken direct to Sambhur; but in view of the disadvantage to the through traffic and the special nature of the Sambhur trade, it was further decided that the extension line towards Ajmeer should take off about four miles east of Sambhur. This place would thus be on a branch; but this will not be a disadvantage under the circumstances, because it can be worked as the extension of the sidings that will have to be laid down on the margin of the lake for the economical handling of the salt.

4. Before proceeding further, it is desirable to place on record the reasons which prevailed with the Governor General in Council in forming these conclusions on the two points above referred to.

5. As respects the location of the line between the vicinity of Jeypoor and the Sambhur Lake, the question presented for decision chiefly turned on the expediency of placing Jeypoor and Sambhur on branches in order to save through traffic from the detour involved in the adoption of a circuitous line. Sambhur, on account of its important salt product, is an obligatory point, whether it be reached by a branch, or the main line be carried to it. Jeypoor is by far the largest city in Rajpootana, having, it is believed, 250,000 inhabitants, and it is manifestly inexpedient to leave a place of this magnitude at a distance from the railway. Owing to the peculiar topography before referred to it would be six miles from the line unless a specially abrupt deviation were made to reach it. If, therefore, the main line were not diverted to reach the city, a branch would be necessary.

6. The estimates (prepared for the broad gauge) of the proposed alternatives showed that the more direct line with branches would cost £60,000 more, and demand three additional miles of railway compared with the circuitous line; but allowing even that there would be no additional length of line to be constructed, the direct line would still be somewhat more costly owing to the difference of the country, and there would be the constant extra expense of working the branches. The transport of the salt might, however, be confined to a certain season of the year, this branch being closed for the remainder; and as respects the Jeypoor branch, it was suggested that the traffic should be worked in and out from the junction, while the through train is standing there, and, in favor of the branches, there is no doubt that the country traversed by the through line would be less desert than that immediately between Jeypoor and Sambhur, by which the circuitous line would have to be taken.

7. Jeypoor is not only a very large city, but it is the capital of the State, and between it and the surrounding districts there must of necessity be much inter-communication, which it is obviously undesirable that the railway should fail to serve to the utmost. The trade of the city is almost entirely with the east, and, in its interests, shortness of through transport to and from the west is, comparatively, of little moment. An inspection of a map, showing the boundaries of the Jeypoor State, affords no reason for the supposition that the more direct or southern line towards Sambhur would obtain more short local traffic to and from the city than is due to the towns and villages in its vicinity. The distances within the Jeypoor territory from the south-west districts of that State are in the aggregate so small that those resident at any distance from the line of railway would probably travel direct, and by one means of conveyance, to and from the city, so that the northern route, though less populous, would not, if adopted for the railway, deprive it of any serious amount of traffic.

8. The general traffic on this line must, for many years, be light, and, therefore, the first cost as well as the cost of working should be kept down to the utmost. With branches to Sambhur and Jeypoor, the through traffic would be saved, paying toll over a certain length (perhaps 10 miles) of line; but while this would benefit trade in a small degree, the general public who pay for the railway would suffer, for the construction of the branches would require an outlay which would be excluded from participation in the earnings from through traffic.

9. Considering the subject in all its bearings, the conclusion arrived at by the Governor General in Council was in favor of the northern location by which Jeypoor would be on the main line and the railway would be taken direct to Sambhur. Further, by selecting a point about four miles east of Sambhur for the bifurcation of the extension towards Ajmeer, the lead of salt towards the east would still be a minimum, while the disadvantage to through traffic would be somewhat lessened, albeit at the disadvantage of having to work a branch. As, however, the Sambhur junction will be an engine-changing station, the inconvenience and expense will be minimised.

10. Next as to the point of junction of the two districts of the railway. The various sites proposed for the junction are shown on the attached sketch. The dotted lines are those recommended by the Government, North-Western Provinces, and the Railway Officers.

11. For a through line to Agra, the lines recommended are the best, as giving a minimum mileage to be constructed, and as presenting fewer difficulties in construction. The one objection to the dotted line to Ulwar is that it does not pass close either to Buswa or Rajghur. Buswa is, however, a place of only 2,500 inhabitants, and as the line is within three miles of Rajghur with its 12,000 inhabitants, it was determined to waive this objection. The eastern or Khera junction adds five miles to the through distance to Delhi, and diminishes the distance to Agra by two miles, compared with the western or Goodha junction. It also reduces the length to be constructed by nearly nine miles. The Bundikhera junction, intermediate between the eastern and western junction, would require nearly five and half miles more of line than the Khera junction, but would decrease the distance to Delhi by nearly three miles.

12. The sketch exhibits the great detour that must be made by any line from Agra towards Jeypoor in order to serve the salt field of Bhurtpoor, which extends from the city of Bhurtpoor for 28 miles in a northerly direction, or for eight miles beyond Deig. Were the Agra line taken *vid* Deig, Rajghur would be the junction with the Delhi line, the Agra traffic would have to be carried over 22½ additional miles, and 11½ additional miles of railway would have to be constructed. To take the through line so far out of the way for the purpose of serving this salt tract did not seem expedient. A more direct line to Agra would certainly pass near to Bhurtpoor, a large city which it is of importance to bring on to the railway, and should it hereafter be found expedient, a tramway could be laid traversing the whole extent of the salt field.

13. In the face of these considerations, the Governor General in Council had no hesitation in accepting the recommendation of the local Government and Railway Officers, and in deciding on the Khera site as the most suitable for the junction in the interests of the railway generally. Its position is also convenient for an engine-changing station which it is desirable to place at a junction like this.

14. These points being settled, the general alignment was practically determined, and the only deviations from the surveyed lines that were called for were due to the adoption of a steeper ruling gradient than that ($\frac{1}{300}$) originally contemplated. The population beyond British territory is sparse, and the traffic for many years must be small. It was, therefore, decided, after examination of the longitudinal sections, to economise in this part of the undertaking by adopting a gradient of $\frac{1}{150}$ wherever it would reduce earthwork in any important degree. In this way a considerable saving in outlay became possible, while the demand on the labor market would be materially reduced,—a matter of moment considering the sparseness of the population.

15. One other point of importance required a decision, *viz.*, the location of the line in the immediate vicinity of Agra, and in connection therewith the crossing of the Jumna to unite with the East Indian Railway, and the station arrangements on both banks of the river. This question, as well as that of the location between Jeypoor and Sambhur, were reserved for the Viceroy's decision during His Excellency's visit to Rajpootana in October 1870.

16. Colonel Peile had examined two lines for the approach to the Jumna at Agra, which involved different crossings of the river. The city of Agra is on the right bank of the Jumna, which here has a course nearly north and south, and immediately below it and on the same

bank is the fort. The Military Cantonment is a short distance to the south-west of the fort and away from the river. Directing his line generally on a point between the fort and the city, so as to serve both the cantonment and city by a single station, Colonel Peile contrived by taking advantage of a ravine to bring his line up to the Tripolia (now an enclosed market and formerly a kind of outwork of the fort), situated immediately between the fort and the great mosque which is on the confines of the city, and thence to the river bank without interfering with any property of value, or involving exceptionally costly works. But the crossing of the river thus presented is 2,100 feet in length, whereas above the city a crossing can be obtained 1,260 feet in length. Accordingly, an alternative line was run from a point as convenient to the cantonment as could be obtained under the circumstances, passing round the city to this northerly crossing; and these alternatives were examined by His Excellency the Viceroy when at Agra.

17. On the one hand, there was the advantage of a much shorter bridge in a well-defined channel; on the other hand, there was an extra length of railway to be constructed and worked over, on an alignment involving heavy compensation for property, intersecting almost every road of approach to the city, and requiring the construction and maintenance of a second station for its convenience.

18. Balancing the advantages and disadvantages in point of convenience and cost, and throwing into the scale the superiority of the fort-crossing in a military point of view, it was decided by His Excellency that the line should be carried by the Tripolia to the river bank, that a station with sufficient accommodation for the passenger and local goods traffic should be built between the Tripolia and the river on the esplanade intervening between the fort and the city, and that the interchange of through traffic and other terminal arrangements should be provided for in the vicinity of the East Indian Railway station on the opposite bank. It had been previously settled by the Governor General in Council that the bridge over the Jumna should have a roadway for ordinary traffic, and it has now been decided, on further consideration of the convenience of the local traffic of this large city, that the bridge and station arrangements at the Tripolia shall admit of the East Indian Railway trains running in and out of that station. For the foundations of the piers of the bridge, three wells, each 12½ feet in diameter, to be undersunk to as great a depth as may be found practicable, will be adopted. The economic length of span indicated by such piers is about 150 feet, but the Consulting Engineer for State Railways will consider this point further, and make a definite recommendation, bearing in mind that the larger the span the more convenient will the roadway for ordinary traffic be.

19. As, in so far as the passage of the waters is concerned, a bridge of the shorter length might be adopted at either site, it is recorded here that in order to avoid the risk of deflecting the current of the river in floods, and thereby causing a possibly dangerous erosion of the bank near the Taj Mehal, it has been determined not to reduce the length of bridge at the fort-crossing by advancing the eastern abutment, but to bridge the entire width of the flood channel.

20. The points considered during His Excellency's visit to Agra being determined, it only remained to locate the line permanently throughout its course to Sambhur, and the staff accordingly entered upon this duty in November 1870 under the direction of Mr. Furnivall, who succeeded Colonel Peile on his departure on furlough. There being some apprehension of famine, extension surveys were ordered by His Excellency the Viceroy when at Ajmeer to be made between Sambhur and that place, so that in the event of such a calamity, the railway works might afford employment to the starving people at their doors. Happily this cloud passed away.

21. Early in January of this year the gauge question was settled and the narrow gauge adopted on this railway. Mr. Furnivall's project for the finally located line and on that gauge was submitted in July last, and having on examination been approved as sufficiently complete to admit of the invitation of tenders for the construction of the railway by contract on a schedule of prices, that course was decided upon.

22. Tenders were invited for the works, both by divisions and for the whole line. Nineteen tenders were received, varying in amount from about 24½ lakhs of rupees to 48 lakhs for the entire line. Only two tenders, however, were in excess of Rs. 35,33,000. In two cases the divisional tenders were promising, but on the whole the most favorable tenders were made by those who came forward for the entire line. That of Messrs Glover and Company, of Bombay, amounting to Rs. 25,44,181, was accepted on the 20th October 1871. This amount is inclusive of maintenance for two years, but is exclusive of English materials, rolling-stock and sleepers, which are to be supplied by Government. The length of line let between Agra and Sambhur is about 185 miles, and the term of the contract for construction expires on the 30th June 1874.

23. The estimates of the Engineers give a rate of about £4,000 a mile. They are somewhat excessive in the item of permanent way, telegraph, and fencing, but defective in bridging. Taking into account the preliminary expenses, the cost of establishment from the first and during construction, and of rolling-stock, there is good reason for the conclusion that the line may be completed and stocked well within £5,000 per mile.

24. The details of the projects at present calling for the orders of the Government of India have been dealt with in a separate memorandum. The question of the compensation to the Agra Cantonment Funds for the interference with the Tripolia grain market should be considered in the Military Department. It will be observed that it is not proposed to close the market, but as some of the shops must be interfered with, to build others in the immediate vicinity at an estimated cost of Rs. 8,750. A plan with explanatory memorandum should be submitted for consideration in the Military Department.

25. The plans of the station and station buildings at the Tripolia should also be submitted for approval in that department when finally got out. It is to be understood that all banks or cuttings in the vicinity of the fort shall have such slopes as not to afford cover from the fort, and the station buildings shall be of such materials as will admit of their being quickly dismantled. If these points be attended to, it is believed that there will be no objections, on the part of the military authorities, to the location of the railway and station so close to the fort.

26. It should be intimated to the Department of Agriculture, Revenue, and Commerce that of the alternative locations of the railway in the close vicinity of the Sambhur Lake, the western, as avoiding the hills of drift sand, and affording in other respects a better line, is approved, and will be adopted, unless any modification should be desired in that Department with the view of better serving the interests of the Salt Department.

27. At the stations of Jeypoor and Bhurtpoor special accommodation should be provided for the Maharajahs; or if their Highnesses should prefer it, a convenient site should be indicated on which they might erect a small bungalow, at their own expense, for their accommodation when travelling. The Viceroy and Governor General in Council is also desirous that State Saloon Carriages shall be built for their Highnesses' use, &c.

28. The estimates should now be revised with all practicable despatch and submitted for orders, as it is important that divisional and separate work sanctions should be given for purposes of audit. In the meantime a distinct sanction may be recorded for the amount of the accepted tender; but as it will not exhibit the amount for each division separately, the Superintending Engineer should report, without delay, the distribution of its amount between the several divisions.

29. The direction of the line into Ajmeer having been decided, and it having been lately ordered that the Agra District shall be extended to Nusseerabad, to which place trial sections have been run, the complete estimates for the extension from Sambhur junction to Nusseerabad should be submitted for orders as soon as ready.

30. In conclusion, the Governor General in Council desires that the satisfaction of the Government shall be recorded at the manner in which the preliminary and final projects have been, respectively, prepared by Colonel Peile and Mr. Furnivall, and the staff acting under their direction.

31. The sanction recorded in this Resolution will be registered as No. 6 A D R R of 1871-72.

ORDER.—Ordered, that this Resolution and the memorandum of orders on details be communicated to the Superintending Engineer, Agra District, Rajpootana State Railway, and to the Accountant General, Public Works Department, for information and guidance.

Ordered, also, that this Resolution be communicated to the Foreign and Financial Departments, to the Government, North-Western Provinces, and the Governor General's Agent for Rajpootana, for information; to the Agriculture, Revenue, and Commerce Department, with reference to paragraph 26; and to the Military Department, with extract paragraphs 6, 7, and 12 to 17 of Mr. Furnivall's Report on the Agra Division of the Rajpootana Railway, with reference to paragraphs 24 and 25.

Ordered also, that this Resolution be published in the *Supplement to the Gazette of India*.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

THERMOMETRICAL OBSERVATIONS TAKEN AT THE HILL STATIONS OF CHUCKRATA AND RANEEKHET.

No. 290, dated Roorkee, the 20th November 1871.

From—J. ELLIOTT, Esq., Offg. Reporter on Meteorology for the North-Western Provinces,

To—The Secretary to the Government of the North-Western Provinces.

I have the honor, in reply to your No. 4711A, dated 4th of November ultimo, in continuation of G. O. No. 4075A, dated 12th September last, to forward the averages of the thermometrical observations taken at the hill stations of Chuckrata and Raneekhet from January to October 1871. To make the returns as complete as possible, I have given fortnightly as well as monthly averages, and also included humidity returns. The last I have added because it appears to me the comparative dampness or dryness of a hill station is nearly as important a meteorological element, in a sanitary point of view, as the average temperature or the variation of temperature.

I shall be glad to include in future returns, on further instructions, humidity and rainfall returns.

I have also to add that I have written suggesting additional thermometrical and rainfall observations at both stations, and as soon as I learn from the respective officers of the Public Works Department what instruments they require to effect this, I shall supply them from the meteorological instrument depot.

Means of Thermometrical Observations taken at the Meteorological Observatory, Chuckrata, from January to October 1871.

Month.		4 A. M.			10 A. M.			4 P. M.			10 P. M.			Maximum in Sun.	Minimum in Sun.	Maximum in Shade.	Minimum in Shade.
		Dry Bulb.*	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.				
JANUARY	Mean from 1st to 15th	38·7	32·4	45·3	47·6	38·0	34·1	43·7	36·3	41·8	40·2	33·4	42·4	123·7	...	52·0	35·8
	Mean of 16th to 31st	43·8	35·6	40·7	51·3	40·4	33·6	47·2	40·5	44·1	45·5	37·8	44·3	124·2	...	57·0	40·4
	Mean of Month	41·3	34·0	43·0	49·0	39·2	33·8	45·5	38·4	43·0	42·9	35·6	43·4	124·0	...	54·5	38·1
FEBRUARY	Mean of 1st to 14th	47·1	37·4	37·6	57·6	42·2	34·7	51·7	42·5	41·5	48·8	39·8	40·0	123·3	...	60·7	44·8
	Mean of 15th to 20th	40·0	36·9	70·	47·2	42·2	63·3	45·4	41·7	86·9	40·5	34·0	78·3	127·7	...	52·0	36·5
	Mean of Month	43·5	37·1	53·8	52·4	42·2	49·0	48·6	42·1	64·2	44·7	36·9	59·1	...	...	56·3	40·6
MARCH	Mean of 1st to 15th	41·5	34·7	45·6	52·2	41·4	31·	48 9	39 3	40·3	43·6	36·4	41·6	130·5	...	56·7	39·3
	Mean of 16th to 31st	50·1	44·0	23·6	62·3	46·1	16·7	59·7	45·7	22·8	53·8	41·7	25·9	137·1	...	68·5	8·3
	Mean of Month.	45·8	39·4	34·5	57·3	43·7	23·7	54·5	42·5	31·5	48·8	39·1	33·3	133·8	...	62·7	43·9
APRIL	Mean of 1st to 15th	54·5	42·4	25·8	66·4	49·7	21·7	63·8	46·8	23·3	56·7	44·0	25·5	134·1	...	72·2	52·1
	Mean of 16th to 30th	51·7	43·3	46·0	61·7	50·2	39·9	59·3	49·4	43·9	54·0	44·6	44·0	130·6	...	68·6	48·4
	Mean of Month	53·1	42·8	35·9	64·	50·	30·8	61·0	48·1	33·6	55·3	44·3	34·7	132·6	...	70·4	50·2

* The readings of the Dry Bulb are the same as those of the Standard Thermometer.

Means of Thermometrical Observations taken at the Meteorological Observatory, Chuckrata, from January to October 1871—contd.

Month.		4 P. M.			10 A. M.			4 P. M.			10 P. M.			Maximum in Sun.	Minimum on Grass.	Maximum in Shade.	Minimum in Shade.
		Dry Bulb.	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.				
MAY	Mean of 1st to 15th	52·5	46·4	60·2	63·4	54·4	55·4	58·6	51·1	57·5	55·2	48·8	57 6	136·5	...	68·2	49·8
	Mean of 16th to 31st	58·7	52·9	66·8	65·4	59·5	69·9	66·4	60·8	65·6	60·3	55·2	65·4	126·3	...	70·5	54·3
	Mean of month	55·7	49·7	63·6	64·4	56·9	62·7	62·6	56·0	61·7	57·8	52·1	61·6	131·2	...	69·4	52·1
JUNE	Mean of 1st to 15th	61·1	59·5	90·3	66·4	64·0	87·2	66·2	63·2	83·6	62·2	60·4	89·8	135·8	...	72·9	59·6
	Mean of 16th to 30th	62·8	62·1	95·3	67·1	64·9	88·9	66·4	64·8	90·3	64·5	63·5	92·6	117·4	...	71·9	61·4
	Mean of month	62·0	60·8	92·9	66·7	64·4	87·6	66·3	64·0	87·0	63·3	61·9	91·2	126·1	...	72·4	60·5
JULY	Mean of 1st to 15th	61·8	60·5	93·9	66·4	64·2	87·6	65·8	64·2	84·4	63·2	62·0	93·2	124·6	...	71·1	60·1
	Mean of 16th to 31st	61·6	60·6	94	65·6	63·9	90·3	64·3	63·3	93·2	63·0	62·0	93·6	109·0	...	69·7	64·5
	Mean of month	61·7	60·6	93·9	66	64	89·0	65·0	63·7	88·9	63·1	62·0	93·4	116·7	...	70·4	62·4
AUGUST	Mean of 1st to 15th	61·3	60·8	94·8	65·8	64·4	91·1	64·6	63·6	93·4	62·6	62·3	95·1	112·6	...	68·6	60·5
	Mean of 16th to 30th	61·4	63·5	94·6	65·6	65·1	91·6	64·8	64·1	93·9	62·5	61·4	93·5	122·4	...	69·8	59·9
	Mean of month	61·4	62·2	94·7	65·7	64·8	91·4	64·7	63·8	93·7	62·6	61·8	94·4	117·7	...	69·3	60·2
SEPTEMBER	Mean of 1st to 15th	59·2	57·7	91·2	65·2	62·3	83·9	63·9	62·0	88·3	60·6	59·0	90·3	133·4	...	70·2	57·7
	Mean of 16th to 30th	57·9	55·8	84·8	65·4	61·2	77·3	64·2	61·6	85·1	60·3	58·3	87·7	137·7	...	69·9	55·7
	Mean of month	58·5	56·6	88	65·3	61·7	80·6	64·0	61·8	86·7	60·4	58·6	89	135·5	...	70·0	56·7
OCTOBER	Mean of 1st to 15th	55·3	49·1	56·1	65·6	55·4	43·3	63·1	54·6	56·9	57·8	50·7	59·2	134·1	...	71·3	53·6
	Mean of 16th to 31st	51	42·5	38	56·0	48·1	34	58·7	48·8	40·0	55·1	47·3	50·1	132·2	...	71·4	48·8
	Mean of month	53·1	45·7	47·0	60·8	51·8	38·4	60·8	51·6	48·3	56·3	48·9	54·5	133·1	...	71·3	51·1

Means of Thermometrical Observations at Raneekhet Meteorological Observatory from January to October 1871.

Month.		4 A. M.			10 A. M.			4 P. M.			10 P. M.			Maximum in Sun.	Minimum on Grass.	Maximum in Shade.	Minimum in Shade.
		*Dry Bulb.	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.				
JANUARY	Mean from 1st to 15th	5†	...	...	52·8	40·8	35·4	54·3	41·9	35·9	...†	...	...	124	41·7	61·6	40·3
	Mean from 16th to 31st	...	...	...	56·2	44·7	47·	57·6	46·	44·9	...	...	...	116·7	35·4	63·3	44·9
	Mean for whole month	...	...	...	54·5	42·7	41·2	56·	41·	40·4	...	...	...	120·	38·5	62·5	42·6
FEBRUARY	Mean from 1st to 14th	...	...	...	58·2	46·9	43·7	60·4	47·1	44·3	...	...	...	138·4	37·1	65·6	49·
	Mean from 15th to 28th	...	...	...	50·1	45·7	73·1	54·4	47·6	62·1	...	...	...	132·9	32·1	58·6	41·1
	Mean for whole month	...	...	...	54·1	46·3	55·4	57·4	47·3	53·2	...	...	...	135·6	34·6	61·6	45

* Dry Bulb Thermometer is the Standard Thermometer of the Station, and gives the actual temperature of the air in shade at the hour of observation.
† Observations not taken at these hours until March 21st.

Means of Thermometrical Observations at Raneekhet Meteorological Observatory from January to October 1871 —contd.

Month.		4 A. M.			10 A. M.			4 P. M.			10 P. M.			Maximum in Sun.	Minimum on Grass.	Maximum in Shade.	Minimum in Shade.
		* Dry Bulb.	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.	Dry Bulb.	Wet Bulb.	Humidity.				
March ...	Mean from 1st to 15th	...	...	...	57·3	47·4	53·5	57·8	47·4	51·7	...	...	...	134·1	32·7	62·6	44·
	Mean from 16th to 31st	56·7	44·3	39·4	66·1	47·7	25·3	69·4	46·8	24·1	61·5	46·7	35·2	143·1	...†	72·3	52·8
	Mean for month	...	...	...	61·8	47·5	38·9	63·7	48·5	37·9	...	...	...	138·6	...	67·[illegible]	48·4
April ...	Mean from 1st to 15th	59·2	46·2	39·9	68·6	53·6	31·8	69·1	54·	32·	62·3	46·	42·2	146	...	76·2	55·7
	Mean from 16th to 30th	56·9	48·6	57·5	66·1	54·4	49·6	66·8	52·3	44·7	58·	51·8	57·7	136·8	...	74·2	52·3
	Mean for month.	58·0	47·4	48·7	67·3	54·	40·7	67·9	53·1	38·3	60·1	48·9	50·	141·4	...	75·2	54
May ...	Mean from 1st to 15th	54·8	49·6	73·2	63·3	55·4	65·4	67·1	57·	58·3	58·7	52·4	69·6	129·8	...	72	51·6
	Mean from 16th to 31st	62·	56·	71·2	70·4	62 5	66·2	70·9	69·	67·5	64·3	58·3	72·1	138·3	...	76·3	57·6
	Mean for month	58·4	52·8	72·2	66·9	59·	65·8	69·	63·	63·	61·5	55·3	70·8	134·1	...	74·2	54·6
June ...	Mean from 1st to 15th	64·1	60·3	81·9	71·4	65·	70 6	72·1	63·	72·7	66·6	62·2	79·9	136·3	...	72·	61·5
	Mean from 16th to 30th	62·3	59·8	85 8	68·9	65·1	82·8	71·7	70·2	81·9	67·1	64·8	87·9	128·1	...	79·8	63·2
	Mean for month	63·2	60·	83·8	70·1	65·	76·7	71·9	66·6	77·3	66·8	63·5	83·9	129·7	...	75·9	62·3
July ...	Mean from 1st to 15th	64·	61·7	89·	68·7	65·3	84·9	70·7	67·	84·1	66·1	64·1	90·4	‡	...	75·1	61·9
	Mean from 16th to 31st	63·9	62·1	91·2	68·8	65 3	84·6	69·3	66·2	86·6	65·2	63·6	91·8	...	...	72·9	62·0
	Mean for month	64·	61·9	90·1	68·8	65·3	84·7	70·	66·6	85·3	65·6	63·8	91·1	...	...	74·	62·
August ...	Mean from 1st to 15th	63·5	61·8	91·5	68·5	65·2	85·2	69·7	66·4	86·3	65·4	63·6	91·6	...	...	73·7	62·6
	Mean from 16th to 31st	62·4	60·5	89·1	68·9	65·8	85·3	69·9	66·2	83·8	65·1	63·4	91·9	...	...	73·6	61·6
	Mean for month	62·9	61·1	90·3	68·7	65·5	85·2	69·8	66·3	85·0	65·2	63·5	91·7	...	...	73·7	62·1
September	Mean from 1st to 15th	61·8	59·7	89·6	68·4	64·1	81·2	69·6	64·7	79·	64·2	62·7	89·3	129·8	...	73·6	60·5
	Mean from 16th to 30th	62·8	59·4	86·1	69·1	63·2	74·4	72·5	64·2	68·1	62·8	60·	85·5	139·8	...	75·6	58·7
	Mean for month	62·3	59·5	87·8	68·7	63·6	77·8	71·0	64·4	73·6	63·5	61·3	87·4	134·6	...	74·6	59·6
October ...	Mean from 1st to 15th	60·4	51·5	69·5	70·4	57·6	49·2	71·8	58·9	49·2	62·8	53·0	57·	148·5	...	75·3	59·1
	Mean from 16th to 31st	54·8	45·	...	66·2	50·7	37·	66·6	51·8	37·5	56·1	46·9	...	139·2	...	71·1	[illegible]
	Mean for month	57·6	48·2	69·5	68·3	54·1	43·1	69·2	55·3	43·3	59·4	49·9	...	141·3	...	73·2	57·2

* Dry Bulb Thermometer is the Standard Thermometer of the Station, and gives the actual temperature of the air in shade at the hour of observation.
† Instrument stolen on night of March the 12th.
‡ Maximum in sun's rays out of order.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

COMPARATIVE ABSTRACT OF TRAFFIC ON INDIAN RAILWAYS FOR THE 3rd QUARTER OF 1870-71.

Quarters.		East Indian. Main Line.	East Indian. Jubbulpore Line.	Eastern Bengal.	Calcutta and South-Eastern (State).	Oudh and Rohilkund.	Punjab and Delhi.	Madras.	Great Southern of India.	Carnatic.	Great Indian Peninsula.	Khamgaon Branch.	Dhrangdhra Branch.	Bombay Baroda, and Central India.	Sindh.	Total.
		1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
FIRST QUARTER.																			
Total Earnings	...	718,404	669,700	36,986	40,186	41,999	54,986	2,023	2,774	729	510,207	961	5433	123,760	16,504	1,710,606	1,653,568		
Mean Mileage open	...	1,131	1,279	223	223	113	156	28	28	19	1,063	7	5	312	106	4,449	4,975		
Average receipt per week	...	55,262	50,969	2,946	3,091	3,221	4,230	156	213	56	39,247	59	73	10,957	1,521	131,632	127,230		
Average receipt per week per mile open	...	49·8	38·6	13·8	13·9	28·5	27·1	5·6	7·6	3·0	36·9	8·4	10·4	35·1	14·3	29·6	25·6		
SECOND QUARTER.																			
Total Earnings	...	709,894	578,805	32,143	36,200	39,069	52,126	1,915	2,352	1,246	541,330	775	965	171,727	23,741	1,761,946	1,622,670		
Mean Mileage open	...	1,131	1,279	223	223	113	156	28	28	19	1,184	7	7	312	106	4,594	5,019		
Average receipt per week	...	54,122	44,354	2,473	2,785	3,005	4,010	147	181	96	41,641	60	74	13,210	1,826	135,527	124,813		
Average receipt per week per mile open	...	47·8	34·7	11·1	12·5	26·5	25·7	5·2	6·5	5·1	35·2	8·6	10·6	42·3	17·2	29·5	24·9		
THIRD QUARTER.																			
Total Earnings	...	646,323	406,963	16,314	20,705	44,154	64,029	1,510	1,436	839	215,999	441	171	60,180	17,871	1,089,937	1,063,341		
Mean Mileage open	...	1,131	1,280	223	223	113	156	28	28	19	1,184	7	7	326	106	4,599	5,000		
Average receipt per week	...	43,756	31,459	1,855	1,583	3,396	4,156	116	111	65	16,615	16	13	4,632	1,389	84,546	81,795		
Average receipt per week per mile open	...	36·9	24·6	8·6	7·1	30·1	26·6	4·1	4·0	3·4	14·0	2·3	1·8	14·3	11·9	18·4	16·4		

a. Receipts for 2 weeks and 4 days.
b. Receipts for 6 weeks.
c. These are the corrected figures for the 2nd quarter of 1871.
d. Receipts for 2 weeks and 1 days.
e. Owing to damage done to the permanent-way by the heavy floods during this quarter, the mean mileage open has decreased.

C. H. DICKENS, *Colonel, R. A.,*
Secy. to the Govt. of India.

GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

JURISDICTION OVER EUROPEAN BRITISH SUBJECTS.

No. 5457, dated Fort William, the 4th November 1871.

From—S. C. BAYLEY, Esq., Offg. Secy. to the Govt. of Bengal, in the Judicial Dept.,

To—The Secretary to the Government of India, in the Legislative Dept.

AT a time when the Code of Criminal Procedure is about to be revised, I am directed to submit the Lieutenant-Governor's opinion that it is most necessary and reasonable that European British subjects should be made to a great degree amenable to the ordinary Criminal Courts of the country presided over as they are by British officers of a class at least equal, if not superior, to most of those who exercise jurisdiction over Her Majesty's European subjects in other places and in other parts of the world.

2. The Lieutenant-Governor observes that this measure was, in fact, made a condition in the Imperial legislation of the year 1833, when complete freedom of holding lands in the interior of India was conceded to European British subjects; but that this direction of the Supreme Legislature has never been fulfilled. Europeans have been made amenable to the ordinary Courts under some special and local laws as regards some misdemeanours of a special character, but as regards the whole of the ordinary criminal law of the country, found in the Penal Code, and administered under the Code of Criminal Procedure, European British subjects are still absolutely exempt from the jurisdiction of the ordinary tribunals. The magistrates of the interior have only the jurisdiction given to them under the old statute of George III, enabling them to inflict a fine in the case of minor offences accompanied with violence.

3. The last attempt to remedy the inconveniences arising from this state of things was the enactment of the Indian Legislature enabling the Judges of the High Court to go on circuit to places in the interior for the trial by jury of serious offences committed by Europeans. So far as these provinces are concerned, the enactment is a dead letter. These provinces contain many times the number of Europeans holding land and carrying on industrial occupations in the interior of our districts that are to be found in all the rest of India put together. But we have not large military stations from which juries could be taken, and it need hardly be said that it would be putting all parties in a false position if Government required the members of a limited class in any locality to serve as jurymen for the trial of their own number accused of an offence which may or may not involve class interests. It is even reported from the tea districts that it is most difficult to get any tea planter to sit on a Committee to determine under the Labor Act whether a garden is fit for human habitation. The expense and want of accommodation and other reasons also combine to make it extremely difficult to send a Judge of the High Court to try cases occurring at rare intervals in different parts of the country. Practically the result then is, that still, whenever there is a serious case, all the parties and witnesses must be sent for trial to Calcutta, while in minor cases, not met by the Statute of George III, there is no justice at all.

4. The Lieutenant-Governor does not wish to represent that crime is very common among the European settlers in the interior; on the contrary, he may say that they are generally men of a cla s and character among whom crime is happily rare, and they are well aware that pecuniary success in industrial and mercantile pursuits in the interior depends above all things on good management

of the natives among whom they reside and with whom they deal. But there must be exceptions. And not only as regards cases which actually occur, but as respects the whole position and relations of European settlers, the Lieutenant-Governor is strongly convinced that it would be very much better that they should not have extraordinary, anomalous, and inconvenient privileges, but that for most purposes they should be made amenable to the tribunals of the country as all men are in all the civilized countries of the world. Such a measure would put an end to the temptation to bear themselves as a superior and arrogant caste, which the present state of the law holds out to those who are ill-disposed; and it would put an end to a certain antagonism between the authorities of the country and foreigners claiming the privilege of extra territoriality, which must more or less prevail wherever such a system obtains. The abuses of that system are well known in all the eastern countries, where it is only maintained on the ground that the eastern Governments cannot be acknowledged as members of the European polity. It does seem to the Lieutenant-Governor most strange that the same system should still be applied to British India, a country administered for so long by British officers, and by Magistrates supplied under a system believed to secure the very pick of the educated talent of the United Kingdom. His Honor must again express the belief that it is utterly inconceivable that such men should be supposed to be unfit to be trusted with a jurisdiction over European British subjects which is freely exercised in a summary manner, and generally without appeal, by the Magistrates who sit in the Indian Presidency Towns, in all British Colonies, and in all parts of the United Kingdom, and even by British Consuls in many parts of the world.

5. In illustration of these remarks, I am directed to point to the case of the tea districts, where large numbers of Europeans are settled on the very frontier of British India, and where they come into contact with wild hill tribes. Whenever any case occurs in which a European British subject is accused of a considerable offence against any of these frontier people, he can only be tried by sending him to Calcutta, and summoning to appear in our Courts there the naked savages of that distant and inaccessible region. On the other hand, if such cases are not tried, every settler has it in his power by any indiscreet act to involve the British in a war, the end and expense of which no man can foresee.

6. There is also difficulty in regard to the relations between Europeans and natives within our own districts. Take the province of Assam, where, in addition to such frontier difficulties as have been referred to, we have a large population of immigrant coolies, bound to the soil by most stringent penal laws, and whom we are therefore especially bound to protect. The following extract from a demi-official letter from an officer in high position will explain in some degree the position of the European planters there with reference to the police authority :—

"In regard to the protection the police should be able to afford tea planters, you would not, I fear, regard their action as satisfactory anywhere in Assam. Gardens are usually distinct from police posts; the factory establishments constitute little communities of their own, lying quite outside of the general population, and as isolated often, as cut off from external communication, as ships at sea; but it is far easier for a sailor, when he gets to port, to go ashore and complain of his captain, than for a coolie to go off perhaps one or two days' journey to complain at a thannah. Police constables have little or no opportunity of making themselves acquainted with what is going on in tea gardens. They are as jealous in a tea garden as to persons being about who may be spies as they are in Paris. It is thought even a proper precaution, when a process has to be served in a tea garden, not to entrust it to a single constable, but to give it to a sharp man who can read and write, accom-

panied by two other men. In Menzies Smith's case the coolie Captain would probably have never made his wrongs known but for Mr. Langlois."

7. The enquiries connected with the case of the coolie "Captain" here alluded to show the state of things which is possible. The scene of these affairs is not very remote, but in two tea gardens within a moderate distance of a station occupied by a civil officer.

8. In the case of the coolie "Captain," it was clearly proved that the coolie (who was really a half-witted man), being found on the estate managed by Mr. Smith, and suspected of the perfectly legitimate design of trying to engage the time-expired coolies for another estate, was blindfolded, tied up, and very cruelly flogged, almost in the presence of an European witness; a visitor who abandoned his dinner and went off, in order that he might not witness what was going on. The matter never reached, nor would have reached, the police or the Magistrate if Mr. Langlois, the employer of the flogged coolie, had not taken up the case, and, on Mr. Smith's refusing to apologize, handed him up.

9. In connection with this case, Mr. Langlois mentioned that in visiting Assam he had discovered that his own Manager, a Mr. Reade, was in the habit of flogging the coolies across a tea box and otherwise ill using them, and had been dismissed in consequence. An inquiry was ordered into the general conduct of Messrs. Reade and Smith, and the result is shown in the annexed copy of a report, No. 1086T of the 19th July 1871, from the Commissioner of Assam, with its enclosure. It appears that Mr. Reade, who was a very harsh and unpopular Manager, had established a cordon of chowkeydars round his garden, and that coolies attempting to complain were seized, brought back again, and ill used. As the transactions referred to were past and gone, and the Manager had been dismissed, the Lieutenant-Governor did not push on investigation into every case; but a sufficient number of cases were judicially investigated to make clear the truth or otherwise of the general charge. Some were proved, others (including happily the accusation of causing the death of a coolie) were not; but the result is reported to be that "the charge against Mr. Reade of ill-treating his coolies has been completely substantiated." In the two most serious cases he was convicted and fined.

10. No doubt, a fine may be to a certain extent an efficient punishment in such cases, but it is a punishment of an entirely uncertain character; it may be to one man hard, and be scarcely any deterrent to another. Most of the tea gardens are in the hands of the Agents of Companies or other absentee owners, and if they are fined for over-zeal in the supposed interest of the gardens, there will always be a sort of appeal to the owners by a Manager who tells his own story, and who may persuade his employers that they should relieve him of fine. At any rate, under the conditions existing in Assam, the chance of detection is evidently so small that a fine in the rare cases brought to light is hardly a sufficient deterrent. The Lieutenant-Governor hopes and believes that such cases as those recited are very rare in Assam, but still he quotes them as showing the necessity of giving Magistrates an adequate jurisdiction in all such cases, and in illustration of his argument on the general question of jurisdiction.

11. On that general question the Lieutenant-Governor again expresses a hope that the opportunity of the revision of the Code of Criminal Procedure will be taken to give Magistrates and Judges in the interior of the country such reasonable jurisdiction over European British subjects as may be considered adequate.

No. 1086 T, dated Debrooghur, the 19th July 1871.

From—Colonel H. Hopkinson, Agent to the Govr. Genl. and Commr. of Assam,
To—The Offg. Secretary to the Govt. of Bengal, Judicial Dept.

In continuation of the subject of my report No. 778 T of the 21st June, and with reference to the instructions therein stated to have been given by me that the District Superintendent of Luckhimpore should proceed to make a local investigation into the cases of ill-treatment of coolies brought forward by Mr. Langlois, I have the honor to submit copy of a letter* from the Deputy Commissioner of Luckhimpore, communicating the result of the District Superintendent's inquiries. I refrain from appending a copy also of the District Superintendent's report to Major Clarke, as a sufficiently full abstract has been given in that officer's letter to enable the Government to judge of the character of the information that has been obtained, pending my submission to them of the proceedings in the judicial trials which will now take place, and which will show in detail every fact that may be elicited.

* No. 112, dated 12th July 1871.

2. Captain Phillips, recently appointed to the charge of the sub-division of North Luckhimpore, and whose arrival may be expected there two or three days hence, as he left Debrooghur yesterday, will take up all the cases against Messrs. Reade and G. M. Smith, and, relying on his experience and abilities, I have every hope that his investigation will be searching and complete.

3. Twenty-two cases have been brought forward against Mr. Reade and three against Mr. Smith. In one case against Mr. Reade it is alleged that a coolie named Munzoor Ali died of the beating he received from him; but I am glad to think, from what the District Superintendent reports, that this on trial will prove to be a false or exaggerated charge, and that it will appear that the coolie was beaten when he was sick, but that he did not die the day following the beating as alleged, nor for some time after, and then from natural causes. In four cases coolies are alleged to have been beaten across tea boxes; in four more, wrongful confinement, from four to fifteen days, were added to beating. In the cases against Mr. Smith two men were beaten and confined, and one man beaten. Many of the coolies bear the scars of stripes about their persons.

4. In the garden of which Mr. Reade had charge no provision had been made for hospital accommodation and a proper supply of medicines. Mr. Reade is no longer in charge of a garden, but is now the guest of Mr. G. M. Smith.

5. Mr. Reade's coolies having gone to complain of his conduct to the Manager of another neighbouring garden belonging to the same owners whom Mr. Reade served, they were charged with and punished for unlawful assembly and rioting by the Moonsiff in charge of North Luckhimpore, in the absence of Captain Rutherford, on deputation, to officiate as Deputy Commissioner at Debrooghur. I have asked the Judicial Commissioner to inquire into and report to me on this case.

6. The state of affairs in the Deobhil garden, of which Mr. Reade had charge, gives me reason to suppose that the supervision exercised by Captain Rutherford as Assistant Inspector of Laborers was of the slightest possible value.

No. 112, dated Debroogaur, the 12th July 1871.

From—Major W. C. S. Clarke, Deputy Commissioner, Zillah Luckhimpore,
To—The Personal Assistant to the Commissioner of Assam.

I have the honor to submit the special report of the District Superintendent of Police, Captain W. W. Hume, in the matter of the ill-treatment of coolies by Mr. G. S. Reade, late Manager of the Deobhil Garden, North Luckhimpore, under Mr. Langlois, the Agent for Messrs. Robert and Charriol; also the ill-treatment of certain coolies by Mr. G. M. Smith of

Joyhing, North Luckhimpore—both these planters having been charged with such ill-usage by Mr. Langlois.

2. I gave specific instructions to the District Superintendent, appending your letter to me in the matter for his guidance.

3. The District Superintendent was particularly deputed to inquire into, firstly, the flogging and ill-treating of two coolies by Mr. G. M. Smith; and, secondly, the flogging brutally three coolies across a tea chest by Mr. G. S. Reade; and, thirdly, in the course of these inquiries, should any other similar cases be heard of, to investigate them.

4. With reference to the cases for particular inquiry, and in reply to the questions contained in paragraph 4 of your letter to me on this subject, you will observe from Captain Hume's report that by the statements of the coolies examined, the several acts of flogging apparently did occur; that they were not brought to the notice of the police or the sub-divisional officer, and consequently no instructions were issued in regard to them.

5. With regard to other cases which came to the hearing of the District Superintendent of Police during his inquiry, there is one of a much graver and more serious character: there is a distinct accusation made against Mr. Reade, that he struck a sick and incapable coolie, Munzoor Ali, a blow with a heavy stick, and that he died the next day. Several witnesses support the statement. A stick is produced with which the blow is stated to have been given, and the body of the dead coolie was exhumed and found. The native doctor's statement as to sickness being the cause of death is worthless. This case was also not brought to the notice of the police or the sub-divisional officer. The District Superintendent has reported his opinion that this case is a false one; he appears to think that it would not have escaped Mr. Langlois, and that Mr. Penny, that gentleman's Manager at Cinnatolia factory, would have known of its occurrence were it true; he seems to think that it is a charge got up by the coolies during his inquiries. At any rate, it must be the subject of careful and searching inquiry.

6. Besides this case and that of the three coolies flogged across a tea chest, eighteen other cases appear to have occurred, in which beating and wrongful confinement were inflicted by Mr. Reade; and one other case appears to have occurred at Joyhing, in which a coolie was beaten and confined by Mr. G. M. Smith, besides the cases of which Mr. Langlois accuses him.

7. The Inspector of Laborers, Dr. Meredith, left Upper Assam in June 1869, just two years ago, and since then his duties have been attempted to be carried on by the Deputy Commissioner in addition to his multifarious duties. It is impossible that the work of inspection or protection—for that would be a better term after all—can be effectually performed by an officer tied down to his court and his office, and more particularly in a country like Assam, where the want of roads, the inability to get across country easily or quickly for most months of the year makes a comparatively short distance of eight or ten miles from a thannah quite sufficient for a planter like Mr. Reade, who places a cordon of chowkeydars round his garden to be safe from police surveillance or police intrusion, were he can exercise such harshness that fear prevents complaining even when the sub-divisional officer does visit his garden.

8. I shall desire the officer now in charge of North Luckhimpore to double the amount of the recognizance, and to require a surety in a like sum (Rs. 1,000) from Mr. Reade for his attendance, when required, to answer the charges made against him.

9. Captain Phillips, Assistant Commissioner, who has lately been desired to proceed and take charge of North Luckhimpore, I expect will be here in a day or two, and he will leave as soon after as he can possibly get boats ready for North Luckhimpore, and I propose to hand him over the papers of enquiry, and instruct him to take up and try every single case against both Mr. Reade and Mr. Smith. Captain Phillips is an officer of experience, and the cases may well be entrusted to him.

10. I append a statement showing the cases of beating and confinement of which Messrs. Reade and Smith are accused.

11. As I can find no return of the death of the coolie Munzoor Ali at Deobhil in the returns of laborers of the estate to which that garden belongs for the half-year ending 31st December 1870, I have sent to Mr. Penny, the Manager, to give me the particulars at once.

Statement of cases of alleged beating and wrongful confinement of coolies by Mr. G. S. Reade, Deobhil Factory, North Luckhimpore.

No.	Names of coolies.	Ill-treatment to which subjected.
1.	Khodai	Beaten and confined 4 days.
2.	Bhatoo	Beaten over tea box.
3.	Samahomed	
4.	Sidessur	
5.	Senborn	Beaten at work in garden.
6.	Sukkur Khan	
7.	Dookhai	
8.	Sadoollah	
9.	Ramessur	
10.	Gopal	
11.	Chetoo	
12.	Suttro	
13.	Baghoo	
14.	Sibchurn	
15.	Nobin	
16.	Beni	
17.	Mooreri	
18.	Imameen	Beaten in bungalow.
19.	Manzoor Ali	„ when sick; died.
20.	Hurrechurn	„ and confined 15 days.
21.	Gopal	„ Beaten on a tea box and confined 10 days; again beaten and confined 3 months.
22.	Modhooram Tea Teekla	Beaten and confined 10 days.

W. C. S. CLARKE,
Deputy Commissioner.

Statement of cases of alleged beating and wrongful confinement of coolies by Mr. G. M. Smith, of Joyhing Factory, North Luckhimpore.

No.	Names of Coolies.	Ill-treatment to which subjected.
1.	Narain	Beaten and confined.
2.	Hurruck Nath	Beaten.
3.	Sadhoo	Beaten and confined 7 days.

W. C. S. CLARKE,
Deputy Commissioner.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

REPORT ON THE TRAFFIC OPERATIONS OF THE TELEGRAPH DEPARTMENT FOR THE YEAR 1870-71.

THE two events of the year of greatest public interest were the completion of telegraph communication by sub-marine cable (1) between Bombay and Suez, and (2) between Madras and Penang, Singapore and Batavia.

2. *The British Indian Sub-marine Telegraph Company.*—The cable of this Company, connecting Bombay with Suez, was completed and opened to the public on the 26th March 1870, and this, properly speaking, is an event of the previous year; but as no report was written for that year, it appears advisable to mention it here. One interruption* subsequently occurred, the cable breaking in the Red Sea. Repairs were, however, effected without difficulty, and the completion on the 14th June of a sub-marine line† from Gibraltar *viâ* Lisbon to Falmouth gives us uninterrupted cable communication between India and Europe. This line has worked exceedingly well; the average time occupied between Great Britain and Calcutta during the month of March last by the daily messages of latest dates published in the *Telegraph Gazette* being between five and six hours only. The office of the Company is in the same building and adjoining the Government Signal Office, so that no delay takes place in transferring messages to and from the cable. The Company works under a license granted by the Government of India in accordance with Act VIII of 1860, and is bound to conform to the rules of the International Convention.

3. Nearly 30,000 messages were received from, or transferred to, the cable by the Government office during the year.

4. *The British Indian Extension Telegraph Company.*—The cables between Madras and Penang and Singapore, belonging to the British Indian Extension Company, and that between the latter place and Java, the property of the China Sub-marine Telegraph Company, were opened to the Indian public on the 4th January of this year. The latter cable was interrupted for 21 days, from 12th March till 2nd April, but is now in working order; and the cable to Singapore has continued, since the date of its submergence, to work excellently well. For the first three months to the end of the official year, the traffic between India and the stations of the cable has not been great,—1,313 in both directions, but little more than 15 daily; but the transit messages, *viz.*, those between countries West of India and the far-East, were more numerous, amounting to 3,095, equal to 36 per diem in both directions. The extensions to China, Cochin-China, Japan, and Australia, all of which are expected to be completed this year, will, doubtless, lead to a considerable increase of business. The British

* Interruption lasted from 24th September till 12th October 1870.

† This cable was interrupted from the 1st December till the 11th February.

Indian Extension Company's office is in the Government office at Madras, and the Company works under a license from the Government of India, by the terms of which it is bound to conform to the rules of the Vienna Convention.

5. *The Indo-European Telegraph Company.*—The Indo-European Company, whose system extends from London to Teheran, whence there are two lines to Kurrachee, has, since the final completion of its lines, worked remarkably well, and competes very evenly with the cable route. During the month of March last, the average time in transit between England and Calcutta of the daily messages of latest date published in the *Telegraph Gazette* was, by this route, between six and seven hours.

6. The Turkish line has also improved very materially, and, as the charges by this route are lower than by the other two, there is still a considerable traffic. There have, it is true, been interruptions, but they have not been of avoidably long duration; and the Director General of Ottoman Telegraphs has assured this Direction that his best endeavours will be employed to continue to improve the speed of transmission of Indian telegrams over his system.

7. We find ourselves, therefore, at the close of the year 1870-71 with one fairly good and two admirable routes between India and every telegraph station in the Western World, and with efficient telegraph communication with Penang, Singapore, and Java, and apart from the advantages that these means of rapid communication afford to the Government and public of India, the Indian telegraph system has assumed a far wider importance as being the means of telegraph communication between the far-East and the Western World.

8. The Government of India has not been unmindful of the duty imposed on it by the advantages of its geographical position. It has recently caused to be constructed an entirely new line between Madras and Bombay in the interest of the through traffic, at a very heavy cost. In other directions, by re-constructions and additions, the lines have been put into perfect condition; special facilities have been conceded to foreign messages, and between Madras, Bombay, Kurrachee, and the rest of India, they are now transmitted in an incredibly short time.

9. The establishment of so many private companies in connection with the Government system has very materially increased the labors of this office. The variations of tariffs are many and frequent, requiring careful scrutiny before acceptance and publication, and the settlement of accounts with the companies has become a very important and heavy item in the work of the Check Office.

10. We may, however, fairly expect that if communication by the Eastern cables continues uninterrupted, the traffic will ere long undergo considerable expansion, and the Government may then hope to recoup itself for the heavy expenditure it has incurred, while the trade and commerce of India must benefit by being brought, so to speak, within speaking-distance of the principal marts of the Western and Eastern World.

TARIFFS.

MODIFICATIONS DURING 1870-71.

Inland.

11. On the 1st of March 1870, the uniform one rupee tariff was supplemented by a further concession, allowing three words to count as one in the addresses of messages. The object of this concession was to encourage the use by the public of fuller addresses, and so to prevent the possibility of misdelivery or non-delivery of telegrams. The desired result has not been attained, and it is reported by the present Superintendent of the Check Office that the large majority of undelivered telegrams have miscarried solely in consequence of insufficient directions. There are other objections to the continuance of the system, which is too complicated to be easily understood by the mass, and proposals for a revision will be shortly submitted to Government.

INTERNATIONAL.

12. *British Indian Sub-marine Company.*—From the opening of this line until the 1st July 1870, the charges were the same as by the Kurrachee route. On that date, owing to the completion of the cable—Gibraltar to Falmouth—the Company issued a revised tariff, which was at once circulated to all offices in India.

13. On the 15th January 1871, without reference to this Department, the Company raised its rates on messages from England to India Rs. 11-8 per 20 words; and, on the 15th February, this was increased to Rs. 16-8, and extended to messages from all countries and to messages *from* India. The Indian Government share of this increase was fixed as a temporary arrangement at one rupee. These rates are still in force.

14. On the 1st April 1871 the transit rate for messages passing through India was reduced to Rs. 3-12 per 20 words, and from the same date, the British Indian Sub-marine Company reduced its rates for messages exchanged with the far-East as follows:—

Penang and Singapore messages	...	...	Rs. 10 8
Java messages	...	...	... „ 15 8

making the charge on transit messages between Madras and Europe in the case of Penang and Singapore Rs 11-8, and in the case of Java Rs 16-8, less than the charge for an Indian message.

15. *British Indian Extension Company.*—No change took place in the charges of this Company during the year, though many have been subsequently introduced. The tariff on messages exchanged with India is higher by Re. 1-8 per 20 words than on messages exchanged with places west of India.

16. The Indian terminal charge on messages exchanged with this Company was, up to the close of the year, Rs. 3-12 per 20 words.

17. *Indo-European Company.*—This Company increased its rates simultaneously with, and the same extent as, the British Indian Sub-marine Company, as explained in paragraph 13, without the concurrence of this Government. The subsequent reduction from 1st April in favor of transit messages was also adopted by this Company, and the rates by both routes are, with few exceptions, identical. The Indian terminal and transit charges levied on

messages by this route are the same as on messages exchanged with the British Indian Sub-marine Company.*

18. *Turkish Route.*—The charges by this route and by the Russian Government route have undergone no modification. They remain the same as fixed at the Conference of Vienna, and are much lower than by the alternative lines.

19. In March all the different tariffs were consolidated and compiled on one large sheet, showing the cost by each of the competing routes to all western countries and to all stations of the eastern cables then open. This sheet was legibly printed and copies widely distributed. It remained in force at the close of the year.

NUMBER OF MESSAGES.

20. The number of messages despatched during the year was 629,233, of which 51,872 were "free" messages, leaving 577,361 paid, private, and service telegrams, *i.e.*—

Paid messages.

Private	...	...	... 539,755
Service	...	...	... 37,606

21. The statement below shows the number in detail under each head for the past four years, from which it will be seen that, as compared with the year 1869-70, private messages have increased 21·23 per cent., and Government service messages have decreased 4·56 per cent.; while, as compared with 1867-68, private messages have increased 100·18 per cent., and service messages have decreased in number 9 per cent.:—

Number of messages of all descriptions showing percentage of increase and decrease as compared with previous year.

Year.	Service. No.	Service. Percentage of increase or decrease. Increase.	Service. Percentage of increase or decrease. Decrease.	Private. No.	Private. Percentage of increase or decrease. Increase.	Private. Percentage of increase or decrease. Decrease.	Public News—Free. No.	Public News—Free. Percentage of increase or decrease. Increase.	Public News—Free. Percentage of increase or decrease. Decrease.	Telegraph, Official, and other—Free. No.	Telegraph, Official, and other—Free. Percentage of increase or decrease. Increase.	Telegraph, Official, and other—Free. Percentage of increase or decrease. Decrease.	Total. No.	Percentage of Increase or Decrease. Increase.	Percentage of Increase or Decrease. Decrease.	Number of Offices open during each year.
1867-68 ...	41,306	...	...	269,638	...	...	No records.	...	...	54,669	...	...	365,633	...	...	171
1868-69 ...	40,615	...	1·67	333,856	23·82	...	6,690	...	...	52,391	...	4·20	433,552	18·57*	...	186
1869-70 ...	39,493	...	2·99	445,215	33·36	...	3,597	...	...	55,223	4·5	...	543,435	48·62	...	199
1870-71 ...	37,606	...	4·5	539,755	21·23	...	3,873	...	...	47,999	...	13·06	629,233	15·79	...	205

* Uniform tariff six months in operation.

22. *Free Telegrams, Departmental.*—Notwithstanding the general increase of business, and especially the numerous messages that have had to be despatched in connection with the Cable Companies, it is satisfactory to see that the number of departmental free telegrams has decreased considerably—upwards of 13 per cent.

* This increase of rate was explained by the Company to be essential to its existence, the traffic at the previous low rates having been found insufficient to remunerate either of the competing lines. The advantage of possessing such reliable means of rapid communication as are now afforded is undoubtedly great, and, in the interests of its shareholders, the Directors of the Company are perfectly justified in fixing such a scale of charges as will at least save them from loss.

23. *Foreign Traffic.*—Some portion of this large increase is due to the growth of the international traffic. As shown below, the number of foreign messages in 1870-71 was 67,020, and in 1867-68, 28,351, being an increase of 136·4 per cent., but after deducting all foreign messages, there remains an increase in the number of private inland telegrams of nearly 100 per cent.

Year.	Number of Inland private telegrams.	Number of foreign telegrams.
1867-68	241,287	28,351
1868-69	301,297	32,559
1869-70	401,924	43,291
1870-71	472,735	67,020

24. *Effect of Uniform Tariff.*—This increase is, in the first place, due to the introduction in October 1868 of a low unit of charge, uniform for all distances, which enables the public to send an ordinary telegraphic despatch to or from any station in India for *one rupee*. The great improvement that has taken place in the accuracy and speed of transmission has naturally aided this development, as have also the many facilities for despatching messages that have recently been introduced. Lists of all the telegraph stations in India, including railway telegraph stations, lists of the tariff rules with detailed explanations how to count the words in a message, and a carefully prepared map of the lines and offices, have been published and largely distributed. To encourage the use of the telegraph by the native public, it has been notified that, except at the Presidency town, messages will be translated for all persons unable to read or write English, and the privilege has been conceded to the public of sending from any railway station to any station of the Government system and *vice versâ* at the uniform rate.

25. *Telegrams transferred to and from Railway Telegraph System.*—The number and value of the messages so transferred are shown in detail in the Annexure B. The total number transferred from railway stations to Government stations was 10,282, and from Government stations to railway stations 13,315, making a total of 23,597, or barely 5 per cent. of the total number of inland private* messages. When all railway offices and all Government offices at the same station are connected by wire, as is desired by Government, the number of transferred messages will increase considerably, and the Railway Companies will, it is hoped, soon learn to appreciate the advantages to their own revenue and to the general public that must inevitably follow a more complete amalgamation between the two systems.

Annexure B.

26. The number of messages sent, received, and passed in transit by every office in India is shown in Appendix A.

Appendix A.

* Foreign messages are not despatched from railway stations.

REVENUE.

27. The net receipts for the year amounted to Rs. 13,48,637, made up of the following items:—

	Rs.
Inland messages	9,73,978
Foreign messages	3,27,567
Total ...	13,01,545*
Sale of Telegraph Gazettes	11,514
Guarantees...	6,861
Miscellaneous	28,717
Total ...	13,48,637

28. To ascertain the value of work done, the following *pro formâ* items of revenue must be added:—

	Rs.
Value of "free" messages despatched by order of Government as per notification in *Gazette of India*, No. 474 of the 9th July 1869	49,775
Value of European news messages delivered free to Government functionaries	20,044
Value of Press copies of the above, after deducting payments made by Reuter at concessionary rates	94,155
Total ...	1,63,974
Showing the revenue to the credit of the Department to be ...	15,12,611

29. The following abstract shows at one view the number and value and percentages of increase and decrease in 1870-71 as compared with the year 1869-70. The details for each division are given in Appendix J:—

Appendix J.

Nature of Collection.	Increase.			Decrease.			Percentage of			
							Increase.		Decrease.	
	No.	Rs.	A.	No.	Rs.	A.	No.	Amt.	No.	Amt.
Service	.....	.....	...	1,797	14,881	18½	.....	...	4·56	10·77
Private	94,540	1,05,736	13⅓	...	... ...	...	21·23	9·85	...	.....
Net ...	92,743	90,905	0	...	.....	...	19·13	7·50	...	.....

30. Below is shown the number and value of all messages despatched during the past four years: the value of private messages, it will be seen, has increased 23·12 per cent. since 1867-68, while service (Government) messages

	Rs.
*The actual value of all messages was	26,61,769
From this amount have to be deducted the sums due to other administrations ...	30,60,224
Leaving a balance of	13,01,545

the net Indian share on all messages.

have decreased in value 31·3 per cent.; this decrease has been steady year by year and may be accepted as satisfactory.

Total revenue on account of private and service messages, and percentages of increase in amount of collections as compared with 1867-68.

Year.	Service.				Private.				Total paid Messages.				Free News Messages.	
	No.	Value.	Percentage of increase or decrease in value.		No.	Value.	Percentage of increase or decrease in value.		No.	Value.	Percentage of increase or decrease in value.		No.	Value.
			Increase.	Decrease.			Increase.	Decrease.			Increase.	Decrease.		
		Rs. A.				Rs. A.				Rs. A.				Rs. A.
1867-68	41,306	1,78,700 15	.....	.....	269,638	9,57,439 7	.....	.....	310,944	11,36,140 6	.....	.....	Unknown.	
1868-69	40,615	1,61,297 7	.....	9·75	333,856	9,94,795 3	3·90	.....	374,471	11,56,092 10	1·76	.....	6,690	55,990 0
1869-70	39,403	1,37,592 4	.....	23·0	455,215	10,73,047 11	12·	.....	494,618	12,10,639 15	6·5	.....	3,695	37,688 10
1870-71	37,606	1,22,760 7	.....	31·3	539,755	11,78,784 9	23·12	.....	577,361	13,01,545 15	14·56	.....	3,873	49,775 0

31. *Inland Messages.*—The following return gives the number and value of *Inland* private messages only, for the same periods, showing an increase of 95·93 per cent. in number and 11·43 per cent. in value, as compared with 1867-68, and 17·62 in number and 4·11 per cent. in value, as compared with the previous year 1869-70:—

Inland Private Messages.

Year.	No.	Value.		Percentages of Increase.				
				Compared with 1867-68.		Compared with preceding year.		
				No.	Value.	No.	Value.	
		Rs.	A.					
1867-68	241,287	7,63,880	11	...	...	...	...	
1868-69	301,297	7,96,417	10	24·87	4·25	24·87	4·25	One Rupee tariff 6 months in operation.
1869-70	401,924	8,17,595	2	66·58	7·03	33·39	2·66	
1870-71	472,735	8,51,217	8	95·92	11·43	17·62	4·11	Partially free addresses conceded commencement of this year.

32. These figures speak for themselves and can scarcely be regarded as altogether satisfactory, for while the action of the new tariff has doubled the number of private inland messages transmitted, the revenue derived from them has increased only 11·43 per cent. in three years. A very much higher rate of increase might have been expected under the previous tariff owing to the improvements and extensions of the system and to natural normal expansion. The average yearly increase in revenue from 1860-61 to 1866-67 was 9 per cent., and it must therefore be admitted that the new tariff, while in some respects beneficial, has not proved a financial success.

33. A cheap telegraph, like a cheap post office, is undoubtedly a public advantage. The indirect value of the telegraph in aiding the development of the country's resources, its commerce and wealth, is out of all proportion to the cash revenue of the department. Nevertheless it is unquestionably a duty so to adjust the tariff of charges that those who use the telegraph shall pay in proportion to the direct benefits they derive from it, and that the general revenues of the country shall not unduly suffer for the advantage of a comparatively limited section of the community.

34. Proposals are now before Government for modifying the present tariff which, if approved, will, it is expected, materially improve the revenue, while in no degree limiting the facilities at present enjoyed by the general public. It is not proposed to disturb the system of uniformity, or to increase the present unit charge of one rupee, but there would be no hesitation in recommending such alterations if the result were likely to prove financially successful. Financial considerations alone should determine the tariff, and reductions made on other grounds must, so long as the department is not self-supporting, have the effect of taxing the many for the benefit of the few.

35. None of the conditions exist in this country under which a very low tariff can be expected to succeed. The object of the reductions recently made in telegraph tariffs in Europe is the extension of the use of the telegraph until, like the post office, it becomes a general necessity, to reach the masses in fact, and the large increase in the number of messages that follows more than compensates for the decrease in the rates of charge. These reductions, therefore, are a measure of financial policy, and amongst large and thriving populations generally a successful one. But here, in India, the circumstances are entirely different. It is hopeless to think of reaching the masses, and the only result of the introduction of a low tariff is to enable the very limited section of the community that employs the telegraph to do so at less expense to themselves than formerly.

36. ***Foreign Messages.***—The revenue from international traffic has increased 28·23 per cent., as compared with the previous year, and 69·28 per cent., as compared with 1867-68.

The following is an abstract of the extent and value of the transactions for the past four years:—

Statement showing the extent and value of international traffic, 1867-68, 1868-69, 1869-70 *and* 1870-71.

Year.	Number of Messages despatched			Total.	Indian share of value.	Percentages of increase as compared with previous years.		Remarks.
	To India.	From India.	Transit between far-East and stations West of India.			No.	Value	
					Rs. A.			
1867-68 ...	14,521	13,830	.....	28,351	1,98,558 12	...	...	
1868-69 ...	16,417	16,142	.....	32,559	1,98,377 9	14·84	2·49	Tariff was reduced during 1868-69.
1869-70 ...	21,824	21,467	.....	43,291	2,55,452 9	32·96	28·77	
1870-71 ...	28,810	35,115	3,095	67,020	3,27,567 0	54·81	28·23	

37. A return is also annexed (Appendix E.) showing the number and value of messages transferred to and from each route for each month of the year 1870-71.

Appendix E.

38. The large increase that has taken place in the receipts for foreign messages is due to the completion of direct cable communication with Great Britain, to the high state of efficiency into which the lines of the Indo-European Company have been brought, and to the successful laying of cables from Madras to Penang, Singapore and Java.

39. Since the close of the year 1870-71 telegraph communication has been opened to China, Cochin-China and Japan, and the India receipts for the first four months of the current year show an advance of 23 per cent. over the corresponding period of 1870-71.*

40. There must, however, be a much greater advance before this traffic will become remunerative to this Government, as not only has the direct expenditure on its account been considerable, but the establishment of direct communication with China, &c., will deprive us of a very extensive and valuable traffic hitherto carried on *vid* Galle with China, and on which considerable amounts were collected.

41. Appendix A. shows in detail the number and value of messages despatched from each office and division in India, and Appendix H. the number and value of paid messages sent from each Presidency and Province. The latter return is submitted at the request of the Financial Department. For all practical purposes, the telegraph revenue must continue to be considered as a whole, and the assistance towards the general result that is rendered by a particular province or office is by no means indicated by the amount of its receipts.

Appendix A.

Appendix H.

EXPENDITURE IN SIGNAL OFFICES.

42. The following statement shows the expenditure† incurred on account of Signal Offices for the three years ending 1870-71: for the purpose of comparison the Ceylon expenditure is excluded, as this first became an Indian charge in 1869-70:—

Year.	Offices open (excluding Ceylon.)	Number of messages.	Expenditure in Signal Offices.	Decrease in expenditure as compared with 1868-69.
			Rs. A.	Rs. A.
1868-69 ...	186	433,552	13,47,706 6	.....
1869-70 ...	190	543,435	13,13,425 1	34,281 5
1870-71 ...	197	629,233	12,49,022 8	98,683 14

43. It will be seen from these figures that during the two years immediately following the separation of the traffic from the general branch of the

* Communication with Japan and Cochin-China was not at that date completed.

† The expenditure at each office under the heads of establishment, contingencies, and rent, is shown in Appendix A. "Contingencies" includes travelling expenses of signal establishments, cost of restoring communication, expenses connected with bank offices, petty purchases, &c., &c. Establishment includes pay of all persons employed in offices as well as line-riders, line-runners, camel sowars, &c.

direction, there has been effected a saving of Rs. 1,32,965-3, and if to this amount be added the value of increments to the signal establishment at the same rates as paid in 1868-69, which is a charge beyond control, the actual saving in Signal Office expenditure represents a sum of Rs. 2,21,680-3-0.

44. Considering the nearly universal tendency towards increase of expenditure, the inevitable consequence of improvement and progress, this result will, it is hoped, be accepted as satisfactory, as, notwithstanding this saving, there has been a very large increase in the amount of work done, and a vast improvement in the manner of doing it. There have been no reductions made in the rates of pay, and the interests and well-being of the staff have been carefully attended to.

45. If even the Ceylon expenditure be included, there is still a considerable saving in 1870-71, as compared with 1868-69, as shown below:—

Year.	Number of Offices.	Expenditure.	Difference as compared with 1868-69.	
		Rs. A.	Rs. A.	
1868-69 ...	186	13,47,706* 6	.....	*Exclusive of Ceylon.
1869-70 ...	198	13,55,673† 6	7,967 0 *Increase*	† Inclusive of Ceylon.
1870-71 ...	205	12,95,621† 14	52,084 8 *Decrease*	† Inclusive of Ceylon.

"ERRORS IN TRANSMISSION,—COMPLAINTS."

46. Appendix F. shows the number and percentage of errors that occurred in the transmission of messages for each month of the year 1870-71, and the following return gives an abstract of the same information for the past four years. It will be seen that the percentages for 1870-71 are rather higher than those for the year immediately preceding, but this is due to the scrutiny in the Check Office having, under better management, become much more searching, and not to any real falling off in efficiency.

Appendix F.

Year.	Total number of messages despatched.			Total number of errors of all kinds.			Percentage of errors.			Percentages of decrease as compared with 1867-68.
	Indian.	Indo-European.	Total.	Indian.	Indo-European.	Total.	Indian.	Indo-European.	Total.	
1867-68 ...	337,022	28,611	365,633	4,526	1,169	5,695	1·342	4·085	1·557	
1868-69 ...	400,926	32,626	433,552	3,556	926	4,482	·886	2·838	1·034	33·6
1869-70 ...	499,946	43,489	543,435	2,938	684	3,622	·587	1·572	·666	Indian 54·77 Indo-European 61·52
1870-71 ...	562,213	67,020	629,233	4,600	1,462	6,062	·81	2·18	·96	Indian 54·77 Indo-European 61·52

47. So far from this being the case, the following abstract of the number and percentage of complaints by the public shows a very considerable, indeed an unprecedented improvement. In the year 1868-69 there were 341,845 inland paid messages despatched, and 618 complaints received respecting them = ·18 per cent. During 1870-71, 510,341 inland paid messages were despatched,

and 312 complaints received = ·06 per cent. So that the percentage of complaints received in 1868-69 was three times as high as during 1870-71.

48. As the number of complaints is, perhaps, the best indication of how the public requirements are met, this result is matter for satisfaction.

Number and percentages of complaints by the public.

Year.	Total number of private and service *paid* messages.			Total number of complaints.			Percentage of complaints.		
	Indian.	Indo-European.	Total.	Indian.	Indo-European.	Total.	Indian.	Indo-European.	Total.
1867-68 ...	282,583	28,361	310,944	414	174	588	·15	·61	·19
1868-69 ...	341,845	32,626	374,471	618	285	903	·18	·87	·24
1869-70 ...	441,327	43,291	484,618	418	403	821	·09	·93	·17
1870-71 ...	510-341	67,020	577,361	312	409	721	·06	·61	·12

49. The value of refunds made during the year on account of inland messages was Rs. 207-14, and on foreign messages (after deducting amounts recovered from other administrations) Rs. 1,673.

Appendix G.

50. Appendix G. shows the number, percentage, and nature of complaints for each month of the year.

SPEED OF TRANSMISSION.

51. The improvement obtained in the speed of transmission leaves little to be desired. It will be seen from the following return that during 1870-71 the average rate of transmission, as compared with 1869-70, was as 2·5 to 1, notwithstanding an increase of nearly 20 per cent. in the number of messages; and, as compared with 1867-68, the average speed obtained last year was as 4 to 1, although there had been an increase of 86 per cent. in the number of paid messages.

52. In respect of foreign messages the speed is greater, the average maximum time occupied by this class of messages from one end of India to the other being only *one hour*, and in speed and accuracy of transmission this department is now, it may be confidently asserted, second to none in the world.

Approximate average time occupied by Telegrams in transmission between the following principal stations, including all delays from time of receipt of the message from the senders until time of receipt by the terminal station.

Year.	Calcutta and Kurrachee.			Calcutta and Bombay.			Calcutta and Madras.			Bombay and Kurrachee.			Bombay and Madras.			Mean of time occupied in transmission over all 5 routes.	Total number of paid messages transmitted.
	Calcutta. Kurrachee.	Kurrachee. Calcutta.	Mean.	Calcutta. Bombay.	Bombay. Calcutta.	Mean.	Calcutta. Madras.	Madras. Calcutta.	Mean.	Bombay. Kurrachee.	Kurrachee. Bombay.	Mean.	Bombay. Madras.	Madras. Bombay.	Mean.		
1867-68 ...	17 48	18 55	18 21	19 34	19 45	19 39	8 26	9 27	8 46	6 0	6 45	6 22	9 15	10 13	9 44	12·43	310,944
1868-69 ...	8 8	8 46	8 27	20 41	13 37	17 9	20 35	18 57	19 46	6 4	5 23	5 43	12 20	15 50	14 5	12·52	374,471
1869-70 ...	4 43	3 25	4 4	9 35	8 57	8 46	10 43	10 51	10 47	4 15	3 36	3 55	7 50	7 57	7 53	7·42	484,618
1870-71 ...	2 17	3 30	2 53	5 0	5 12	5 6	2 46	2 53	2 49	1 2	1 57	1 29	2 59	2 55	2 57	3·3	577,361

Statement showing the relative time intervals between each year adopting the average of 1870-71 as the unit.

Year.	Calcutta and Kurrachee.			Calcutta and Bombay.			Calcutta and Madras.			Bombay and Kurrachee.			Bombay and Madras.			Mean.	Total number of paid messages transmitted.
	Calcutta. Kurrachee.	Kurrachee. Calcutta.	Mean.	Calcutta. Bombay.	Bombay. Calcutta.	Mean.	Calcutta. Madras.	Madras. Calcutta.	Mean.	Bombay. Kurrachee.	Kurrachee. Bombay.	Mean.	Bombay. Madras.	Madras. Bombay.	Mean.		
1867-68 ...	.....	.....	6·36	.....	.....	3·3	.....	.....	3·3	.....	.....	4·29	.....	.....	3·3	3·3	310,944
1868-69 ...	.....	.....	2·93	.....	.....	4·77	.....	.....	6·6	.....	.....	3·65	.....	.....	4·77	4·77	374,471
1869-70 ...	.....	.....	1·41	.....	.....	2·67	.....	.....	3·78	.....	.....	2·64	.....	.....	2·67	2·67	484,618
1870-71 ...	.....	.....	1·0	.....	.....	1·0	.....	.....	1·0	.....	.....	1·0	.....	.....	1·0	1·0	577,361

ELECTRICAL.

53. These satisfactory results have been obtained by applying to the service of the department the latest scientific discoveries of Europe, and by enlisting in its ranks men of sufficiently high education to understand their application and with originality to modify and improve them to suit the peculiar circumstances of this country.

54. The department was materially strengthened by the appointment in January 1870 of an Electrical Superintendent. This gentleman, Mr. L. Schwendler, is an electrician of a high order, and to his indefatigable energy and ability much of the improvement now manifest is due.

55. For some time past all stores that require to be electrically perfect are submitted to severe tests at the store-yard before they are sent out. A special testing room was fitted up for the purpose, supplied with the newest and most delicate electrical appliances; a specially qualified Assistant Superintendent is in charge of this duty, and a careful record is kept of the results of each investigation. This precaution has proved most valuable. By its adoption not only is the issue of perfect stores only guaranteed, but being manufacturers ourselves we obtain a complete control over the work done, and a more accurate knowledge of the value and merits of the various articles produced. We have thus been enabled steadily to increase the standard of efficiency for nearly every description of instrument in use, and, by frequent experiments intelligently conducted, the manufacture becomes daily more perfect. It would swell this report to too great a length to attempt to explain the processes of electrical examination, or to enumerate the many improvements that have been made in the form and description of the apparatus employed in our offices; unremitting attention is given to this subject, which is already rewarded with most satisfactory results.

56. The great progress made by telegraphy in India is in a great measure due to the introduction of a system of electrical line-testing. Certain large offices* centrically situated are furnished with complete sets of electrical apparatus, by which the so-called "line-testing" is carried out.

57. By these tests regularly executed and accurately recorded, we are informed of the normal electrical condition of every line; any falling off in the value of any particular wire is at once detected, the probable cause ascertained, and steps taken to remedy it before any actual interrupion takes place. With the aid of these regularly recorded tests, the locality of a defect or accident causing interruption can be fixed with considerable accuracy, and its repair becomes practicable in the shortest possible time and at a minimum expense. We are further made acquainted by these tests with the relative value of different wires and the various sections of the same wire, thus putting it within our power, by selecting the best sections for "through work," to secure a more perfect and safe communication on our important main lines.

58. A careful consideration of the results recorded by the testing officers enables just and reliable conclusions to be arrived at in respect of the material used for the construction of the lines, at least so far as wires and insulators are concerned. It always has been and still is an open question in Europe what form and description of insulator is the best. This question it may be said has now been virtually answered so far as this country is concerned.

59. There are at present several lines which do not work so well as others constructed with similar material, and it has been ascertained by testing that this is due to the presence on these lines of defective insulators, the porcelains of which are partially conducting. This discovery has led to the preparation of

* Calcutta, Madras, Bombay, Kurrachee, Allahabad, Agra, Deesa are regular testing stations. To these others will be added.

a carefully considered code of instructions for the guidance of the English store department, an adherence to which will remove this source of danger in the future.

These are some of the advantages of a system of electrical testing, the benefits of which it is impossible to over-estimate.

60. The internal arrangements of signal stations have been much improved. Instructive technical circulars have been issued to enable the telegraph-masters properly to understand and control every detail, and a reliable means afforded them by a suitable simple apparatus* of testing rapidly and with certainty the condition of batteries, instruments, earth-plates and every technical arrangement of their offices.

SIGNALLING ESTABLISHMENT.

61. There was a general examination held early this year of the whole signal establishment in educational and technical subjects. The result has shown that while some few are rather behind hand, the large majority possesses a very creditable degree of knowledge, and that a considerable number possess attainments of a comparatively high order. One hundred and ten prizes were given for efficiency in various subjects, and several signallers obtained promotion to higher grades.

62. The moral effect of this examination, and of the facilities and inducements to study and improve their knowledge that have been held out, has been excellent. Their conduct on the whole has been very satisfactory, and leaves but little to be desired.

63. The examinations were conducted as nearly as possible simultaneously all over India. All examination papers were then forwarded to Calcutta, and there scrutinised and marks in each subject awarded by an officer told off for this special duty. This officer—Mr. J. Burk—deserves special mention and praise for the conscientious, impartial, and painstaking manner in which he executed this long and tedious task; as to the exceeding care and ability displayed by him the success of the examination is due.

64. The casualties that occurred during the year are shown below:—

Grade.	Resigned.	Dismissed.	Deserted.	Services dispensed with.	Pensioned.	Died.	Total.
Telegraph Masters ...	1	2	1	...	...	1	5
Signallers ...	31	25	...	1	1	5	63
.	32	27	1	1	1	6	68

* The testing galvanometers now being manufactured is a modification by Mr. Schwendler of some received some time back from England, and to which it is in every respect vastly superior.

MILITARY SIGNALLERS.

65. During the year a large number of soldiers have been instructed in signalling. Classes were established at the following stations, and there are now 46 men who have qualified and 166 still under instruction :—

Stations at which classes have been opened:—

Peshawur.	Mhow.	Muttra.
Nowshera.	Neemuch.	Lucknow.
Attock.	Morar.	Bangalore.
Rawul Pindee.	Deolalee.	Secundrabad.
Umritsur.	Belgaum.	Bellary.
Umballa.	Nagpore.	Vizagapatam.
Roorkee.	Agra.	Cuttack.
Barreilly.	Allahabad.	Madras.
Jullunder.	Benares.	Rangoon.
Ferozepore.	Cawnpore.	Deesa.
Meerut.	Barrackpore.	Nusseerabad.
Kussowlie.	Fyzabad.	Kurrachee.
Shajehanpore.	Futtyghur.	

CHECK OFFICE.

66. Mr. G. Barclay, who managed this office very successfully for a portion of the year, resigned the service on the 27th March, 1871, since which date it has been in charge of Mr. Superintendent H. E. Thompson, who has shown marked ability and energy in the conduct of its very important duties.

The *objects* of the institution of the Check Office may be considered to be:—

I.—The prevention of loss to Government through fraud or carelessness on the part of telegraph masters in collecting the charges on messages.

II.—The prevention of errors.

III.—The enforcement of the standing orders of the department so far as they relate to the actual traffic.

IV.—The prevention of abuse of the privilege of *virtually* free transmission of telegrams by public officers.

V.—The settlement of accounts with Cable and Railway telegraph administrations.

VI.—The investigation and settlements of complaints.

VII.—The compilation of traffic statistics.

The nature and amount of the work done during the past year are shown in the following extracts from the Superintendent's report:—

I.

67. *Object* 1 is attained by the examination of all original message drafts to see that they are properly stamped, comparing and correcting registers, and by tracing back every received copy of a paid message to its original. In consequence of the increase of traffic this work had fallen into arrears; but by increasing the number of clerks engaged upon it, it has now been brought quite up to date: the examination of July's messages having been commenced on 15th August, 18 men are engaged on this work. This number is absolutely

required to keep the work up to date. Only 8 men, however, are sanctioned for the work, the remaining 10 being nominally pairers, comparers, &c. The amount of under-charges discovered and reported to the compiler for recovery during the past year, was Rs. 4,906-5, or upwards of Rs. 408 per mensem. The mean pay of the 18 clerks engaged in the work of cash checking was Rs. 304, or about 75 per cent. of the under-charges. This branch of the work of the office therefore (the only one the pecuniary value of which can be exactly estimated) distinctly pay its expenses. The work would, of course, be necessary, whether the recoveries paid for the establishment or not, as even if there were no dishonest or careless telegraph masters or signallers, Government would still require to *know* that they were not being cheated. It is probable, however, that the *indirect* pecuniary value of this branch is even greater than the direct. It is satisfactory to know, however, that the amount recovered more than pays for the extra establishment required.

The amount of under-charges recovered from January 1866 to March 1871 was upwards of Rs. 35,000.

The amount of under-charges is gradually decreasing.

One clerk checks, on an average, 150 messages and their corresponding entries in the register in a day. He also fills up certain columns in the register which are left blank by the telegraph masters, and makes out a docket or abstract of the transactions of each office, and a list of "bearing" and "forwarded" and "service taxee" messages for submission to compiler.

The number of paid messages sent during the year 1870-71 was 577,361; consequently this number of "original" message drafts, and the same number of entries in register, had to be checked.

The labour of cash checking is increased by the clerks having to consider whether a message is "code" or not, and by having to scrutinize the stamps to see that they have not been used before, and to add the value when many stamps are used. Stamps, therefore, increase the work of cash checking.

II.

68. *Object* 5 is sought to be attained by comparing the "received" with the sent copy of every* message. If a material error is found to have been committed it is traced to the office in fault, and the signallers or telegraph masters to blame are fined. The fines range from ½ per cent. of the pay of the *fine* as a minimum. The maximum is not fixed, but, for *errors*, may be considerd as 5 per cent. This, however, is only inflicted in every serious case, involving disobedience of orders as well as carelessness, as in not repeating back figures, &c.: 1 per cent. and 2 per cent. are the most usual rates of fine inflicted.

The total number of fines inflicted during the year 1870-71 was 2,633,—amount Rs. 3,001. The estimated percentage of messages in which errors were made was ·96. The receipts on account of fines are credit to the fine fund, from which also all refunds rendered necessary by the faults of signallers and Telegraph Masters are paid.

The number of men employed in sorting, pairing, and comparing messages now is 29. This is much less than is required to do this portion of the work completely and properly. It is therefore a question for consideration whether the work in this branch should be reduced, or the establishment increased.

* Latterly only half the messages have been examined in consequence of the insufficiency of the sanctioned establishment.

III.

69. All deviations from the established practice which come to light in the course of cash checking and examination of messages are taken notice of, and, if serious, punished by imposition of a fine.

IV.

70. By examination of service messages. The number of objectionable service messages has been found so small that the Director General considers this work as scarcely any longer called for.

V.

71. *Cable Accounts.*—This is the work of two men, but lately, in consequence of the arrears caused by the rates not being agreed upon, four men have been employed on them. The number of entries in accounts which had to be verified often by reference to the original message drafts, was consequently nearly 30,000.

British India Sub-marine Company.—Number of messages transferred to Cable during 1870-71 was 19,488,—amount due to Cable Rs. 7,16,877-8. Received from Cable number of messages 10,520,—share due to Government was Rs. 72,010-5. The discrepancies found by Check Office amounted to Rs. 4,718, with a balance in favor of Government of Rs. 3,460.

British Indian Extension Company.—Cable opened in January. Number of messages transferred to Cable was 2,153,—amount due to Cable Rs. 60,079. Received from Cable 2,304,—amount due to Government Rs. 96,520. Discrepancies discovered Rs. 816, with net balance in favor of Government of Rs. 248. Number of entries to be checked nearly 4,500, and *much trouble* and correspondence.

Railway Accounts.—These are always incorrect. There are ten* Railway systems with which we have dealing.

In 1870-71 number of messages transferred *to* Railway lines was 13,315, number transferred from Railways to Government lines was 10,282,—total 23,597. Amount due to Railways was Rs. 11,648-12-4; amount due to Government Rs. 11,597-4-8. The total of discrepancies was upwards of Rs. 1,200.

VI.

72. *Complaint Branch.*†—The total number of complaints investigated during the year 1870-71 was 721, of which 312 related to inland, and 409 to foreign messages. (See statement of complaints, appendix G.) Complaints regarding foreign messages take a long time to investigate; a complaint regarding a telegram *vid* Russia takes about eight months, *vid* Turkey one year and two months, to dispose of. Eighty-eight refunds were made on inland messages, amounting to Rs. 207-14, and 262 on foreign messages, amounting to Rs. 12,673-3-10, of which Rs. 11,000-4-6 was recovered, or is recoverable, from other administrations.

* *Now*, until lately, the Sindh, Punjab and Delhi Railways were separate, making twelve systems to be settled with.

† Under the head of complaints are registered applications for return of overcharges and of sums deposited on account of "service taxee" messages, which are not, strictly speaking, *complaints*.

Complaints proper may be classed under the heads of—

1. Delay.
2. Error.
3. Non-delivery (including *mis*-delivery).
4. Miscellaneous.

VII.

73. *Traffic Statistics.*—The following periodical statements are prepared in the Check Office:—

1.—Monthly* return of number and Indian value of "sent" messages, with an abstract of foreign message traffic.

2.—Statement of direct traffic (monthly).

3.—Statement of international traffic (weekly).

4.—Statement of Indo-European traffic by Rajpootana line.†

5.—Statement of maximum and minimum time intervals between Calcutta, Bombay, Madras, Kurrachee and Galle, for every day in the year.

6.—Detailed Statement of collections and expenditure of each office (book form) monthly.

7.—Summary of ditto yearly.

8.—Statement of errors.

9.—Statement of collections of offices arranged according to presidencies and provinces yearly.†

10, 11, 12 & 13.—*Diagrams of curves* showing—

(*a.*) Collections, service and private.

(*b.*) Number of messages.

(*c.*) Percentage of errors.

(*d.*) Average time in transit of messages between Bombay, Calcutta, Madras and Kurrachee.

14.—Statement of complaints monthly.

In addition, an account is kept (1) of postage stamps defaced, (2) of drawbacks on Reuter's commercial messages, (3) of value of Reuter's political press messages at concessionary, ordinary, inland, and foreign terminal rates, showing the money value of the concessionary rates, (4) statement of accounts and transactions with other telegraph administrations (to Compiler, monthly), (5) statements of fines in detail, monthly (to Compiler), (6) statement of under-charged messages, (7) of bearing and forwarded messages, and (8) of "service taxee" messages.

The number of letters or other communications sent from the Check Office in 1870-71 was 7,412, and received, 3,165, not including complaints received between April and June, which were 233, making a total of 3,398.

SIMLA,
The 1st September 1871.

ALBERT CAPPEL.

* The same yearly.

† Required by Financial Department.

APPENDIX A.

Abstract of Collections and Expenditure of each Office and Division for the year 1870-71.

DIVISIONS.	Number of Messages.				Number of Paid Messages and Indian Share of Collections.					
					Service.		Private.		Total.	
	Sent.	Received.	Transit.	Total.	No.	Value.	No.	Value.	No.	Value.
						Rs. A.		Rs. A.		Rs. A.
American.										
Aeng ...	251	170	9,268	9,689	7	21 0	80	122 8	87	143 8
Akyab ...	4,972	4,537	3,703	13,212	119	384 0	3,925	11,482 5	4,044	11,866 5
Moungdoo ...	149	135	336	620	10	28 0	89	150 0	99	178 0
Myoo, Left ...	57	20	9,386	9,463	.....	.....	28	40 0	28	40 0
Myoo, Right ...	57	18	9,993	9,078	.....	.....	40	47 0	40	47 0
Pabroo ...	124	46	428	598	1	2 0	39	60 0	40	62 0
Tounghoo ...	190	146	2,901	3,237	23	66 0	97	162 0	120	228 0
Total...	5,800	5,072	35,925	46,797	160	501 0	4,298	12,063 13	4,458	12,564 13
Assam.										
Cachar ...	1,176	1,240	4	2,420	285	1,352 14	913	1,599 0	1,198	2,951 14
Cooch Behar ...	418	588	367	1,373	146	407 0	210	427 8	356	834 8
Darjeeling ...	367	656	.....	1,023	85	275 14	272	457 9	357	733 7
Dhoobree ...	469	275	5,368	6,112	115	228 0	310	473 8	425	701 8
Gowhatty ...	1,233	1,339	1,308	3,880	257	801 0	869	1,510 6	1,126	2,311 6
Julpigorie ...	718	715	1,965	3,398	274	697 4	295	601 8	569	1,298 12
Purneah ...	713	850	4,648	6,211	7	23 0	171	292 10½	178	315 10½
Shillong ...	553	557	2,083	3,193	126	385 4	319	549 14	445	935 2
Sylhet ...	674	818	212	1,704	127	467 8	446	752 12	573	1,220 4
Goalparah ...	554	664	354	1,572	109	248 0	358	561 13½	467	809 13½
Total...	6,875	7,702	16,309	30,886	1,531	4,885 12	4,163	7,226 0	5,694	12,112 5
Bangalore.										
Bangalore ...	4,942	5,463	13,898	24,303	314	614 12	3,708	5,519 10	4,022	6,334 6
Bellary ...	2,247	2,842	13,571	18,660	214	557 0	1,748	2,972 8	1,962	3,529 8
Dharwar ...	1,206	1,853	.....	3,059	27	67 0	1,097	1,798 1	1,124	1,865 1
Kurnool ...	706	869	.....	1,575	68	148 8	606	1,023 4	674	1,171 12
Mysore ...	1,197	1,288	783	3,268	25	63 4	1,102	1,673 3	1,127	1,738 7
Ootacamund ...	2,092	2,867	.....	4,959	358	1,215 10	1,712	2,691 5	2,070	3,906 15
Vellore ...	483	685	23	1,191	16	44 8	388	524 10	404	569 2
Hyderabad (Deccan)	3,616	4,797	635	9,078	251	687 8	3,269	5,822 4½	3,520	6,509 12½
Secundrabad ...	1,561	1,387	.....	2,748	268	865 0	1,116	2,125 10	1,384	2,990 10
Total...	17,880	22,051	28,910	68,841	1,511	4,163 2	14,746	24,152 7½	16,287	28,615 9½
Bengal.										
Agra ...	6,097	11,533	77,390	95,020	360	903 2	4,878	6,810 7½	5,238	7,713 9½
Allahabad ...	5,611	9,094	46,826	61,531	1,138	3,358 8	3,905	5,674 8	5,238	9,033 0
Atcheepore ...	430	598	.....	1,028	4	10 0	300	3,253 8	4,743	3,263 8
Barrackpore ...	778	1,237	43	2,058	35	152 8	610	1,222 13½	304	1,375 5½
Benares ...	2,628	3,443	126	6,097	111	353 6	2,261	4,449 0½	515	4,802 6½
Burdwan ...	653	2,471	17	3,141	24	47 0	410	611 3	2,372	658 3
Burhee ...	479	407	.....	886	71	279 8	134	245 5	434	524 13
Calcutta ...	75,637	78,599	20,600	174,836	2,252	8,985 3½	70,344	1,73,463 11½	72,596	1,82,448 14½
Cawnpore ...	5,556	6,191	240	12,287	261	503 0	5,419	8,127 0½	5,680	8,630 0½
Diamond Harbour ...	497	1,418	24	1,939	3	10 0	208	360 5	211	370 5
Futtyghur ...	1,080	1,164	95	2,339	60	136 8	932	1,341 8	992	1,478 0
Fyzabad ...	951	923	.....	1,874	197	295 8	734	1,220 8	931	1,516 0
Hooghly Point ...	1,634	613	1	2,248	...	.....	1,666	10,060 0	1,666	10,060 0
Lucknow ...	3,516	4,489	26	8,022	389	1,036 8	3,062	5,073 12	3,451	6,110 4
Mirzapore ...	1,83	2,967	74	4,871	31	91 8	1,620	2,696 10	1,651	2,788 2
Mud Point ...	65	692	9	766	...	.....	38	50 0	38	50 0
Murtra ...	919	1,349	.....	2,268	66	176 12	849	1,448 9	915	1,625 5
Bankipore ...	1,448	2,462	2,049	5,959	101	311 8	983	1,928 6	1,084	2,239 14
Raneegunge ...	336	951	26	1,313	2	4 0	185	271 12	187	275 12
Sahibgunge ...	833	451	20,599	21,883	34	70 12	439	473 10½	407	544 6½
Saugor Island ...	869	697	21	1,587	...	.....	44	64 0	44	64 0
Total...	112,047	131,740	168,160	411,953	5,139	16,725 3½	98,645	2,28,847 0½	103,784	2,45,572 3½
British Burmah.										
Henzada ...	740	829	1,990	3,559	114	210 0	543	810 0	657	1,020 0
Moulmein ...	3,751	4,353	26	8,130	115	273 0	3,604	7,376 7	3,719	7,649 7
Myanoung ...	198	194	108	500	56	88 0	121	243 2	177	331 2
Padeng ...	140	69	20,369	20,578	1	2 0	58	75 8	59	77 8
Prome ...	2,234	2,372	201	4,807	180	383 0	1,979	3,234 6	2,159	3,597 6
Rangoon ...	18,730	18,117	4,341	41,188	1,358	4,225 2	16,753	45,279 5	18,111	49,504 7
Shoygheen ...	835	616	1,188	2,639	124	293 0	615	930 4	739	1,223 4
Thyetmyo ...	2,571	2,944	6	5,521	405	1,136 4	2,101	3,721 15	2,506	4,858 3
Tounghoo ...	2,260	2,665	.....	4,925	288	941 0	1,967	3,651 0	2,255	4,592 0
Total...	31,459	32,159	28,229	91,847	2,641	7,531 6	27,741	65,321 15	30,382	72,853 5

Share of Collections due to other Telegraph Systems.	Gross amount collected by the Office.	Expenditure.				Profit.	Loss.	Remarks.
		Establishment.	Rent.	Contingent.	Total.			
Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	
.....	143 8	8,053 8⅞	.....	612 12½	8,666 5½	.....	8,522 13½	
13,632 11	25,499 0	15,188 14	.....	4,428 0	19,616 14	.....	7,750 9	
.....	178 0	2,318 1	.....	368 0	2,686 1	.....	2,508 1	
.....	40 0	Included in Akyab Office.				40 0	.....	Open 11 months.
.....	47 0	Ditto.				47 0	.....	Ditto.
.....	62 0	4,261 15	.....	489 8	4,751 7	.....	4,689 7	
1 0	229 0	6,789 1	.....	310 12	7,099 13	.....	6,871 13	
13,633 11	26,198 8	36,611 7⅞	.....	6,209 0½	42,820 8½	87 0	30,342 11½	
332 6	3,284 4	2,400 15	.....	114 11	2,515 10	436 4	.....	
50 8	885 0	1,730 0	240 0	62 4	2,032 4	.....	1,197 12	
317 9	1,051 0	2,122 12	650 0	154 6	2,927 2	.....	2,193 11	
2 8	704 0	6,805 14	.....	291 9	7,097 7	.....	6,395 15	
297 6	2,608 12	4,727 8	720 0	208 2	5,655 10	.....	3,344 4	
79 12	1,378 8	4,804 0	.....	285 9	5,179 9	.....	3,840 13	
32 5½	348 0	3,944 8	.....	193 11	4,138 3	.....	3,822 8½	
153 2	1,088 4	4,929 15	.....	251 5	5,181 4	.....	4,246 2	
30 0	1,250 4	1,612 9½	.....	185 10½	1,798 3½	.....	577 15½	
19 2½	829 0	2,480 1	.....	68 13	2,548 14	.....	1,739 0½	
1,314 11	13,427 0	35,618 2½	1,610 0	1,816 0½	39,074 2½	436 4	27,308 1½	
2,627 9	8,961 15	15,852 0	 0	666 2	16,518 2	.....	10,183 12	
769 12	4,299 4	13,043 8	950 0	552 14	14,546 6	.....	11,016 14	
144 11	2,009 12	2,244 12	.....	294 8	2,539 4	.....	674 3	
270 14	1,412 10	3,857 1	740 0	110 4	4,707 5	.....	3,535 9	
148 9	1,887 0	4,969 10	.....	175 12	4,845 6	.....	3,106 15	
1,445 15	5,352 14	5,112 0	720 0	199 3	6,031 3	.....	2,124 4	
128 8	691 10	3,696 4	204 0	87 0	3,987 4	.....	3,418 2	
1,082 15½	7,592 12	8,112 10	1,200 0	602 4	9,914 14	.....	3,405 1½	Open 7 month.
562 6	3,563 0	1,060 12	.....	106 5	1,167 1	1,823 9	.....	
7,175 3½	35,790 13	57,648 9	3,814 0	2,794 4	64,256 11	1,823 9	37,404 12½	
782 13½	8,496 6½	30,933 7	.....	2,212 15	33,146 6	.....	25,432 12½	
2,288 12	11,321 12	23,646 10	.....	1,288 5	24,934 15	.....	15,901 15	
.....	3,263 8	2,763 8	480 0	6 0	3,249 8	14 0	.....	
3,630 10½	5,006 0	4,027 8	935 0	191 4	5,153 12	.....	3,778 6½	
706 3½	5,508 10	3,497 11	600 0	228 15	4,326 10	475 12½	.....	
47 2	705 5	3,865 15	.....	113 8	3,979 7	.....	3,321 4	
179 1	703 14	4,385 7	.....	117 13	4,503 4	.....	3,978 7	
4,31,332 2½	6,03,781 0½	66,683 7	4,650 0	6,569 11	77,903 2	1,04,545 12½	.....	
1,129 7½	9,579 14	6,972 4	.....	405 13	7,378 1	1,252 5½	.....	
.....	370 5	4,477 1	.....	41 6	4,518 7	.....	4,148 2	
53 0	1,530 0	2,877 0	.....	97 2	2,974 2	.....	1,496 2	
271 12	1,787 12	1,740 0	.....	156 13	1,896 13	.....	380 13	
1 8	10,081 8	2,715 0	.....	5 14	2,720 14	7,339 2	.....	
1,834 0	7,944 4	4,091 2	900 0	266 7	5,257 9	852 11	.....	
1,191 4	3,979 6	4 404 15	.....	274 5	4,769 4	.....	1,991 2	
.....	50 0	2,901 15	.....	8 14	2,910 13	.....	2,860 13	
681 15	2,307 4	2,412 0	240 0	109 15	2,761 15	.....	1,136 10	
476 0	2,715 14	6,066 8	600 0	504 7	7,170 15	.....	4,931 1	
5 0	280 13	4,382 11	.....	157 10	4,540 5	.....	4,264 9	
57 10½	602 1½	8,288 0	.....	524 4	8,812 4	.....	8,267 13½	
.....	64 0	5,261 8	.....	23 2	5,284 10	.....	5,220 10	
4,34,667 5½	6,80,239 8½	1,96,483 9	8,405 0	13,304 7	2,18,193 0	1,14,479 11½	87,100 8½	
1 0	1,021 0	6,434 3	.....	256 14	6,691 1	.....	5,671 1	
2,793 11	10,443 2	4,996 8	.....	187 8	5,184 0	2,405 7	.....	
137 8	468 10	385 0	.....	.....	385 0	.....	53 14	Open 9 months.
.....	77 8	9,528 6	.....	230 3	9,758 9	.....	9,681 1	
91 14	3,689 4	3,642 0	.....	119 5	3,761 5	.....	163 15	
47,182 3	96,686 10	15,522 15	.....	1,224 12	16,747 11	32,756 12	.....	
49 12	1,273 0	5,635 3	.....	184 4	5,799 7	.....	4,576 3	
268 9	5,126 12	2,476 13	.....	107 1	2,583 14	2,374 5	.....	
208 12	4,800 12	4,347 1	.....	95 13	4,442 14	149 2	.....	
50,733 5	1,23,586 10	52,988 1	.....	2,385 12	55,353 13	37,645 10	20,146 2	

DIVISIONS.	Number of Messages.				Number of Paid Messages and Indian Share of Collections					
					Service.		Private.		Total.	
	Sent.	Received.	Transit.	Total.	No.	Value.	No.	Value.	No.	Value.
						Rs. A.		Rs. A.		Rs. A.
Bombay.										
Ahmedabad ...	4,000	6,808	2,247	12,855	230	641 0	3,578	5,162 10	3,808	5,803 10
Ahmednuggur ...	635	1,150	.....	1,785	47	131 8	576	938 12	623	1,070 4
Baroda ...	791	946	7	1,744	63	201 4	699	1,333 6	762	1,534 10
Belgaum ...	1,390	1,686	42,424	45,500	171	492 4	965	1,485 10	1,136	1,977 14
Bombay ...	109,179	83,089	43,824	236,092	2,464	8,026 2	103,413	2,32,201 9½	105,877	2,40,227 11½
Broach ...	1,631	1,786	5	3,422	22	62 0	1,561	2,614 12	1,583	2,676 12
Deolalee ...	1,505	927	407	2,839	823	2,378 0	455	893 6	1,278	3,271 6
Gunesh Khind ...	219	517	1	737	109	670 6	103	236 14	212	907 4
Kolapore ...	302	509	.....	811	21	74 0	223	508 4	244	582 4
Mahableshwar ...	1,377	1,507	.....	2,884	523	2,116 4	834	1,322 0	1,357	3,438 4
Malabar Point ...	13	18	.....	31	7	21 10	3	5 0	10	26 10
Matheran ...	428	387	75	890	26	58 0	396	661 0	422	719 0
Parell ...	133	254	.....	387	33	213 0	90	243 8	123	456 8
Poona ...	5,585	6,622	902	13,109	1,611	6,119 1	3,712	5,166 7	5,323	12,285 8
Sattara ...	413	495	203	1,110	33	92 0	311	539 11	344	631 11
Surat ...	2,197	3,457	3,101	7,755	57	156 4	1,930	2,783 10	1,987	2,939 14
Nassiok ...	533	535	1,060	2,128	30	82 0	407	643 14	437	725 14
Rajkote ...	1,177	3,269	.....	4,446	127	444 12	1,024	3,093 11½	1,151	3,538 7½
Byculla ...	979	1,285	.....	2,264	17	44 0	908	1,643 9½	925	1,687 9½
Veerungaum ...	174	285	16	475	4	11 0	162	246 0	166	257 0
Wudwan ...	438	1,108	27	1,573	3	12 13	419	1,044 4	422	1,057 1
Total ...	133,099	116,440	93,298	342,837	6,421	22,047 4	121,769	2,63,767 14½	128,190	2,85,815 2½
Ceylon.										
Jaffna ...	1,646	1,257	.....	2,903	15	540 0	951	2,207 8	966	2,361 8
Colombo ...	13,746	20,264	8,196	42,206	102	510 14	13,208	37,456 15	13,310	37,967 13
Dambool ...	318	38	133	489	2	2 0	44	58 4	46	60 4
Galle ...	14,333	11,567	.....	25,900	84	415 5	12,454	53,660 12	12,538	54,076 1
Kandy ...	4,263	3,759	7,685	15,707	99	215 5	3,410	4,738 11	3,509	4,954 0
Manaar ...	997	238	2,146	3,371	13	29 0	295	496 8	308	525 8
Newera Ellia ...	1,485	1,081	.....	2,566	25	44 8	807	1,047 6	832	1,091 14
Trincomallee ...	1,370	941	.....	2,311	89	271 8	578	1,009 0	667	1,280 8
Total ...	38,159	39,135	18,160	95,453	429	1,442 8	31,747	1,00,675 0	32,176	1,02,117 8
Dacca.										
Chittagong ...	3,539	2,789	11,850	18,128	83	266 0	2,612	7,083 15	2,695	7,349 15
Comillah ...	465	482	1,731	2,678	27	71 0	378	806 14	405	877 14
Dacca ...	3,006	2,844	5,051	10,903	150	430 0	2,060	3,668 8	2,210	4,098 8
Goalundo ...	523	150	26,504	27,177	3	8 0	151	223 12	154	231 12
Ramoo ...	281	197	2,776	3,254	10	24 0	196	366 0	207	390 0
Cossimpur ...	16	8	1	25	...	.....	13	16 4	13	16 4
Total ...	7,832	6,420	47,913	62,165	273	799 0	5,411	12,165 0	5,684	12,964 8
Ganjam.										
Balasore ...	832	1,030	1	1,863	14	28 0	636	1,100 0	650	1,128 0
Berhampore ...	3,318	3,670	.....	6,988	79	201 1	3,114	5,459 14	3,193	5,661 0
Bimlipatam ...	8,705	3,194	3,242	10,141	1	7 0	3,531	6,347 3	3,532	6,354 3
Calingapatam ...	431	760	.....	1,191	3	13 0	413	705 4	416	718 4
Chicacole ...	558	677	1,195	2,430	18	43 4	433	704 4	451	747 8
Cocconada ...	13,593	12,884	26,246	52,703	123	262 0	13,358	26,174 7	13,481	26,436 7
Cuttack ...	2,878	1,813	10,965	15,656	129	433 0	1,753	3,246 0	1,882	3,679 0
Dowlaishwaram ...	1,035	1,756	20	2,811	103	223 8	785	1,511 4	888	1,734 12
Midnapore ...	640	1,119	280	2,039	49	106 8	390	658 8	439	765 0
Vizagapatam ...	2,874	3,678	81	6,628	166	530 12	1,811	2,918 11	1,977	3,449 7
Vizianagram ...	848	959	.....	1,807	17	62 0	818	1,931 10	835	1,993 10
Total ...	30,712	31,515	42,030	104,257	702	1,910 8	27,032	50,757 1	27,734	52,667 9

Share of Collections due to other Telegraph System.	Gross amount collected by the Office.	Expenditure.				Profit.	Loss.	Remarks.
		Establishment.	Rent.	Contingent.	Total.			
Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	
249 10	6,053 4	12,099 10	1,480 6	497 11	14,048 11	.....	8,245 1	
353 4	1,423 8	2,182 0	320 0	106 15	2,608 15	.....	1,538 11	
155 6	1,690 0	3,401 0	600 0	43 14	4,044 14	.....	2,510 4	
129 10	2,107 8	16,420 10	600 0	551 9	17,572 3	.....	15,594 5	
4,11,577 10½	6,51,805 5½	65,584 10	15,600 0	7,476 15	88,641 9	1,51,586 2½	.....	
39 8	2,716 4	4,338 11	600 0	120 13	5,059 8	.....	2,382 12	
116 8	3,387 14	2,960 12	.....	145 3	3,105 15	165 7	.....	
1,446 2	2,353 6	1,304 8	.....	147 11	1,452 3	.....	544 15	Open 5 months.
168 0	760 4	3,391 0	.....	153 8	3,544 8	.....	2,962 4	
1,489 8	4,927 12	2,157 7	.....	202 10	2,360 1	1,078 3	.....	
19 8	48 2	478 6	.....	64 13	543 3	.....	516 9	,, 9 ,,
9 8	728 8	1,180 9	.....	159 0	1,339 9	.....	620 9	,, 2 ,,
1,219 6	1,675 14	886 4	.....	32 12	919 0	.....	462 8	,, 9 ,,
6,114 10½	18,400 2½	11,633 11	1,200 0	813 1	13,646 13	.....	1,961 4	,, 4 ,,
111 1	742 12	3,538 0	480 0	149 1	4,167 1	.....	3,536 6	
164 6	3,104 4	10,414 10	504 0	193 11	11,112 5	.....	8,172 7	
71 10	797 8	4,572 1	200 0	273 3	5,045 3	.....	4,319 5	
282 11½	3,821 3	2,692 2	306 12	287 11	3,186 9	351 14½	.....	
1,130 6½	2,818 0	992 6	.....	48 12	1,041 2	646 7½	.....	,, 6 ,,
.....	257 0	223 0	.....	49 10	272 10	.....	15 10	,, 3 ,,
28 7	1,085 8	1,257 12	42 14	326 0 1½	1,626 14 7½	.....	589 9 7½	,, 6 ,,
4,24,876 13	7,10,691 15½	1,51,580 1	21,914 0	11,844 6 7½	1,85,338 7 7½	1,53,828 2½	53,351 7 7½	
26 0	2,287 8	1,771 3½	360 0	52 3½	2,183 5½	78 1½	.....	
38,037 11	76,505 8	10,710 10½	909 14	925 15½	12,636 8½	15,231 4½	.....	
1 0	61 4	930 2	.....	70 6½	1,000 8½	.....	940 4½	,, 9 ,,
136,690 11	190,766 12	8,512 12½	1,440 0	2,050 9½	12,003 5½	42,072 11½	.....	
1,671 8	6,625 8	6,103 8½	1,560 0	569 10½	8,233 2½	.....	3,279 2½	
5 0	530 8	5,325 8	180 0	391 11½	5,897 3½	.....	5,371 11½	
174 14	1,266 12	1,859 7½	.....	98 12½	1,958 4	.....	866 6	
406 8	1,687 0	2,232 14½	330 0	124 0½	2,686 15	.....	1,406 7	
1,77,613 4	2,79,730 12	37,446 2½	4,969 14	4,383 5½	46,599 6½	67,382 1½	11,863 15½	
1,244 5	8,594 4	6,802 5	 0	393 9	7,195 14	154 1	.....	
145 14	1,023 12	2,452 6	330 0	180 0	2,962 6	.....	2,064 8	
280 10	4,379 2	10,837 9½	2,160 0	1,038 12	14,036 5½	.....	9,937 13½	
25 0	256 12	Included in Dacca.			..... 231 12	.....	.....	
.....	390 0	5,467 8	.....	298 8	5,766 0	.....	5,396 0	
16 4	32 8	.....	.....	.....	.....	16 4	.....	Open 7 months.
1,712 1	14,676 6	25,579 12 1½	2,490 0	1,890 13	29,960 9½	402 1	17,398 5½	
24 0	1,152 0	4,379 3	.....	239 15	4,619 2	.....	3,491 2	
141 14	5,803 4	4,878 10	600 0	280 8	5,259 2	402 4	.....	
553 5	6,907 8	7,351 8	245 0	498 10	8,095 2	.....	1,740 15	
30 0	743 4	1,405 3	258 1	73 3	1,736 7	.....	1,018 3	
3 8	731 0	2,964 0	360 0	189 13	3,513 13	.....	2,786 5	,, 10 ,,
8,363 7	34,799 14	15,295 14	620 0	1,001 0	16,916 14	8,519 9	.....	
103 12	3,782 12	11,312 5	787 6	761 14	12,861 9	.....	9,182 9	
52 4	1,787 0	3,523 6	720 0	224 11	4,468 1	.....	2,733 5	
63 0	838 0	5,184 15	.....	234 8	5,419 7	.....	4,654 7	
373 9	8,823 0	7,355 3	540 0	825 14	8,721 1	.....	5,271 10	
35 10	2,029 4	1,989 2 7½	252 0	152 11½	2,393 14 1½	.....	400 4 1½	
9,744 5	62,411 14	85,139 5 7½	4,382 7	4,482 11½	74,004 8 1½	9,921 13	31,258 12 1½	

DIVISIONS.	Number of Messages.				Number of Paid Messages and Indian Share of Collections.					
					Service.		Private.		Total.	
	Sent.	Received.	Transit.	Total.	No.	Value.	No.	Value.	No.	Value.
						Rs. A.		Rs. A.		Rs. A.
Indore.										
Burwai ...	31	52	.....	83	5	14 0	14	25 0	19	39 0
Beora ...	215	392	29	636	3	18 0	165	312 0	168	330 0
Burnuggur ...	504	536	64	1,104	1	3 0	471	620 0	472	623 0
Dhoolia ...	724	735	15	1,474	70	265 0	428	696 14	498	961 14
Gwalior ...	1,146	1,673	1,450	4,269	20	39 0	1,020	2,031 8	1,040	2,070 8
Indore ...	9,012	10,005	15,132	34,149	236	265 8	7,750	10,987 9	7,986	11,633 1
Jowrah ...	1,048	1,497	6	2,551	1	2 0	1,007	1,152 12	1,008	1,154 12
Goonah ...	407	434	268	1,109	29	73 4	248	474 12	277	548 0
Malligaum ...	413	520	216	1,149	48	144 4	241	343 3	289	487 7
Mhow ...	1,316	1,643	.....	2,958	372	1,034 4	865	1,416 15	1,237	2,451 3
Mundisora ...	2,511	2,259	15	4,785	4	8 0	2,458	3,175 4	2,462	3,183 4
Neemuck ...	1,556	2,132	.....	3,688	152	452 0	1,363	2,007 4½	1,515	2,459 4½
Rutlam ...	2,861	3,114	119	6,094	5	22 0	2,804	3,331 4	2,812	3,353 4
Seepree ...	283	376	1,512	2,171	26	51 0	137	229 6	163	280 6
Shajapur ...	333	478	9	820	19	59 0	261	458 4	280	517 4
Morar ...	948	865	1	1,814	179	472 6	674	1,079 4	853	1,551 10
Total ...	23,307	26,711	18,836	68,854	1,173	3,302 10	19,906	28,331 1½	21,079	31,633 11½
Madras.										
Bezwarah ...	683	1,094	12,751	14,528	21	40 0	443	765 12	464	805 12
Cuddalore ...	313	510	.....	823	10	34 0	291	476 0	301	510 0
Guntoor ...	2,370	2,211	2	4,583	6	13 0	2,316	3,171 4	2,322	3,184 4
Madras ...	35,831	33,816	47,026	116,673	2,026	5,504 13	31,422	72,744 1½	33,448	78,249 14½
Masulipatam ...	1,790	2,173	.....	3,963	84	154 8	1,681	2,797 6	1,765	2,951 14
Negapatam ...	2,938	3,697	1,190	7,825	107	223 0	2,785	5,480 1½	2,892	5,703 1½
Nellore ...	478	672	6	1,156	20	36 8	359	606 12	379	643 4
Paumben ...	1,000	584	39,628	41,212	12	36 0	484	833 4	496	869 4
Pondicherry ...	4,487	5,967	403	10,857	4	17 0	4,408	10,460 9	4,412	10,487 9
Total ...	49,890	50,724	101,006	201,620	2,290	6,058 13	44,189	97,325 2	46,479	1,03,383 15
Malabar.										
Allepi ...	2,783	2,913	38	5,734	.....	.....	2,863	4,513 13	2,863	4,513 13
Calicut ...	6,858	7,074	2,130	16,062	185	513 12	6,389	9,340 7½	6,574	9,854 3½
Cannanore ...	2,887	2,846	763	6,496	285	729 4	2,308	3,600 2	2,593	4,329 6
Carwar ...	2,816	2,363	28	5,207	78	156 0	2,479	3,595 10	2,557	3,751 10
Cochin ...	7,316	7,236	8,265	22,817	6	6 0	7,217	11,899 5	7,223	11,905 5
Coompta ...	2,877	2,919	5,492	11,318	4	12 0	2,779	4,033 12	2,783	4,045 12
Honor Bank ...	4	1	348	353	.....	.....	.....	.....	.....	.....
Goa ...	1,051	1,452	53	2,556	.....	.....	936	1,460 4	936	1,460 4
Kangalore ...	3,267	3,328	364	6,959	79	165 4	2,922	4,405 3	3,001	4,570 7
Mercara ...	1,346	2,221	28,675	32,242	30	79 8	761	1,156 1	791	1,235 9
Nagercoil ...	326	300	271	897	.....	.....	302	611 2	302	611 2
Palamcotta ...	1,148	1,229	281	2,658	56	140 0	1,061	2,235 5	1,117	2,375 5
Quilon ...	965	1,125	1	2,091	6	11 0	890	1,604 12	896	1,615 12
Tellicherry ...	3,373	3,513	160	7,046	29	92 0	3,260	5,870 6	3,289	5,962 6
Trivandrum ...	1,282	1,615	173	3,070	10	25 8	1,161	1,970 14	1,171	1,996 6
Tuticorin ...	4,756	3,476	4,108	13,340	13	36 0	4,133	9,158 6	4,145	9,194 6
Vingorla ...	2,315	2,146	17	4,478	63	114 0	1,671	3,157 0	1,734	3,271 0
Total ...	45,370	45,785	51,267	142,324	944	2,080 4	41,131	67,612 6½	41,975	69,692 10½
Nagpur.										
Akola ...	811	1,227	97	2,135	126	374 0	652	848 12	778	1,222 12
Akote ...	817	937	3	1,757	6	11 0	806	1,019 4	812	1,030 4
Bhosawul ...	396	1,266	4,296	5,958	4	10 0	274	215 1	278	225 1
Jubulpur ...	2,386	3,246	769	6,401	338	910 0	1,734	2,567 11	2,072	3,477 11
Damagodium ...	423	533	.....	995	51	145 0	137	329 12	188	474 12
Enchampilly ...	510	775	161	1,446	22	39 8	102	172 0	124	211 8
Hingunghaut ...	1,998	1,961	401	4,363	3	11 0	1,926	2,188 8	1,929	2,199 8
Kamptee ...	1,438	1,566	.....	3,004	251	713 0	1,173	1,712 5	1,424	2,425 5
Julgaum ...	433	809	12,178	13,420	1	6 0	245	245 8	246	251 8
Khangaum ...	4,722	5 334	143	10,199	13	38 8	4,672	5,668 0	4,690	5,706 8
Nagpur ...	3,415	3,583	16,573	23,571	498	1,396 12	1,792	2,440 0½	2,288	3,836 12½
Omrawattee ...	6,916	6,956	28	13,899	92	230 0	6,787	8,708 4	6,879	9,178 4
Seonee ...	325	286	89	700	15	40 0	97	154 4	112	194 4
Khundwa ...	722	966	5	1,693	147	304 8	461	630 13	608	935 5
Sironcha ...	636	484	259	1,379	19	66 0	133	370 0	152	436 0
Boorhanpore ...	116	126	.....	242	6	14 0	104	133 8	110	147 8
Total ...	26,062	30,035	35,002	91,099	1,595	4,359 4	21,095	27,493 10½	22,690	31,852 14½

Share of Collections due to other Telegraph System.	Gross amount collected by the Office.	Expenditure.				Profit.	Loss.	Remarks.
		Establishment.	Rent.	Contingent.	Total.			
Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	
5 0	44 0	120 14	.....	21 2	142 0	.....	103 0	Open 2 months.
3 0	333 0	1,720 3	.....	87 1	1,807 7	.....	1,477 0	
1 0	624 0	966 8	.....	41 9	1,008 1	.....	385 1	
79 10	1,031 8	2,109 8	.....	68 10	2,178 2	....	1,226 4	
53 2	2,123 8	3,699 2	.....	227 9	3,926 11	.....	1,856 5	
327 12	11,960 13	15,626 9	.....	1,351 14	16,978 7	.....	5,345 6	
2 0	1,156 12	1,081 5	.....	97 11	1,179 0	.....	24 4	
1 8	549 8	1,931 8	.....	284 0	2,215 8	.....	1,667 8	
45 15	533 6	2,184 15	.....	130 9	2,315 8	.....	1,828 1	
736 2	3,187 5	1,812 0	.....	112 15	1,954 15	496 4	.....	
6 8	3,189 12	3,754 0	.....	276 15	4,030 15	.....	847 11	
35 12	2,495 0½	2,779 8	450 0	267 13	3,497 5	.....	1,038 0½	
15 4	3,368 8	4,630 15	.....	243 15	4,874 14	.....	1,521 10	
82 10	383 0	3,883 6	.....	298 4	4,181 10	.....	3,901 4	
18 4	535 8	1,137 1	... .	101 7	1,238 8	.....	721 4	
483 0	2,034 10	625 8	.....	174 11	800 3	751 7	.....	„ 11
1,896 7	33,530 2½	48,092 14	450 0	3,786 4	52,329 2	1,247 11	21,943 1½	
33 0	838 12	11,210 15	.....	277 3	11,488 2	.....	10,682 6	
135 0	645 0	1,176 0	.....	17 10	1,193 10	.....	683 10	
2 8	3,186 12	2,514 0	.....	106 10	2,620 10	563 10	.....	
1,41,721 8	2,19,970 6½	36,815 1	2,400 0	3,846 6	43,061 7	35,187 7½	.....	
56 0	3,007 14	2,508 1	240 0	79 8	2,827 9	124 5	.....	
1,166 13½	6,869 14½	7,443 3	420 0	397 2	8,260 5	.....	2,557 3½	
49 8	692 12	3,275 1	540 0	90 12	3,905 13	.....	3,262 9	
51 12	921 0	11,504 6	.....	211 3	11,715 9	.....	10,846 5	
11,366 9	21,834 2	5,909 4	342 0	173 12	6,425 0	4,042 9	.....	
1,54,582 10½	2,57,968 9½	82,355 15	3,942 0	5,200 2	91,498 1	39,917 15½	28,032 1½	
350 3	4,864 0	2,448 0	360 0	169 11	2,977 11	1,536 2	.....	
2,696 6½	12,752 8½	8,981 8	720 0	670 3	10,371 11	.....	517 7½	
329 3	4,058 8	4,221 9	680 0	526 2	5,427 11	.....	1,096 5	
170 10	3,922 4	5,901 0	.....	453 6	6,354 6	.....	2,502 12	
1,287 15	13,193 4	2,966 0	480 0	810 7	9,256 7	2,968 14	.....	
9 8	4,058 4	2,903 4	360 0	329 5	10,711 9	.....	6,665 13	
.....	.....	.....	.....	.....	.....	.....	.....	
722 12	2,183 0	6,282 14	120 0	353 5	6,756 3	.....	5,295 15	Open 1 month
666 13	5,237 4	5,876 4	480 0	452 12	6,809 0	.....	2,338 9	
543 5	1,778 14	8,816 6	.....	464 15	9,281 5	.....	8,045 12	
27 10	638 12	2,410 4½	180 0	80 7	2,670 11½	.....	2,059 9½	
320 13	2,696 2	3,313 3	252 0	102 8	3,667 11	.....	1,292 6	
7 8	1,623 4	2,484 13	300 0	120 11½	2,905 9½	... .	1,289 13½	
2,788 6	8,750 12	2,581 14	480 0	373 14	3,436 12	2,526 10	.....	
190 10	2,187 0	5,114 2	480 0	123 13	5,717 15	.....	3,721 9	
1,318 14	10,513 4	8,410 1	.....	604 11	9,014 12	179 10	.....	
36 8	2,307 8	3,924 0	264 0	202 13	4,390 13	.....	2,119 13	
11,668 14½	81,361 8½	89,304 3½	5,186 0	5,838 15½	1,00,329 2½	6,211 4	36,847 12½	
12 8	1,235 4	1,840 0	.....	138 7	1,978 7	.....	755 11	
55 8	1,085 12	976 0	.....	50 3	1,026 3	4 1	.....	Open 6 months.
53 15	279 0	5,397 0	422 0	459 11	6,278 11	.....	6,053 10	„ 7 „
1,106 1	4,583 12	9,012 11	.....	813 10	9,826 5	.....	6,348 10	Transferred to the Public Works Dept. from November, 1870.
32 0	506 12	1,248 0	.....	93 11	1,340 11	.....	865 15	Ditto ditto.
.....	211 8	1,775 4	.....	36 7	1,811 11	.....	1,600 3	
145 8	2,345 0	2,294 0	.....	193 10	2,487 10	.....	288 2	
316 10	2,741 15	694 6	.....	41 9	735 15	1,689 6	.....	
2 0	253 8	3,393 13	150 0	404 2	3,947 15	.....	3,696 7	Open 6 months.
50 8	5,757 0	3,181 0	480 0	322 6	3,983 6	1,723 2	.....	
322 2	4,148 14½	16,342 1	.....	866 12	17,208 13	.....	13,372 0½	
81 0	2,158 4	3,705 3	510 0	301 13	4,517 0	4,561 4	.....	
31 8	285 12	2,388 0	.....	160 14	2,548 14	.....	2,354 10	
58 8	990 13	1,968 4	74 0	448 3	2,490 7	.....	1,555 2	
.....	436 0	1,937 7	.....	198 15	2,136 6	.....	1,700 6	Transferred to the Public Works Dept. from November, 1870.
6 8	154 0	680 0	.....	4 10	684 10	.....	537 2	Open 6 months.
2,271 4	34,124 2½	56,833 1	1,636 0	4,533 15	63,003 0	7,977 13	39,127 14½	

DIVISIONS.	Number of Messages.				Number of Paid Messages, and Indian Share of Collections.					
					Service.		Private.		Total.	
	Sent.	Received.	Transit.	Total.	No.	Value.	No.	Value.	No.	Value.
						Rs. A.		Rs. A.		Rs. A.
Punjab.										
Abbottabad ...	556	772	.....	1,328	226	1,041 8	322	538 4	548	1,579 12
Allyghur ...	693	1,271	.....	1,954	31	58 8	535	771 3½	566	822 11½
Attock ...	162	329	56	547	25	54 0	113	186 12	138	240 12
Bareilly ...	1,358	1,528	1,397	4,283	175	393 0	1,089	1,802 10	1,264	2,195 10
Delhi ...	4,975	5,069	.....	10,044	226	529 8	4,635	6,272 13 7/12	4,861	6,802 5 7/12
Dera Doon ...	769	883	32	1,684	32	87 8	715	1,327 11	747	1,415 3
Hatimurdan ...	263	361	32	656	137	589 0	119	183 8	256	772 8
Hurdwar ...	101	215	3	319	20	48 0	78	138 5	98	186 5
Jhelum ...	495	524	24	1,043	105	361 14	343	621 4	448	983 2
Jullunder ...	901	1,253	93	2,247	75	175 0	781	1,496 8½	856	1,671 8½
Kussowlee ...	746	776	6	1,528	143	305 8	578	1,018 8	721	1,324 0
Lahore ...	6,111	8,284	12,690	27,085	1,354	4,076 4	4,020	6,207 2	5,374	10,283 6
Meerut ...	3,813	4,351	12,788	20,952	320	667 13½	2,826	3,965 13½	3,146	4,633 11
Moradabad ...	1,045	1,304	311	2,660	82	194 8	776	1,322 2	858	1,516 10
Lieut.-Govr.'s Camp	45	.....	.....	45	21	74 0	22	28 0	43	102 0
Murree ...	2,217	2,434	.....	4,651	794	2,383 0	1,298	2,295 3	2,092	4,678 3
Mussooree ...	1,151	1,410	.....	2,561	92	215 8	1,041	1,804 1	1,133	1,819 9
Nowshera ...	379	469	61	909	72	187 0	258	371 4	330	558 4
Nynee Tal ...	1 269	1,518	.....	2,787	358	761 11	880	1,440 2	1,238	2,201 13
Peshawur ...	1,995	2,245	.....	4,240	587	2,277 12	1,350	2,368 5	1,937	4,646 1
Kohat ...	472	428	134	1,034	123	405 0	334	534 0	457	939 0
Rawul Pindee ...	2,291	2,062	1,186	5,539	371	1,041 8	1,284	2,106 10	1,655	3,148 2
Roorkee ...	595	617	473	1,685	182	337 8	368	585 7	550	923 15
Shajehanpore ...	562	541	257	1,360	58	140 0	441	620 2	499	760 2
Simla ...	7,088	9,969	771	17,828	3,007	12,952 9	3,213	5,538 15	6,250	18,491 8
Umballa ...	3,174	4,672	2,211	10,057	417	1,105 10	2,293	3,536 9½	2,710	4,642 3½
Amritsur ...	2,061	2,555	.....	4,616	78	210 0	1,970	3,144 9	2,048	3,354 9
Forezepore Arsenal	162	184	.....	346	13	28 8	92	149 3	105	177 11
Forezepore Cantonment ...	477	.....	.....	477	21	44 8	299	494 9	320	539 1
Right & Left Bank, Ganges ...	2	.....	.....	2	.....	.....	.....	.....	.....	.....
Kuthalia ...	13	.....	.....	13	.....	.....	3	6 0	3	6 0
Wazeerabad ..	9	.....	.....	9	.....	.....	2	3 0	2	3 0
Total ..	45,940	56,024	32,525	1,34,489	9,145	30,746 1½	32,103	50,658 8 11/12	41,252	81,404 10½
Rajpootana.										
Aboo ...	674	789	.....	1,463	193	534 0	414	590 0	607	1,124 0
Ajmere ...	3,444	4,485	425	8,354	199	576 0	3,024	4,943 14	3,223	5,519 14
Beawur ...	803	869	5	1,677	27	53 0	658	1,025 8	685	1,078 8
Bhurtpore ...	417	495	3	915	94	395 10	288	779 8	382	1,175 2
Deesa ...	1,683	2,269	18,155	22,107	135	367 4	644	1,143 1	779	1,510 5
Erinpoorah ...	550	760	3	1,313	43	111 0	422	863 0	464	974 0
Jeypore ..	4,910	5,639	1	9,550	99	376 3	3,797	5,275 12½	3,896	5,651 15½
Omerkote ...	856	464	.. ...	870	38	97 12	217	472 8	250	570 4
Nusseerabad ...	899	1,007	.....	1,906	240	625 4	641	1,070 12	881	1,696 0
Total ...	12,836	16,777	18,592	48,205	1,062	3,136 1	10,105	16,163 15½	11,167	19,300 0½
Scinde.										
Dera Ghazee Khan	1,129	801	2,080	4,010	243	638 8	379	571 0	622	1,209 8
Dera Ismail Khan...	820	1,197	....	2,017	268	891 4	523	858 6	791	1,749 10
Hydrabad (Scinde)	1,769	1,990	342	4,101	320	911 4	1,197	2,062 10	1,517	2,973 14
Jacobabad ...	554	687	8	1,249	124	517 12	349	616 10	473	1,134 6
Kurrachee ...	31,133	31,000	229	62,360	1,158	8,360 6	27,761	1,14,129 9½	28,919	1,22,489 15½
Mooltan ...	2,368	2,550	85	5,003	150	393 8	1,941	2,910 11	2,091	3,304 3
Kusmore ...	40	50	.....	90	.....	.....	15	35 0	15	35 0
Rajunpore ...	409	502	66	977	98	246 3	186	300 12	284	547 4
Shikarpore ...	1,150	1,158	.....	2,308	91	252 0	1,010	1,463 0	1,101	1,715 0
Sukkur ...	2,563	2,326	1,540	6,429	205	455 8	2,287	3,348 0	2,492	3,803 8
Taroosh ...	31	68	4	103	3	5 0	21	27 0	24	32 0
Total ...	41,966	42,331	4,354	88,651	2,660	12,771 10	35,669	1,26,222 10½	38129	1,38,994 4½

Share of Collections due to other Telegraph system.	Gross amount collected by the Office.	Expenditure.				Profit.	Loss.	Remarks.
		Establishment.	Rent.	Contingent.	Total.			
Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	
118 12	1,698 8	1,086 0	.....	81 15	1,167 15	411 13	.....	
62 1½	891 12½	1,905 8	.....	227 15	2,133 7	.....	1,303 11½	
25 0	265 12	1,972 14	.....	72 15	2,045 13	.....	1,805 1	
410 6	2,006 0	3,640 9	360 0	294 10	4,295 3	.....	2,090 9	
652 5½	7,454 11½	3,733 0	320 0	387 14	4,440 14	2,361 7 7/12	.....	
1,215 5	2,630 8	1,370 14	.....	300 2	1,671 0	 12	255 13	
0 8	773 0	890 2	.....	80 0	970 2	.....	197 10	
42 7	228 12	1,336 0	.....	112 15	1,448 15	.....	1,262 10	
296 2	1,279 4	Included in		Lahore	.....	983 2	.....	
747 14	2,419 6½	3,789 6	420 0	403 7	4,612 13	... ...	2,941 4½	
377 8	1,701 8	999 9	... .	119 9	1,119 2	204 14	.....	
3,753 7½	14,036 13½	14,833 1	.....	2,676 8	17,509 9	.....	7,226 3	
1,501 11½	6,135 7½	11,073 5	... ...	1,232 5	12,305 10	.....	7,671 15	
193 10	1,719 4	4,679 5	440 0	396 2	5,515 7	.....	3,998 13	
1 0	103 0	.....	.....	.....	.....	102 0	.....	Open 1 month.
1,047 1	5,725 4	2,148 10	.....	224 4	2,372 14	2,305 5	.....	
524 11	2,314 4	1,228 13	.....	156 8	1,385 5	434 4	.....	,, 7 months.
26 0	684 4	1,153 3	.....	151 0	1,304 3	.....	745 15	
951 5	3,153 2	1,409 12	.....	154 9	1,564 5	637 8	.....	,, 6 ,,
751 1	5,397 2	3,266 0	.....	141 0	3,407 0	1,239 1	.....	
35 8	974 8	153 11	.....	22 7	176 2	762 14	.....	,, 11 ,,
813 12	3,961 14	5,226 3	.....	485 2	5,711 5	.....	2,583 3	
261 7	1,164 6	2,179 8	280 0	236 9	2,696 1	.....	1,783 8	
102 2	862 4	2,770 10	.....	286 14	3,057 8	.....	2,207 6	
17,271 12	35,703 4	6,507 13	.....	498 6	7,006 3	11,485 5	.....	
2,028 13½	6,671 1½	11,402 9	840 0	1,554 11	13,797 4	.....	9,155 0½	
273 7	3,628 0	1,086 5	482 7	249 15	2,718 11	635 14	.....	
108 5	286 0	204 6	.....	82 14	.....	.....	109 9	Open 5 months.
138 15	678 0	204 6	Included in	Ferozepore Arsenal	287 4	539 1	.....	,, 5 ,,
.....	.....	.....	.....	.....	.....	.....	.....	,, 1 month.
.....	6 0	.....	.....	.....	.....	6 0	.....	,, 2 months.
.....	3 0	.....	.....	.....	.....	3 0	.....	,, 1 month.
33,732 5½	1,15,136 15½	90,947 0	3,142 7	10,630 8	1,04,719 15	22,111 8 7/12	45,426 13½	
81 0	1,205 0	2,160 0	703 11	197 7	3,061 2	.....	1,857 2	
492 6	6,012 4	7,388 15	.....	446 2	7,835 1	.....	2,815 3	
1 8	1,080 0	2,680 8	.....	373 2	3,053 10	.....	1,975 2	
287 10	1,462 12	2,097 7	.....	172 3	3,169 10	.....	1,994 8	
220 15	1,731 4	18,202 10	.....	1,459 4	19,661 14	.....	18,161 9	
7 0	981 0	2,891 7	.....	226 5	3,117 13	.....	2,143 12	
578 4½	6,230 4	6,334 8	.....	628 8	6,963 0	.....	1,311 0½	
.....	570 4	3,340 12	320 0	351 6	4,012 2	.....	3,441 14	
333 4	2,029 4	2,389 13	50 0	135 6	2,575 3	.....	879 3	
2,001 15½	21,302 0	48, 386 0	1,073 11	3,989 14	53,499	.....	34,149 5½	
20 8	1,230 0	4,722 13	360 0	505 3	5,588 0	.....	4,378 8	
97 0	1,848 10	2,524 10	.....	115 8	2,640 2	.....	990 8	
187 0	3,160 14	12,149 13	.....	563 15	12,713 12	.....	9,739 14	
68 12	1,301 2	3,657 0	.....	161 13	3,818 13	.....	2,584 7	
31,549 13½	1,54,039 13	24,034 9	.....	1,157 5	25,181 14	97,308 1½	.....	
420 3	3,624 6	57,59 8	900 0	521 15	7,181 7	.....	3,977 4	
.....	35 0	.....	.....	.....	.....	35 0	.....	Open 3 months.
71 8	618 12	2,651 8	.....	261 11	2,913 3	.....	2,365 15	
122 0	1,857 0	3,445 15	.....	106 7	3,552 6	.....	1,887 6	
45 0	3,848 8	9,177 12	.....	503 6	9,681 2	.....	5,877 10	
.....	32 0	1,351 6	.....	69 15	1,421 5	.....	1,389 5	,, 4 ,,
32,599 12½	1,71,594 1	66,464 14	1,260 0	3,967 2	74,692 0	97,343 1½	33,040 13	

SUMMARY 1870-71.

DIVISIONS.	Number of Messages.				Number of Paid Messages, and Indian Share of Collections.						Share of Collections due to other Telegraph System.	Gross amount collected by the Office.	Expenditure.				Profit.	Loss.	Remarks.
	Sent.	Received.	Transit.	Total.	Service.		Private.		Total.				Establishment.	Rent.	Contingent.	Total.			
					No.	Value.	No.	Value.	No.	Value.									
						Rs. A.		Rs. A.		Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	
Arakan ...	5,800	5,072	35,925	46,797	160	501 0	4,298	12,063 13	4,458	12,564 13	13,633 11	26,198 8	36,611 7 1/3	.....	6,209 0 1/2	42,820 8 1/2	.....	30,255 11 1/2	
Assam ...	6,875	7,702 1/2	16,309	30,886	1,581	4,885 12	4,163	7,226 9	5,694	12,112 5	1,314 11	13,427 0	35,648 2 1/4	1,610 0	1,816 0 1/4	39,074 2 1/2	.....	26,961 13 1/2	
Bangalore ...	17,880	22,051	28,910	68,841	1,541	4,483 2	14,746	24,152 7 1/2	16,287	28,615 9 1/2	7,175 3 1/2	35,790 13	57,648 9	3,814 0	2,794 4	64,256 13	.....	35,641 3 1/2	
Bengal ...	1,12,037	1,31,740	1,68,166	4,11,953	51,39	16,725 3 1/2	98,645	2,28,847 0 1/4	1,03,784	2,45,572 3 1/2	4,34,667 5 1/2	6,80,239 8 1/16	1,96,483 9	8,405 0	13,304 7	2,18,193 0	27,379 3 1/2	.....	
British Burmah	31,459	32,159	28,229	91,847	2,641	7,531 6	27,741	65,321 15	30,382	72,853 5	50,733 5	1,23,586 10	52,968 1	.....	2,385 12	55,353 13	17,499 8	.....	
Bombay ...	1,33,099	1,16,440	93,298	3,42,837	64,21	22,047 4	1,21,769	2,63,767 14 1/4	1,28,19	2,85 815 2 1/2	4,34,876 13	7,10,691 15 1/2	1,51,590 1	21,914 0	11,844 6 7/12	1,85,338 7 7/12	1,00,476 10 1/12	.....	
Ceylon ...	38,158	39,135	18,160	95,453	429	1,412 8	31,747	1,00,675 0	32,176	1,02,1 7 8	1,77,613 4	2,79,730 12	37,446 2 1/2	6,869 14	4,283 5 1/2	46,599 6 1/2	55,518 1 1/2	.....	
Dacca ...	7,832	6,420	47,913	62,165	373	799 0	5,411	12,165 5	5,634	12,964 5	1,712 1	14,676 6	25,579 12 7/12	2,190 0	1,890 13	29,960 9 7/12	.....	16,996 4 1/12	
Ganjam ...	30,712	31,515	42,0 0	1,04,257	702	1,910 8	27,082	50,757 1	27,734	52,667 9	9,744 5	62,411 14	65,139 5 1/12	4,382 7	4,482 11 1/2	74,004 8 1/12	.....	21,336 15 1/12	
Indore ...	23,307	26,711	18,836	68,854	1,173	3,302 10	19,906	28,331 1 1/2	21,079	31,633 11 1/2	1,896 7	33,530 2 1/2	48,092 14	450 0	3,786 4	52,329 2	.....	20,695 6 1/2	
Madras ...	49,880	50,724	1,01,006	2,01,620	2,290	6,058 13	44,189	97,325 2	46,479	1,03,383 15	1,54,582 10 1/2	2,57,966 9 1/2	82,355 15	3,942 0	5,200 2	91,498 1	11,885 14	.....	
Malabar ...	45,370	45,787	51,167	1,42,324	844	2,080 4	41,131	67,612 6 1/2	41,975	69,692 10 1/2	11,668 14 1/2	81,361 8 3/4	89,304 3 1/2	5,186 0	5,838 15 1/4	1,00,329 2 3/4	.....	30,636 8 1/2	
Nagpur ...	26,062	30,035	35,002	91,099	1,595	4,359 4	21,095	27,493 10 1/4	22,690	31,852 14 1/2	2,271 4	34,124 2 1/2	56,833 1	1,636 0	4,533 15	63,003 0	.....	1,150 1 1/2	
Punjab ...	45,940	66,024	32,525	1,34,489	9,145	30,746 1 1/2	32,108	50,658 8 1/12	41,253	81,404 10 1/2	33,732 5 1/2	1,15,136 15 7/12	90,947 0	3,142 7	10,630 8	1,04,719 15	.....	23 315 4 1/4	
Rajpootana ...	12,836	16,777	18,592	48,205	1,062	3,136 1	10,105	16,163 15 1/2	11,167	19,300 0 1/2	2,001 15 1/2	21,302 0	48,398 0	1,073 11	3,989 11	53,449 6	.....	34,149 5 1/2	
Scinde ...	41,966	42,831	4,354	88,651	2,660	12,771 10	35,669	1,26,222 10 1/8	38,329	1,38,994 4 1/8	32,599 12 1/2	1,71,594 1	69,464 14	1,260 0	3,967 2	74,692 0	64,302 4 1/2	.....	
Total ...	6,29,233	6,60,623	7,40,422	20,30,278	37,696	1,22,760 6 1/2	5,39,755	11,78,784 8 1/4	5,77,381	13,01,544 15 1/12	13,60,223 15 1/2	26,61,768 15 1/12	11,44,489 1 1/2	64,175 7	86,957 6 1/12	12,95,621 15 1/2	2,77,061 10 1/12	2,71,138 10 1/2	

B.

Statement showing the Number and Value of Messages transferred to and received from Railways during the year ending 31st March 1871.

NAMES OF RAILWAYS.	No. and value of messages transferred to Railways.		No. and value of messages received from Railways.	
	No.	Railway Share.	No.	Government Share.
		Rs. A. P.		Rs. A. P.
East Indian Railway	3,198	3,004 6 0	2,727	2,893 10 0
Eastern Bengal Railway	275	263 1 4	173	133 8 0
Calcutta and S. E. State Railway	4	4 8 0	.....	.....
Oudh and Rohilkund Ditto	40	37 8 0	105	87 10 8
Punjab Ditto	761	703 0 0	648	677 2 8
Delhi Ditto	879	790 4 0	941	1,102 1 4
Punjab and Delhi Ditto	724	665 8 0	775	839 2 0
Sindh Ditto	179	131 14 8	198	174 0 0
Bombay, Baroda, and Central India Railway	329	279 7 0	282	251 8 0
Great Indian Peninsula Railway...	3,330	2,628 13 0	1,830	1,662 4 0
Madras Ditto	2,499	2,141 4 4	1,799	2,638 0 8
Great Southern of India Ditto	1,097	999 2 0	804	1,138 5 4
TOTAL ...	13,315	11,648 12 4	10,282	11,597 4 8

C.

Statement showing the number and value of News Free Messages in each Division during the year 1870-71.

Months.	Arracan.		Assam.		Bangalore.		Bengal.		Bombay.		British Burmah.		Ceylon.		Dacca.		Gangam.		Indore.		Madras.		Malabar Coast.		Nagpore.		Punjab.		Rajpootana.		Sindh.		Total.		Remarks.
	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	
April 1870 ...	39	115	...	...	...	...	63	433	14	3,266	...	...	198	562	57	118	25	385	...	...	34	280	...	...	...	...	...	...	...	...	...	...	430	5,109	
May ,, ...	24	84	...	...	...	...	63	436	8	2,172	...	...	30	392	58	116	25	339	...	...	32	270	148	207	...	...	...	...	...	...	...	...	388	4,016	
June ,, ...	29	117	...	...	...	...	60	425	7	1,768	...	...	24	344	57	114	24	303	...	...	36	271	141	219	...	...	...	...	...	...	...	...	378	3,561	
July ,, ...	31	124	...	...	...	...	63	446	15	2,955	...	...	24	367	62	125	26	331	...	...	31	269	149	224	...	...	...	...	...	...	...	...	401	4,841	
August ,, ...	...	...	...	...	...	...	63	605	9	2,356	1	40	23	288	65	111	28	243	...	...	34	294	148	249	...	...	...	...	...	...	...	...	371	4,186	
September ,, ...	30	119	...	...	...	...	60	425	12	2,951	...	...	23	530	61	123	23	68	...	...	34	277	130	197	...	...	...	...	...	...	...	...	373	4,690	
October ,, ...	31	120	...	...	...	...	46	435	10	2,748	...	...	28	617	64	127	22	54	...	...	34	286	128	145	...	...	...	...	...	...	...	...	363	4,532	
November ,, ...	30	112	...	...	...	...	60	420	9	2,356	...	...	29	433	60	120	26	64	...	...	33	276	...	...	...	...	...	...	...	...	...	...	247	3,781	
December ,, ...	31	119	...	...	...	...	61	388	12	2,366	...	...	23	331	62	124	27	232	...	...	27	226	...	...	...	...	...	...	...	...	...	...	243	3,766	
January 1871 ...	31	99	...	...	...	...	60	261	10	2,736	...	...	19	238	63	126	23	232	...	...	32	271	...	...	...	...	...	...	...	...	...	...	238	3,963	
February ,, ...	28	56	...	...	...	...	56	337	8	2,744	...	...	12	144	56	128	24	192	...	...	20	215	...	...	...	...	...	...	...	...	...	...	204	3,816	
March ,, ...	30	107	...	...	...	...	60	360	14	2,367	...	...	20	172	62	124	25	132	...	...	26	252	...	...	...	...	...	...	...	...	...	...	237	3,514	
Total ...	334	1,172	...	...	...	...	715	4,961	128	30,785	1	40	453	4,418	727	1,456	298	2,525	...	...	373	3,187	844	1,241	...	...	...	...	...	...	...	...	3873	49,775	

D.

Statement showing the amount paid, and the amount which should have been paid for Reuter's Political *Press Messages sent from "Bombay," calculating the charges at the Indian and Indo-European terminal rates separately, together with the cost at Indian and Indo-European rates of the copies delivered free to Government Officials for the year* 1870-71.

Months.	Copies.		Number of message.	Average number of words.	Actual cost of paid for copies at concessionary rates.	(1) Valuable at international terminal rates.			(2) Valuable at ordinary inland rates.			Remarks.
	Paid for	Free.				Paid for copies (private.)	Free copies.	Total.	Paid for copies.	Free copies.	Total.	
					Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	
April 1870 ...	7	12	29	57	304 8	2,613 2	1,639 0	4,252 2	1,295 0	798 0	2,093 0	
May ,, ...	7	12	34	62	357 0	3,192 12	1,989 0	5,181 12	1,582 0	972 0	2,554 0	
June ,, ...	7	12	26	58	273 3	2,260 0	1,412 0	3,672 0	1,120 0	716 0	1,836 0	
July ,, ...	7	12	46	94	483 0	6,384 6	3,925 8	10,309 14	3,157 0	1,896 0	5,053 0	
August ,, ...	7/12	12	61	9	959 0	9,155 6	4,516 8	13,671 14	4,512 12	2,190 0	6,702 12	
September ,, ...	12	12	33	12	945 0	8,651 10	3,049 8	11,701 2	4,137 4	1,470 0	5,607 4	
October ,, ...	13	12	23	96	682 8	6,206 12	2,035 0	8,241 12	3,061 12	982 0	4,043 12	
November ,, ...	13	12	7	77	193 8	1,512 4	498 8	0,010 12	745 12	242 0	987 12	
December ,, ...	13	12	32	76	880 0	6,792 0	2,240 0	9,032 0	3,354 0	1,088 0	4,442 0	
January 1871 ...	13/14	12	29	74	816 0	6,918 10	2,167 8	9,086 2	3,030 4	934 0	3,964 4	
February ,, ...	14/13	12	32	96	964 8	10,499 10	3,308 8	13,808 2	4,225 0	1,300 0	5,525 0	
March ,, ...	13	12	32	68	842 0	7,250 12	2,395 0	9,645 12	2,912 0	952 0	3,864 0	
Total ...	.....	.....	.....	.....	7,700 0	71,437 4	29,176 0	1,00,613 4	33,132 12	13,540 0	46,672 12	

Statement showing the amount paid, and the amount which should have been paid, for Reuter's Political Press Messages sent from "Kurrachee," calculating the charges at the Indian and Indo-European terminal rate separately, together with the cost at Indian and Indo-European rates of the copies delivered free to Government Officials for the year 1870-71.

Months.			Copies.		Number of messages.	Average number of words.	Actual cost of paid for copies at concessionary rates.	(1) Value at International terminal rates.			(2) Value at ordinary Inland rates.			Remarks.
			Paid for.	Free.				Paid for copies (private.)	Free copies.	Total.	Paid for copies (private).	Free copies.	Total.	
							Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	
April	1870	...	9	12	14	56	189 0	1,437 4	757 0	2,194 4	774 0	372 0	1,146 0	
May	„	...	9	12	22	75	297 0	3,110 4	1,530 0	4,640 4	1,566 0	740 0	2,306 0	
June	„	...	9	12	18	62	243 0	2,198 10	1,081 8	3,280 2	1,107 0	528 0	1,625 0	
July	„	...	9	12	12	57	162 0	1,322 12	653 0	1,975 12	666 0	320 0	986 0	
August	„	...	$9\frac{8}{13}$	12	24	8	448 0	3,737 12	1,578 0	5,315 12	1,884 8	768 0	2,652 8	
September	„	..	13	12	29	73	819 8	6,738 4	2,217 0	8,955 4	3,355 4	1,074 0	4,429 4	
October	„	...	13	12	26	68	693 0	4,935 8	1,644 8	6,580 0	2,418 8	796 0	3,214 8	
November	„	...	13	12	46	68	1,225 0	8,650 8	2,863 0	11,513 8	4,251 8	1,408 0	5,659 8	
December	„	...	13	12	13	45	321 8	1,805 4	604 0	2,409 4	895 4	298 0	1,193 4	
January	1871	...	$\frac{14}{14}$	12	10	34	244 8	1,123 12	363 8	1,487 4	542 8	200 0	742 8	
February	„	...	*Nil.*											
March	„	...	*Nil.*											
	Total	...	...	...	...	...	4,642 8	35,059 14	13,291 8	48,351 6	17,460 8	6,504 0	23,964 8	

SUPPLEMENT TO THE GAZETTE OF INDIA, DECEMBER 23, 1871. 1693

POLITICAL MESSAGES.

ABSTRACT.

			Rs.	A.	P.
(1.)	Value at International Terminal Rate	...	1,48,964	10	0
	Cost amount paid by Reuter's Telegram Company at Concessionary Rate	...	12,342	8	0
	Loss	...	1,36,622	2	0
	Deduct value of free copies ...	...	42,467	8	0
	Net loss	...	94,154	10	0
(2.)	Value at Ordinary Inland Rate	...	70,637	4	0
	Cost amount paid by Reuter's Telegram Company at Concessionary Rate	...	12,342	8	0
	Loss	...	58,294	12	0
	Deduct value of free Copies	...	20,044	0	0
	Net loss	...	38,250	12	0

E.

RETURN of the number of paid Messages and Indian share of collections under heads of Inland and International for 1870-71.

MONTHS.	INLAND.		FOREIGN.																GRAND TOTAL.	
			INDO-EUROPEAN.				BRITISH INDIAN SUB-MARINE.				BRITISH INDIAN EXTENSION.				TRANSIT.				TOTAL.			
			Sent.		Received.		Sent.		Received.		Sent.		Received.		*Vid* Kurrachee.		*Vid* Bombay.					
	No.	Value.	No.	Indian share.	No.	Indian share.	No.	Indian share.	No.	Indian share.	No.	Indian share.	No.	Indian share.	No.	Indian share.	No.	Indian share.	No.	Indian share of Foreign messages.	Number of paid messages.	Indian collections.
		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		
April 1870	45,106	89,566 8½	1,432	8,388 11	1,749	8,650 1½	1,471	2,229 13	443	2,413 14	...	.....	...	.....	...	.....	...	.....	50,095	22,182 7½	50,201	1,11,748 15½
May ,,	42,553	84,093 1 1/12	1,510	9,346 11	1,742	8,491 1	1,414	2,366 8	448	2,797 4	...	.....	...	.....	...	.....	...	.....	5,114	22,941 8	47,667	1,07,034 9 1/12
June ,,	35,548	68,617 2½	1,660	9,027 10	1,442	7,967 0	1,194	2,147 11	640	3,274 2	...	.....	...	.....	...	.....	...	.....	4,936	22,416 7	40,484	91,033 9½
July ,,	36,730	70,462 1½	889	5,054 5	777	4,167 11½	2,160	8,016 14	1,911	9,372 10	...	.....	...	.....	...	.....	...	.....	5,737	26,611 8½	42,467	97,073 10½
August ,,	39,600	78,215 11 1/12	979	4,947 5	509	2,752 0½	2,298	8,407 13	1,633	8,864 10	...	.....	...	.....	...	.....	...	.....	5,389	24,971 12½	44,989	1,03,187 8 5/12
September ,,	38,331	75,337 10	1,441	5,864 12	798	4,255 10	1,293	6,710 3	1,203	6,735 12	...	.....	...	.....	...	.....	...	.....	4,735	23,566 5	43,066	98,903 15
October ,,	39,350	75,825 12 5/6	1,611	8,461 8	1,554	8,142 2½	1,114	4,129 14	845	4,761 0	...	.....	...	.....	...	.....	...	.....	5,124	25,494 8½	44,474	1,01,320 5½
November ,,	43,026	81,971 11¾	1,173	5,559 6	1,276	6,759 8½	1,989	7,863 14	1,109	6,197 7	...	.....	...	.....	...	.....	...	.....	5,426	26,380 3½	48,452	1,08,351 15¼
December ,,	44,967	83,235 2 6/12	1,524	8,311 9	2,676	14,269 8½	1,339	4,983 2	167	‡3,208 9	...	.....	...	.....	...	.....	...	.....	5,706	30,772 12½	50,673	1,14,007 14 1/12
January 1871	48,159	91,358 5 1/12	1,859	9,976 14	2,736	15,685 1½	1,098	3,615 4	210	1,277 2	237	1,108 12	209	1,145 0	459	2,469 7	585	2,806 11	7,393	38,084 3½	55,552	1,29,442 9 6/12
February ,,	45,960	86,225 14½	1,635	8,833 0	1,692	7,057 3	883	2,697 7	616	3,877 4	156	859 12	213	1,169 14	365	1,886 5	721	4,670 8	6,311	31,051 5	52,271	1,17,277 3½
March ,,	51,011	89,068 12 7/12	1,525	8,951 7	1,237	7,624 11	1,143	3,951 1	716	4,166 11	209	995 2	259	1,342 6	182	1,054 14	783	5,005 11	6,954	33,093 15	57,065	1,22,162 11 7/12
TOTAL ...	5,10,341	9,73,977 15 1/6	17,238	93,223 2	18,188	95,821 11½	17,245	*57,059 8	†9,941	56,948 5	632	2,963 10	681	3,657 4	1,006	5,410 10	2,098	12,482 14	67,020	3,27,567 0½	5,77,361	13,01,544 15 1/12

* Does not include value of messages sent from Bombay.

† Does not include number of messages to Bombay.

‡ Including recoveries of short credits, &c., of previous months.

F.

Statement showing the number and percentage of errors which occurred in the transmission of Messages for the year 1870-71.

	TOTAL NUMBER OF MESSAGES DESPATCHED.			TOTAL NUMBER OF MESSAGES CONTAINING ERRORS.			PERCENTAGE OF MESSAGES CONTAINING ERRORS.		
	Indian.	Foreign.	Total.	Indian.	Foreign.	Total.	Indian.	Foreign.	Total.
April 1870	50,322	5,095	55,417	253	73	326	·49	1·42	·58
May ,, ...	47,219	5,114	52,333	340	131	471	·71	2·55	·90
June ,, ...	40,516	4,936	45,452	313	103	416	·76	2·08	·91
July ,, ...	41,218	5,737	46,955	444	201	645	1·07	3·50	1·37
August ,, ...	43,642	5,389	49,031	412	141	553	·94	2·60	1·12
September ,, ...	42,540	4,735	47,275	417	86	503	·97	1·81	1·06
October ,, ...	43,838	5,124	48,962	274	68	342	·62	1·32	·69
November ,, ...	46,786	5,426	52,212	282	67	349	·60	1·23	·67
December ,, ...	48,808	5,706	54,514	369	72	441	·75	1·26	·80
January 1871	53,236	7,393	60,629	531	200	731	·99	2·70	1·20
February ,, ...	49,219	6,311	55,530	512	188	700	1·04	2·97	1·26
March ,, ...	54,869	6,054	60.923	453	132	585	·81	2·18	·95
TOTAL ...	562,213	67,020	629,233	4,600	1,462	6,062	·81	2·18	·96

G.

Statement showing the number and percentage of Complaints and the number of messages transmitted from April 1870 to March 1871.

I.—INLAND OR PURELY INDIAN MESSAGES.

F.—FOREIGN OR INTERNATIONAL ONES.

ABSTRACT OF COMPLAINTS.	1870-71.	April.		May.		June.		July.		August.		September.		October.		November.		December.		January.		February.		March.		Total number of Complaints.		Grand Total.
		I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	
1 Number, groundless		6	27	5	60	5	20	7	15	15	21	14	19	5	20	6	11	9	10	6	24	6	13	6	31	90	281	371
2 Number regarding messages slightly delayed in transmission, or which contained slight errors ...		5	3	11	1	0	1	4	53	3	0	1	0	4	0	3	1	4	0	9	0	2	2	3	1	37	69	99
3 Number regarding messages which did not reach their destinations in two-thirds of the postal time..		6	0	4	1	6	2	6	2	6	0	2	0	2	0	3	0	11	0	2	1	1	0	3	1	60	6	66
4 Number regarding mutilated messages		5	1	3	13	4	2	2	4	8	1	4	1	2	2	2	2	3	0	4	2	1	1	5	2	38	51	89
5 Number, miscellaneous		6	6	10	1	13	1	3	2	12	2	6	2	15	0	4	6	5	0	4	4	2	2	3	3	87	29	116
Total number of complaints ...		28	37	33	75	28	25	22	75	44	24	27	22	29	22	18	20	21	10	21	31	14	23	18	38	312	409	721
Number of service and private messages transmitted		45,166	5,066	43,553	5,114	36,646	4,936	36,730	5,737	39,600	5,389	38,331	4,795	39,250	5,124	43,025	5,636	44,997	5,706	46,139	7,333	46,900	6,311	51,011	6,064	5,10,341	67,020	5,77,361
Percentage of complaints		·06	·73	·07	1·46	·07	·50	·05	1·30	·11	·44	·07	·46	·07	·43	·04	·56	·05	·17	·04	·41	·03	·36	·03	·62	·06	·61	·13

H.

Return of the Number and Value of Service and Private Messages sent from each Presidency and Province during the year ending 31st March, 1871.

STATIONS.	SERVICE. No.	SERVICE. Value.	SERVICE. Total. No.	SERVICE. Total. Value.	PRIVATE. No.	PRIVATE. Value.	PRIVATE. Total. No.	PRIVATE. Total. Value.
BOMBAY PRESIDENCY.		Rs. A.		Rs. A.		Rs. A.		Rs. A.
Ahmedabad	230	641 0	...	.....	3,578	5,162 10	.....	.....
Ahmednuggur... ...	47	131 8	...	.....	576	938 12	.....	.....
Belgaum	171	492 4	...	.....	965	1,485 10	.....	.....
Bombay	2,464	8,026 2	...	.....	1,03,413	2,32,201 9¼	.....	.....
Broach	22	62 0	...	.....	1,561	2,614 12	.....	.....
Byculla	17	44 0	...	.....	908	1,643 9¼	...	.....
Carwar	78	156 0	...	.....	2,479	3,595 10	.....	.....
Coompta	4	12 0	...	.....	2,779	4,033 12	.....	.....
Deolali	823	2,378 0	...	.....	455	893 6	.....	.....
Dharwar	27	67 0	...	.....	1,097	1,798 1	.....	.....
Mahableshwar... ...	523	2,116 4	...	.....	834	1,322 0	.....	.....
Malabar Point... ...	7	21 10	...	.....	3	5 0	.....	.....
Maligaum	48	144 4	...	.....	241	343 3	.....	.....
Matheran	26	58 0	...	.....	396	661 0	.....	.....
Nasik	30	82 0	...	.....	407	643 14	.....	.....
Poona	1,611	6,119 1	...	.....	3,712	6,166 7	.....	.....
Sattara	33	92 0	...	.....	311	539 11	.....	.....
Surat	57	156 4	...	.....	1,930	2,783 10	.....	.....
Vingorla	63	114 0	...	.....	1,671	2,157 0	.....	.....
Virumgaum	4	11 0	...	.....	162	246 0	.....	.....
Ganesh Khind... ...	109	670 6	...	.....	103	236 14	.....	.....
Parell	33	213 0	...	.....	90	243 8	.....	.....
Total ...	6,427	21,807 11			1,27,671	2,69,715 14½		
			6,427	21,807 11			1,27,671	2,69,715 14½
NATIVE STATES UNDER THE GOVERNOR OF BOMBAY.								
Baroda	53	201 4	...	.....	699	1,883 6	.....	.....
Dossa	135	367 4	...	.....	644	1,143 1	.....	.....
Kolhapur	21	74 0	...	.....	223	508 4	.....	.....
Rajkot	127	444 12	...	.....	1,024	3,093 11½	.....	.....
Wadwan	3	12 13	...	.....	419	1,044 4	.....	.....
Total ...	349	1,100 1			3,009	7,122 10½		
			349	1,100 1			3,009	7,122 10½
PROVINCE OF SINDH.								
Hydrabad Sindh ...	320	911 4	...	.....	1,197	2,062 10	.....	.....
Jacobabad	124	617 12	...	.....	349	616 10	.....	.....
Kurrachee	1,158	8,360 6	...	.....	27,761	1,14,129 9½	.....	.....
Umrkot	33	97 12	...	.....	217	472 8	.....	.....
Kasmur	...	.....	...	.....	15	35 0	.....	.....
Shikarpur	91	252 0	...	.....	1,010	1,463 0	.....	.....
Sakkar	205	455 8	...	.....	2,287	3,348 0	.....	.....
Tarusha	3	5 0	...	.....	21	27 0	.....	.....
Total ...	1,934	10,699 10			32,857	1,22,154 5½		
			1,934	10,699 10			32,857	1,22,154 5½
MADRAS PRESIDENCY.								
Bellary	214	557 0	...	.....	1,748	2,972 8	.....	.....
Bahrampur	79	201 8	...	.....	3,114	5,459 14	.....	.....
Bezwara	21	40 0	...	.....	443	765 12	.....	.....
Bimlipatam	1	7 0	...	.....	3,521	6,347 3	.....	.....
Calicut	185	513 12	...	.....	6,389	9,340 7½	.....	.....
Calingapatam	3	13 0	...	.....	413	705 4	.....	.....
Cannanore	285	729 4	...	.....	2,308	3,600 2	.....	.....
Chicacol	18	43 4	...	.....	433	704 4	.....	.....
Coconada	123	262 0	...	.....	13,358	26,174 7	.....	.....
Cochin	6	6 0	...	.....	7,217	11,899 5	.....	.....
Cuddalur ...	10	34 0	...	.....	291	476 0	.....	.....

Return of the Number and Value of Service and Private Messages sent from each Presidency and Province during the year ending 31st March, 1871.—(Continued.)

Stations.	Service. No.	Service. Value.	Service. Total. No.	Service. Total. Value.	Private. No.	Private. Value.	Private. Total. No.	Private. Total. Value.
Madras Presidency,—(Continued.)		Rs. A.		Rs. A.		Rs. A.		Rs. A.
Dowladhwaram ...	103	223 8	...	.....	785	1,511 4	.....	.....
Guntoor	6	13 0	...	.....	2,316	3,171 4	.....	.....
Kurnool	68	148 8	...	.....	606	1,023 4	.....	.....
Madras	2,026	5,504 13	...	.....	31,422	72,714 1½	.....	.....
Mangolor	79	165 4	...	.....	2,922	4,405 3	.....	.....
Masulipatam	84	154 8	...	.....	1,681	2,797 6	.....	.....
Negapatam	107	223 0	...	.....	2,785	5,480 1½	.....	.....
Nellore	20	36 8	...	.....	359	606 12	.....	.....
Palamcotta	56	140 0	...	.....	1,061	2,235 5	.....	.....
Paumben	12	36 0	...	.....	484	833 4	.....	.....
Telcherry	29	92 0	..	.....	3,260	5,870 6	.....	.....
Tuticorin	13	36 0	...	.....	4,132	9,158 6	.....	.....
Utakamand	358	1,215 10	...	.....	1,712	2,691 5	.....	.....
Vellore	16	44 8	...	.....	388	521 10	.....	.....
Vizagapatam	166	530 12	...	.....	1,811	2,918 11	.....	.....
Vizianagram	17	62 0	...	.....	818	1,931 10	.....	.....
Total ...	4,105	11,032 11	4,105	11,032 11	95,777	1,86,347 15½	95,777	1,86,347 15½
Native States under the Governor of Madras.								
Allepi (Travancore) ...	...	.....	...	.....	2,863	4,513 13	.....	.....
Nagarcoil (Travancore) ...	...	.....	...	.....	302	611 2	.....	.....
Quilan (Travancore) ...	6	11 0	...	.....	890	1,604 12	.....	.....
Trivandram (Travancore) ...	10	25 8	...	.....	1,161	1,970 14	.....	.....
Total ...	16	36 8	16	36 8	5,216	8,700 9	5,216	8,700 9
Bengal Lieutenant-Governorship.								
Achipore	4	10 0	...	.....	390	3,253 8	.....	.....
Balasore	14	28 0	...	.....	636	1,100 0	.....	.....
Barrakpore	35	152 8	...	.....	510	1,222 13½	.....	.....
Bankipore	101	311 8	...	.....	983	1,928 6	.....	.....
Bardwan	24	47 0	...	.....	410	611 3	.....	.....
Burhee	71	279 8	...	.....	134	245 5	.....	.....
Cachar	285	1,352 14	..	.....	913	1,599 0	.....	.....
Calcutta	2,252	8,985 3½	...	.....	70,344	1,73,463 11½	.....	.....
Chittagong	83	266 0	...	.....	2,612	7,083 15	.....	.....
Comilla	27	71 0	...	.....	378	806 14	.....	.....
Casimpore	...	.....	...	.....	13	16 4	.....	.....
Cuttack	129	433 0	...	.....	1,753	3,246 0	.....	.....
Dacca	150	430 0	...	.....	2,060	3,668 8	.....	.....
Darjiling	85	275 14	...	.....	272	457 9	.....	.....
Dhubri	115	228 0	...	.....	310	473 8	.....	.....
Diamond Harbour ...	3	10 0	...	.....	208	360 5	.....	.....
Goalando	3	8 0	...	.....	151	223 12	.....	.....
Goalpara	109	248 0	...	.....	358	561 13½	.....	.....
Gowhatti	257	801 0	...	.....	869	1,510 6	.....	.....
Hooghly Point... ...	...	.....	...	.....	1,606	10,060 0	.....	.....
Jalpeegori	274	697 4	...	.....	295	601 8	.....	.....
Midnapore	49	106 8	...	.....	390	658 8	.....	.....
Mud Point	...	.....	...	.....	38	50 0	.....	.....
Purnea	7	23 0	...	.....	171	292 10½	.....	.....
Ramu	10	24 0	...	.....	197	366 0	.....	.....
Raneegunge	2	4 0	...	.....	185	271 12	.....	.....
Sahibgunge	34	70 12	...	.....	433	473 10½	.....	.....
Saugor Island	...	.....	...	.....	44	64 0	.....	.....
Shillong	126	385 4	...	.....	319	549 14	....	.....
Sylhet	127	467 8	...	.....	446	752 12	.....	.....
Total ...	4,376	15,715 11½	4,376	15,715 11½	87,428	2,15,973 8½	87,428	2,15,973 8½

Return of the Number and Value of Service and Private Messages sent from each Presidency and Province during the year ending 31st March, 1871.—(Continued.)

Stations.	Service. No.	Service. Value.	Service. Total. No.	Service. Total. Value.	Private. No.	Private. Value.	Private. Total. No.	Private. Total. Value.
Native State under the Lieutenant-Governor of Bengal.		Rs. A.		Rs. A.		Rs. A.		Rs. A.
Kooch Behar	146	407 0	...	.....	210	427 8	.....	.....
			146	407 0			210	427 8
North-Western Provinces.								
Agra	360	903 2	...	.....	4,878	6,810 7½	.....	.....
Allahabad	1,138	3,358 8	...	.....	3,605	5,674 8	.....	.....
Aligurh	31	58 8	...	.....	535	771 3½	.....	.....
Bareilly	175	393 0	...	.....	1,069	1,802 10	.....	.....
Benares	111	353 6	...	.....	2,261	4,449 0½	.....	.....
Cawnpore	261	503 0	...	.....	5,419	8,127 6½	.....	.....
Fathaguhrh	60	136 8	...	.....	932	1,341 8	.....	.....
Hardwar	20	48 0	...	.....	78	138 5	.....	.....
Meerat	320	667 13½	...	.....	2,826	3,965 13½	.....	.....
Mirzapore	31	91 8	...	.....	1,620	2,696 10	.....	.....
Muradabad	82	195 8	...	.....	776	1,322 2	.....	.....
Mussoorie	91	215 8	...	.....	1,041	1,604 1	.....	.....
Mattra	66	176 12	...	.....	849	1,448 9	.....	.....
Naini Tal	358	761 11	...	.....	880	1,440 2	.....	.....
Roorki	182	337 8	...	.....	368	565 7	.....	.....
Shahjahanpore ...	58	140 0	...	.....	441	620 2	.....	.....
Total ...	3,345	8,339 4½	3,345	8,339 4½	27,598	42,777 15½	27,598	42,777 15½
Punjab.								
Abbottabad	226	1,041 8	...	.....	322	538 4	.....	.....
Attok	26	54 0	...	.....	113	186 12	.....	.....
Umbala	417	1,105 10	...	.....	2,293	3,586 9½	.....	.....
Umritsar	78	210 0	...	.....	1,970	3,144 9	.....	.....
Delhi	226	520 8	...	.....	4,635	6,272 13½	.....	.....
Dera Dhoon	32	87 8	...	.....	715	1,327 11	.....	.....
Deraghazi Khan ...	243	638 8	...	.....	379	571 0	.....	.....
Dera Ismael Khan ...	268	891 4	...	.....	523	858 6	.....	.....
Ferozpore Arsenal ...	13	28 8	...	.....	92	149 3	.....	.....
Ditto Cantonment ...	21	44 8	...	.....	299	494 9	.....	.....
Hoti Mardan	137	589 0	...	.....	119	183 8	.....	.....
Jhelam	105	361 14	...	.....	343	621 4	.....	.....
Jullundhur	75	175 0	...	.....	781	1,496 8½	.....	.....
Kowsaoli	143	305 8	...	.....	578	1,018 8	.....	.....
Kathala	...	.....	...	.....	3	6 0	.....	.....
Kohat	123	405 0	...	.....	334	534 0	.....	.....
Lahore	1,354	4,076 4	...	.....	4,020	6,207 2	.....	.....
Lieut.-Governor's Camp ...	21	74 0	...	.....	22	28 0	.....	.....
Multan	150	393 8	...	.....	1,941	2,810 11	.....	.....
Murri	794	2,383 0	...	.....	1,298	2,295 3	.....	.....
Nowshera	72	187 0	...	.....	258	371 4	.....	.....
Peshawar	587	2,277 12	...	.....	1,350	2,368 5	.....	.....
Rajanpore	98	246 8	...	.....	186	300 12	.....	.....
Rawal Pindi	371	1,041 8	...	.....	1,284	2,106 10	.....	.....
Simla	3,007	12,952 9	...	.....	3,243	5,538 15	.....	.....
Wozirabad	...	.....	...	.....	2	3 0	.....	.....
Total ...	8,586	30,099 5	8,586	30,099 5	27,103	42,969 7½	27,103	42,969 7½
Central Provinces.								
Akola	126	374 0	...	.....	652	848 12	.....	.....
Omrawati	92	280 0	...	.....	6,787	8,798 4	.....	.....
Akote	6	11 0	...	.....	806	1,019 4	.....	.....
Bhasawal	4	10 0	...	.....	274	215 1	.....	.....
Damagadium	51	145 0	...	.....	137	329 12	.....	.....
Enchampilly	22	39 8	...	.....	102	172 0	.....	.....

Return of the Number and Value of Service and Private Messages sent from each Presidency and Province during the year ending 31st March 1871.—(Continued).

Stations.	Service. No.	Service. Value.	Service. Total. No.	Service. Total. Value.	Private. No.	Private. Value.	Private. Total. No.	Private. Total. Value.
		Rs. A.		Rs. A.		Rs. A.		Rs. A.
Central Provinces.—(Continued.)								
Hinganghât	3	11 0	...	.....	1,926	2.188 8	.....	.....
Jubulpur	338	910 0	...	.....	1,734	2,567 11	.....	.....
Jalgaom	1	6 0	...	.....	245	245 8	.....	.....
Kamthi	251	713 0	...	.....	1,173	1.712 5	.....	.....
Khangaum	18	38 8	...	.....	4,672	5,668 0	.....	.....
Khandwa	147	304 8	...	.....	461	630 13	.....	.....
Nagpur	496	1,396 12	...	.....	1,792	2,440 0½	.....	.....
Sioni	15	40 0	...	.....	97	154 4	.....	.....
Sironcha	19	66 0	...	.....	133	370 0	.....	.....
Total ...	1,589	4,345 4	1,589	4,345 4	20,991	27,360 2½	20,991	27,360 2½
Oudh.								
Fyzabad	197	295 8	...	.....	734	1,220 8	.....	.....
Lucknow	389	1,036 8	...	.....	3,062	5,073 12	.....	.....
Total ...	586	1,332 0	586	1,332 0	3,796	6,294 4	3,796	6,294 4
British Burmah.								
Aeng	7	21 0	...	.....	80	122 8	.....	.....
Akyab	199	384 0	...	.....	3,925	11,482 5	.....	.....
Henzada	114	210 0	...	.....	513	810 0	.....	.....
Moulmein	115	273 0	...	.....	3,601	7,376 7	.....	.....
Moungdu	10	28 0	...	.....	89	150 0	.....	.....
Myanoung	56	88 0	...	.....	121	243 2	.....	.....
Myoo, Left Bank ...	...	.....	...	.....	28	40 0	.....	.....
Myoo, Right „ ...	...	.....	...	.....	40	47 0	.....	.....
Pabru	1	2 0	...	.....	39	60 0	.....	.....
Padeng	1	2 0	...	.....	58	75 8	.....	.....
Prome	180	363 0	...	.....	1,979	32,34 6	.....	.....
Rangoon	1,358	4.225 2	.....	.....	16,753	45,279 5	.....	.....
Shoaygheen	124	293 0	.....	.....	615	930 4	.....	.....
Thyetmyo	405	1.136 4	...	.....	2,101	3,721 15	.....	.....
Tounghoo	288	941 0	...	.....	1,967	3,651 0	.....	.....
Tounghup	23	66 0	...	.....	97	162 0	.....	.....
Total ...	2,801	8,032 6	2,801	8,032 6	32,039	77,385 12	32,039	77,385 12
Maisur and Coorg.								
Bangalore	314	314 12	...	.....	3.708	5.519 10	.....	.....
Mercara	30	79 8	...	.....	751	1,156 1	.....	.....
Maisur	25	63 4	...	.....	1,102	1,675 3	.....	.....
Total ...	369	957 8	369	957 8	5,571	8,350 14	5,571	8,350 14
Hyderabad Province.								
Hyderabad Deccan ...	251	687 8	...	.....	3,269	5,822 4½	.....	.....
Secunderabad	268	865 0	...	.....	1,116	2,125 10	.....	.....
Total ...	519	1,552 8	519	1,552 8	4,385	7,947 14½	4,385	7,947 14½
Rajputana Agency.								
Ajmir—(British) ...	199	576 0	...	.....	3.024	4,943 14	.....	.....
Beawar—(Ditto) ...	27	53 0	...	.....	658	1,025 8	.....	.....
Bhurtpore	94	395 10	...	.....	288	779 8	.....	.....
Erinpura	42	111 0	...	.....	422	863 0	.....	.....
Jeypur	99	376 3	...	.....	3,797	5,275 12½	.....	.....
Mount Abu	193	534 0	...	.....	414	590 0	.....	.....
Nasirabad	240	625 4	...	.....	641	1,070 12	.....	.....
Total ...	894	2,671 1	894	2.671 1	9,244	14.548 6½	9,244	14,548 6½

Return of the Number and Value of Service and Private Messages sent from each Presidency and Province during the year ending 31st March 1871.—(Concluded).

Stations.	Service. No.	Service. Value.	Service. Total. No.	Service. Total. Value.	Private. No.	Private. Value.	Private. Total. No.	Private. Total. Value.
		Rs. A.		Rs. A.		Rs. A.		Rs. A.
Ceylon.								
Colombo	102	410 14	...	.....	13,208	37,456 15	.....	.....
Dambool	2	2 0	...	.....	44	58 4	.....	.....
Galle	84	415 5	...	.....	12,454	53,660 12	.....	.....
Jafna	15	54 0	...	.....	951	2,207 8	.....	.....
Kandi	99	215 5	...	.....	3,410	4,738 11	.....	.....
Manar	13	29 0	...	.....	295	496 8	.....	.....
Newer Ellia	25	44 8	...	.....	807	1,047 6	.....	.....
Trincomalli	89	271 8	...	.....	578	1,009 0	.....	.....
Total ...	429	1,442 8	429	1,442 8	31,747	1,00,675 0	31,747	1,00,675 0
Central India Agency.								
Beora	3	18 0	...	.....	165	312 0	.....	.....
Boorhanpore	6	14 0	...	.....	104	133 8	.....	.....
Burnuggur	1	3 0	...	.....	471	620 0	.....	.....
Dhulia	70	265 0	...	.....	428	686 14	.....	.....
Goona	29	73 4	...	.....	248	474 12	.....	.....
Gwalior	20	39 0	...	.....	1,020	2,031 6	.....	.....
Indore	236	645 8	...	.....	7,750	10,987 9	.....	.....
Jowra	1	2 0	...	.....	1,007	1,152 12	.....	.....
Mhow	372	1,034 4	...	.....	865	1,416 15	.....	.....
Morar	179	472 6	...	.....	674	1,079 4	.....	.....
Mandisur	4	8 0	...	.....	2,458	3,175 4	.....	.....
Nimach	152	452 0	...	.....	1,363	2,007 4½	.....	.....
Rutlam	8	22 0	...	.....	2,804	3,331 4	.....	.....
Shajapore	19	59 0	...	.....	261	458 4	.....	.....
Sipri	26	51 0	...	.....	137	229 6	.....	.....
Burwai	5	14 0	...	.....	14	25 0	.....	.....
Total ...	1,131	3,172 6	1,131	3,172 6	19,76 9	24,121 6½	19,769	28,121 6½
Foreign States.								
Goa	...	.....	...	.....	936	1,460 4	.....	.....
Pondicherry	4	17 0	...	.....	4,408	10,450 9	.....	.....
Total ...	4	17 0	4	17 0	5,344	11,910 13	5,344	11,910 13
Grand Total ...			37,606	1,22,760 6½			5,39,755	11,78,784 8½

J.

RETURN of the Number and Value of Service and Private Messages transmitted during the year 1870-71, *showing also the increase and decrease on the year* 1869-70.

DIVISIONS.	NUMBER OF PAID MESSAGES AND INDIAN SHARE OF COLLECTIONS, 1870-71.						NUMBER OF PAID MESSAGES AND INDIAN SHARE OF COLLECTIONS, 1869-70.						INCREASE.						DECREASE.					
	SERVICE.		PRIVATE.		TOTAL.		SERVICE.		PRIVATE.		TOTAL.		SERVICE.		PRIVATE.		TOTAL.		SERVICE.		PRIVATE.		TOTAL.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.		Rs. A.
Arakan ...	160	501 0	4,298	12,063 13	4,458	12,564 13	93	393 0	3,719	12,109 6	3,812	12,502 6	67	108 0	579	.....	646	108 0	...	.....	...	45 9	...	45 9
Assam ...	1,531	4,885 12	4,163	7,226 9	5,694	12,112 5	1,203	3,860 10	3,692	7,404 0	4,895	11,268 10	328	1,025 2	471	.....	799	1,025 2	...	.....	...	181 7	...	181 7
Bangalore ...	1,541	4,463 2	14,746	24,152 7½	16,287	28,615 9½	1,002	3,138 4	9,355	17,388 4	10,357	20,526 8	539	1,324 14	5,391	6,764 3½	5,930	8,089 1½	...	.....	...	.....	...	.....
Bengal ...	5,139	16,725 3½	98,645	2,28,847 0 1/6	103784	2,45,572 3½	62,79	21,442 11	78,277	1,97,422 15	84,556	2,18,865 10 1/12	...	.....	20.36	31,424 1 1/12	20,36	31,424 1 1/12	1,140	4,717 7½	...	.....	1,140	4,717 7½
Bombay ...	6,421	22,047 4	121769	2,63,767 14½	128190	2,85,815 2½	6,223	27,264 2	84,716	2,02,117 7½	90,939	2,29,381 9½	198	.....	37,053	61,650 6½	37,251	61,650 6½	...	5,216 14	...	.....	...	5,216 14
British Burma	2,641	7,531 6	27,741	65,321 15	30,382	72,853 5	2,236	6,333 0	22,672	55,738 14½	24,908	62,071 14½	405	1,198 6	5,069	9,583 0½	5,474	10,781 6½	...	.....	...	.....	...	.....
Ceylon ...	429	1,442 8	31 747	1,00,675 0	32,176	1,02,117 8	334	834 12	25,001	78,824 3½	25,335	79,659 15½	95	607 12	6,746	21,850 12½	6,841	22,458 8½	...	.....	...	.....	...	.....
Dacca ...	273	799 0	5,411	12,165 5	5,684	12,964 5	248	803 8	4,131	11,953 8	4,379	12,757 0	25	.....	1,280	211 13	1,305	211 13	...	4 8	...	.....	...	4 8
Ganjam ...	702	1,910 8	27,033	50,757 1	27,734	52,667 9	694	1,897 4	24,224	54,590 4	24,918	56,487 8	8	13 4	2,808	.....	2,816	13 4	...	.....	...	3,933 3	...	3,933 3
Indore ...	1,178	3,302 10	19,906	28,331 1½	21,079	31,633 11½	1,029	5,390 8	21,029	32,842 13	22,058	38,233. 5	...	.....	...	.....	...	.....	456	2,087 14	1,303	4,511 11½	1,759	6,599 9½
Madras ...	2,299	6,058 13	44,189	97,325 2	46,479	1,03,383 15	2,217	7,411 2	35,197	80,115 5	37,414	87,526 7½	78	.....	8,993	17,209 12½	9,068	17,209 12½	...	1,552 5	...	.....	...	1,552 5
Malabar ...	844	2,080 4	41,131	67,612 6½	41,975	69,692 10½	732	2,012 0	34,663	64,999 7	35,395	67,011 7	112	68 4	6,408	26,123 15½	6,580	2,681 0½	...	.....	...	.....	...	.....
Nagpur ...	1,596	4,369 4	21,095	27,393 10½	22,690	31,852 14½	2,852	8,712 7	21,026	34,997 1	23,878	43,709 8	...	.....	69	.....	69	.....	1,257	4,353 3	...	7,503 6½	1,257	11,856 9½
Punjab ...	9,145	30,746 1½	32,108	50,658 8 1/12	41,253	81,404 10½	9,413	32,306 7	27,675	51,536 8½	37,088	83,842 15½	...	.....	4,433	.....	4,433	.....	283	1,560 5½	...	877 15 5/12	283	2,433 5 1/12
Rajputana ...	1,062	3,136 1	10,105	16,163 15½	11,167	19,300 0½	1,345	3,940 12	11,349	19,709 6	12,694	23,650 2	...	.....	...	.....	...	.....	283	804 11	1,244	3,545 6½	1,527	4,350 1½
Sindh ...	2,660	12,771 10	35,669	1,26,222 10½	38,329	1,38,994 4½	2,903	11,851 13	38,309	1,51,294 3½	412182	1,63,146 0½	...	919 13	...	.....	...	919 13	243	.....	2,040	25,071 9	2,283	25,071 9
Total ...	37,606	1,22,760 6½	539755	11,784 8½	577361	13,01,544 15 5/12	39,403	1,37,592 4	445215	10,73,047 11	484618	12,10,639 15 1/12	1,850	5,285 7	99,727	1,51,307 0 1/12	101,577	1,56,572 7 1/12	3,647	20,097 4½	5,187	44,570 3 7/12	8,834	65,667 7 1/12
News-free Messages					3,873	49,775 0																		
GRAND TOTAL ...					581234	13,51,319 15 5/12							...	.....	94,540	1,05,736 13½	94,540	1,05,736 13½	1,797	14,831 13½	...	.....	1,797	14,831 13½

TOTALS OF NET INCREASE AND DECREASE ON THE PRECEDING YEARS 1869-70 ... ...

NOTE.—This Return does not include collections other than those belonging to the Government of India.

,, Under-charges recovered during the year, Rs. 4,906-5, included in the collections of the Offices from which recovery has been made.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE AND COMMERCE.

REPORTS ON THE STATE OF THE SEASON AND PROSPECTS OF THE CROPS.

GENERAL REMARKS.—The rice crops have been harvested generally throughout India, with the exception of Coorg.

All through Central India, Oudh, and the Punjab, anxiety is felt regarding the rubbee crops, which have suffered in parts for want of the usual winter showers. The weather in all these provinces is reported to be cloudy and unsettled.

In British Burmah, Madras, and Bengal, the crops are reported to be fair and promising, though, in a portion of the Cuttack country between the Chilka lake and the sea, there has been extensive failure, and some apprehension of distress exists.

The cotton prospects continue to be discouraging in Khandeish, Nassick, and the Deccan, and to some extent in the Southern Mahratta Country. The accounts from other parts of Bombay are, on the whole, favourable.

Cattle disease has appeared in the neighbourhood of Mundla and Jubbulpore, and in a limited area in the Punjab.

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
MADRAS ...	Ganjam ...	December 17 ...	*Nil.*	December 21 ...	Water supply failing in places; migration from tract suffering from drought; market well supplied; health good; prices high but slightly falling.	Government considers the promise of the season to be good excep tin parts of the Northern Circars. The markets are well supplied by local produce or imports. Prices are rising generally owing to the demand for distant markets, and in the North from partial failure of crops.
	Vizagapatam ...	„ 20 ...	*Nil.*	.....	Markets well supplied; health good; prices slightly rising.	
	Kistna ...	„ ...	*Nil.*	.....	Dry crop good; wet crops not satisfactory in parts; markets fairly supplied; prices steady; large exports to Hyderabad Country.	
	Kurnool ...	„ ...	*Nil.*	.....	Dry crops fairly good; wet crops suffering in parts; prices have slightly fallen.	
	Negapatam ...	„ ...	3·53	.....	Prospects favorable; prices rising.	
	Trichinopoly ...	„ ...	2·26	.....	Crops in good order; harvest below the average; prices rising.	
	Calicut ...	„ 19 ...	0·66	.....	Prospects good; prices low but rising.	
BOMBAY AND SIND ...	Hyderabad (Sind) ...	„ ...	*Nil.*	December 21 ...	Districts healthy; no cattle disease.	
	Kurrachee ...	„ 20 ...	...	.....	Agricultural reports favorable, but cotton has suffered from frost. Indus at low level	
	Shikarpore ...	„ ...	...	.....	Cotton indifferent.	
	Jacobabad ...	„ ...	...	.....	Cotton fair.	
	Goozerat ...	„ ...	*0·03	.....	Cotton good.	
	Khandeish ...	„ ...	*Nil.*	.....	Cotton good; late crops favorable, slightly damaged in Broach by cloudy weather.	* In Ahmedabad.
	Nassick ...	„ ...	...	.....	Weather cooler; grain crops middling; cotton bad.	
	Deccan ...	„ ...	...	.....	Early crops middling; late not flourishing; cotton prospects bad.	
	Southern Maratha Country	„ ...	...	.....	Cotton prospects discouraging; late crops failed in places and withering.	
					Cotton generally middling; late crops withering in Kulladghee; elsewhere partially good.	
BENGAL ...	Dacca Division ...	December 6 ...	*Nil.*	December 20 ...	Rice nearly all cut; winter crops promise well.	
	Patna „ ...	„ ...	„	„ ...	All going on well.	
	Burdwan „ ...	„ ...	„	„ ...	Amun reaped. Winter crops good.	
	Cuttack „ ...	„ ...	„	„ ...	Prospects of crops generally good. Almost total failure has, however, been reported from Parikood, Malood. and Budgerkote between the Chilka Lake and the sea. People very badly off, with neither food nor money to buy.	Loan to Parikood Rajah for Rs. 10,000 applied for by the Commissioner to be expended on works and improvements. Advance of Rs. 1,000 on this account has been sanctioned.
N. W. PROVINCES ...	....	.....	*Nil.*	December 21 ...	Crops as before.	
PUNJAB ...	Delhi ...	December 20 ...	*Nil.*	„ ...	Weather cloudy; rain much wanted.	The weather has been cloudy for the last few days; a good general fall of rain now would be of inestimable value.
	Umballa ...	„ ...	*Nil.*	.....	Rain much wanted; agricultural prospects gloomy.	
	Jullundhur ...	„ ...	*Nil.*	.....	A good fall now would be in time for crops on favorable soils.	
	Lahore ...	„ ...	*Nil.*	.....	Season for sowings on unirrigated lands almost past; great scarcity of fodder.	
	Mooltan ...	„ ...	*Nil.*	.....	Agricultural prospects same as before; cattle disease prevails in Tehsil Serai Sidhu.	
	Rawul Pindee ...	„ ...	*Nil.*	.....	Crops suffering.	
	Peshawur ...	„ ...	*Nil.*	.....	Rubbee sowings progressing.	
OUDH ...	Lucknow and Fyzabad ...	„ ...	*Nil.*	December 21 ...	... ...	The Chief Commissioner observes that the rubbee prospects throughout the province are favorable. The usual Christmas rain is wanted in parts. In the meantime the young wheat is being irrigated. Weather somewhat cloudy.
CENTRAL PROVINCES ...	Raipore ...	December 18 ...	*Nil.*	December 21 ...	Rubbee prospects depend on the usual winter rains: should these fail a very short crop will be obtained.	
	Belaspore ...	.....	*Nil.*	.....	Occasionally cloudy; rice nearly harvested; kodo, oilseeds and others reaping; rubbee crops require rain.	
	Sumbulpore ...	.. ...	*Nil.*	.....	Rice harvest much below the average.	
	Nagpore ...	December 20 ...	*Nil.*	.....	Cloudy weather for some days has affected the khureef and rubbee crops; jowaree and tur harvest poor; rice partially failed; rubbee wheat in some places drying for want of moisture; gram and lak slightly injured; prices of grain falling.	In the Nagpore and Chutteesgurh Divisions the rubbee crops will fall short of the average even if rain comes; it has held off too long. In the Jubbulpore and Nerbudda Divisions prospects are more favorable, but rain is wanted everywhere.
	Wurdha ...	....	...	.....	Khureef crops fair; cotton good; some anxiety for rubbee crops from absence of rain.	
	Jubbulpore ...	December 20 ...	*Nil.*	.....	Prospects of rubbee in good soils promising, but rain is needed; weather cloudy. Cattle-disease prevalent in Mundla and Jubbulpore.	

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
C. Provinces—*contd.* ...	Hoshungabad ...	December 20 ...	*Nil.*	.....	Prospects continue favorable; a little rain would do good.	
	Baitool ...	.....	...	.....	Same as above.	
	Nimar ...	.....	...	.....	Khureef good, rubbee bad.	
	Nursingpore ...	.....	...	.....	The want of rain and the cloudy weather are affecting the rubbee crops.	
	East Berar ...	December 21 ...	*Nil.*	December 21 ...	In the southern portion of Oomrawuttee District the Commissioner says he sees the rubbee crops withering. The short fall of rain, absence of dew, and the recent great heat are destroying them. However, the percentage of rubbee to the total cultivation is small. In the Woon District also, in the north of the district, prospects fail. Christmas rains are hoped for.	
Hyderabad Assigned Districts ...	West Berar ...	" 18 ...	"	" 20 ...	No rain, and consequently no improvement in agricultural prospects. Khureef almost reaped. Rubbee crops suffering from want of rain.	
Central India ...	Indore ...	December 20 ...	*Nil.*	" 21 ...	Prospects in Malwa are fair, but southwards and below the Vindyhas the want of rain is much felt, and the wells have little in them.	
	Gwalior ...	"	...	.....	Weather changeable; rain wanted.	
	Rutlam ...	.....	...	.....	No return.	
	Baghelcund ...	.....	...	.....	Crops in good condition.	
	Akyab ...	December 20 ...	0·7	December 21 ...	No change in crops.	
British Burmah ...	Rangoon ...	" ...	*Nil.*	.....	Fair.	
	Thayetmyoo ...	" ...	*Nil.*	.....	No alteration.	
	Tounghoo ...	" ...	0·16	.....	Most part of crops reaped; no damage since last report.	
	Amherst ...	" ...	*Nil.*	.....	Crops favorable; raggi harvested; paddy being reaped.	
	Bangalore ...	" 21 ...	*0·25	December 21 ...		*Very little rain in the district and only twenty-five cents in the Bangalore Cantonment.
Mysore and Coorg ...	Mysore ...	" 19 ...	*Nil.*	.....	Crops thriving throughout the district.	
	Coorg ...	" 21 ...	*Nil.*	.....	Paddy ripening fast and a good crop generally expected; reaping has commenced in some parts of South Coorg; horse and Bengal gram crops thriving; coffee berries being picked on European estates.	Agricultural prospects good.

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OFFICIAL PAPERS.

A SUPPLEMENT *to the* GAZETTE OF INDIA *will be published from time to time, containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.*

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GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

REGARDING THE EXTENSION OF THE INDUS VALLEY RAILWAY FROM ROHREE TO KOTREE.

Report on Railway Communication in the Indus Valley between the present Terminus of the Sind Railway at Kotree and Rohree.

Agreeably to the instructions conveyed in the Government Resolution No. 202—3R, dated 9th February 1871, by the Government of India, and the subsequent orders of the Bombay Government, we have the honor to submit our report upon Railway communication in the Indus Valley between Kotree and Rohree.

2. The Committee held its first regular meeting at Kotree on the 25th March, but, for some time previous, each of the members was employed in collecting information bearing upon the subject, in the Railway, Revenue, Public Works, and Irrigation Departments.

Collection of statistical information.

3. The Committee proceeded up the Indus on the 27th March in the steamer *Outram*, which was placed at their disposal by Captain Wood, the Agent of the Sind Railway. After examining the Sun River crossing, and the hills near Sehwan, which form the only obstacles on the right bank of the Indus, the Committee returned to Kotree. Opportunity was also taken to examine the country in the vicinity of Hydrabad, the site proposed for the bridge across the Indus at Kotree, and the general character of the river near Sehwan, and the feasibility of bridging it there. After obtaining all the information on record respecting the Indus boat traffic, the members of the Committee proceeded to Kurrachee to complete the necessary statistical information, by reference to the records of the Commissioner in Sind, the Collector of Customs, the Deputy Consulting Engineer, and the Agent of the Sind Railway.

Committee proceeded up the Indus. Examination of the hills at Sehwan, and sites for bridges over the Indus.

4. At Kurrachee we had the opportunity of meeting Sir William Merewether and learning his views on the general question of railway communication in the Indus Valley.

Meeting with Sir William Merewether.

5. We received great aid from Captain Wood, the Agent, and Mr. Newnham, the Chief Engineer, of the Sind Railway, who furnished us with the survey plans of the different lines of railway and other information, and we take this opportunity of recording our acknowledgments.

Assistance in collecting information afforded by Captain Wood, the Agent, and Mr. Newnham, the Chief Engineer, of the Sind Railway.

6. We will now proceed to report the result of our investigation of the question of railway communication. Before doing so, however, it will be desirable to give a brief description of the province and remark upon the improvement which has taken place in its revenues and foreign trade.

Brief description of the province of Sind.

7. The province of Sind is situated between the parallels 23° and 29° North Latitude, and 67° and 70° East Longitude. Its mean length from north to south is about 300 miles, mean breadth from east to west about 170 miles, and its area may be roughly stated at 50,000 square miles.

The area.

8. Shut in between a vast desert on the east and a lofty mountain range on the west, its southern boundary a low sea coast, studded with shoals and mud banks, and containing but one harbour capable of sheltering square-rigged vessels, the province lies under no small disadvantage of situation. In respect of climate it is even more unfavorably circumstanced, lying, as it does, just outside the track of the south-western monsoon and receiving but a scanty and uncertain rainfall.

Disadvantage it labors under from scarcity of rain.

9. One great natural advantage, however, it possesses in being traversed by the Indus throughout its entire length. The river is at once an unfailing source of irrigation and a highway both for local traffic and for that which is carried on between north-western India and the sea.

The River Indus an unfailing source of irrigation, and a highway for traffic.

10. The general direction of the course of the Indus in Sind is from north to south, and slightly west. So winding is it that the navigable channel is perhaps little short of 550 miles between Kusmore and the sea, the direct distance between the two points being about 380 miles. The range of irrigation is far from extensive. On the right bank as far south as Sehwan, a distance of 220 miles, the irrigated area varies in width from 20 to 50 miles extending up to the frontier, and in some places beyond it,* between Kusmore and Khyra Ghurhee, and below the latter point, reaching to the base of the western hills. At Sehwan the river touches the hilly tract of lower Sind, and thenceforth closely skirts it till within 40 or 50 miles of the sea. Along the lower portion of the Indus the irrigated land is a mere strip, varying in width from 1 to 5 or 6 miles. Below Tatta, indeed, it widens considerably, but the area of cultivation between that point and the coast is very small.

Winding course of the river, and extent of irrigation on the right bank.

* The Biggaree Canal supplies water to the lands of the Khan of Khelat, adjoining the Jacobabad Talooka.

11. On the left bank the area available for irrigation is limited by a tract of sand hills which extends almost from north to south of Eastern Sind. The space between these sand hills and the river varies in North Sind from 15 to 25 miles in width, but, from a point nearly opposite Sehwan, it gradually becomes broader, extending in some places to 60, in others to nearly 100 miles from the river, contracting again gradually as the sea coast is approached.

Extent of irrigation on the left bank.

12. The area of land dependent on rain bears a very small proportion to that under irrigation. Such land is confined, for the most part, to the base of the hills on the right bank, and, on the left bank, to the districts in the south-east of the province lying beyond the limits of irrigation.

Comparatively small area of land dependent on rain.

13. The population of Sind is extremely sparse. Unhappily we have no means of judging whether it has increased to any material extent since the province came under British rule. The only census ever taken was in the season 1856-57, but the agency employed was totally inadequate to the purpose, and no sufficient check was kept on the returns, which, in consequence, are regarded as very untrustworthy. The population is now estimated at 1,730,323, or about 35 to the square mile. It is distributed through the various districts as follows :—

Population.

Kurrachee	340,000
Hydrabad	566,865
Shikarpoor	513,458
Frontier, Upper Sind	85,000
Thurr and Parkur	225,000
TOTAL ...	1,730,323

The above estimate omits the territory of His Highness Meer Ali Moorad of Khyrpoor, as to which no information on this subject is forthcoming. Seventeen years ago an experienced officer in Upper Sind estimated the population of Khyrpoor at less than 50,000, and he stated that it was then decreasing. The numbers were perhaps understood, but it is known that some emigration has taken place from the territory of the Meer, that he is opposed to much extension of cultivation, and that his revenue has fallen off. It may, therefore, be assumed that the present population does not exceed 50,000.

14. The province being almost entirely dependent for the produce of its soil upon irrigation, the progress which this has made under our rule is obviously a most important point for consideration in reviewing the general condition of the country. The question, however, is too large a one for any but the most cursory notice in the present report. It may suffice to say that irrigation is as yet in a very backward condition, and that much remains to be done, both as regards increasing the supply of water, and in regulating that which is now provided.

Importance of irrigation, and its backward condition.

15. Highly satisfactory evidence of the steady progress of the province, notwithstanding the adverse conditions of climate, population, and irrigation with which it has to contend, is afforded by the state of the revenue. The increase in all branches of revenue is very remarkable. The gross land revenue has risen from Rs. 28,30,282 in 1853-54, to Rs. 46,37,292 in 1869-70, an increase of Rs. 18,07,010, or, comparing the average of the three first, Rs. 31,44,015, to that of the three last, Rs. 43,84,747, the increase has been 39 per cent. It has averaged during the last ten years* Rs. 41,87,457, during the last five years Rs. 42,11,725, during the last four years Rs. 43,41,328. Again, comparing the average revenue of the last nine years with the average revenue of the eight† preceding years, we find the former exceed the latter as follows :—

Satisfactory evidence of the steady progress of the province afforded by the state of the revenue.

	Rs.
Average revenue of nine years ending 1869-70	43,70,575
Ditto of eight years ending 1860-61	33,78,825
Difference ...	9,91,750

an increase of nearly 30 per cent.

* Cultivation of Government land has increased in this period as follows :—

Cultivated land in 1869-70 ...	2,171,770
Ditto in 1860-61 ...	1,349,449
Excess in 1869-70 ...	822,321

or nearly 60 per cent.

† That is for a period commencing with 1853-54. No longer period is taken, as the revenue in that year was largely increased by the resumption of territory from Meer Ali Moorad, and the previous smaller amounts would be of no use for purposes of comparison.

16. Judging from the rate of progress exhibited by these figures, we may expect the land revenue to rise in the next ten years to nearly Rs. 55,00,000, and should a more liberal expenditure on irrigational works be adopted, even this estimate will probably fall short of actual results.

Probable increase in land revenue during the next ten years.

17. In the same period of seventeen years the sayer revenue, including customs, has risen from Rs. 3,99,784 in 1853-54, to Rs. 20,32,907 in 1869-70, that is to say, it has been more than quadrupled. The principal items of the sayer revenue, omitting "Customs," which require separate notice, are excise, stamps, assessed taxes, and forest receipts. The immense increase above recorded is, therefore, a most convincing proof of the great advance in prosperity made by the province during the period under review.

The sayer revenue, and its rapid growth.

18. The customs revenue has increased from Rs. 48,361 in 1853-54 to Rs. 4,03,885 in 1869-70,—an increase of Rs. 3,55,524, the revenue of the latter year being considerably more than seven times that of 1853-54. The chief articles of import are piece goods, metals, and sugar, and of export, cotton, wool, oilseeds, grain and pulse, and dyes. Of these the bulk of the cotton is supplied by the Punjab, the wool almost entirely by the countries beyond our North-West Frontier. The oilseeds and grain are jointly contributed by the Punjab and Sind, the share of the latter being very considerable.

The customs revenue, and its extraordinarily rapid growth. Principal articles of import and export.

Railway communication.

19. We may now return to the railway communication.

20. Great difficulty has been met with in determining the commercial advantages of the different railway lines from the absence of complete records of the traffic on the Indus.

Want of complete records of the traffic on the Indus.

21. A statement (Appendix C) showing the river trade at Sukkur from 1856 to 1862 and 1865 to 1868 is attached. This statement was prepared by Mr. Howe when in charge of the Boat Department at Sukkur, and is useful as far as it goes; and it is greatly to be regretted that the same information was not recorded for the whole of the years from 1856 up to the present time. The information, however, is defective in two important particulars: it does not show the nature of the merchandize, and what portion of it was really through traffic, but landed and embarked again for Lower Sind, or for export from the ports of the province. No doubt, some was actually used at Sukkur, or despatched inland, and, in addition to what was re-shipped, produce from the districts in the vicinity of Sukkur was despatched up and down river. It is impossible, therefore, to see how much of the merchandize, which appears under the head of "Boats leaving the Bunder with merchandize," was through traffic and how much local, and this, of course, affects the question of a line of railway through Sind. The greater the through traffic and the smaller the local, the greater the advantage of the shortest line to the district supplying the through traffic.

Statement of river Native boat traffic at Sukkur.

22. Major Bonus, Deputy Consulting Engineer, in a report No. 4137, dated the 15th December 1864, gives the following figures of the river traffic by Native boats passing Mithunkote in 1863-64 :—

Statement of river Native boat traffic at Mithunkote in 1863-64.

Up	...	...	...	185,885
Down	...	...	...	1,179,177

23. It is unfortunate that the traffic at Sukkur was not recorded during the same year, and comparison with the Sukkur returns for any other year can be but of little use, as, during 1863-64 and the three subsequent years, the fluctuations in the traffic were extraordinary, partly from the down cotton trade, and partly from the failure of crops in the Punjab, which stimulated the up trade in grain.

Traffic at Sukkur not recorded in 1863-64.

24. As the only means of calculating the through trade with the Punjab and the trade due to Sind, the through trade given by Major Bonus for 1863-64 has been compared with the total exports and imports of the Sind ports during the same year. The following are the figures:—

Comparison of the Punjab trade with the whole import and export trade of Sind.

The traffic which passed Mithunkote (vide Major Bonus' report.)

Up	...	...	...	...	493,989
Down	...	...	...	...	1,483,393
					1,977,382 Maunds.
					73,000 Tons.

These figures include the merchandize carried by the steamers of the Indus Steam Flotilla, the Oriental Island Steam Navigation Company, and the Punjab Flotilla.

25. The total weight of the exports and imports during the same period, including small articles which are only given in numbers in the Customs Returns, but for which a small allowance has been made, was—

					Tons.
Imports	...	...	...	...	35,000
Exports	...	...	...	...	134,000
					169,000
Deducting the through traffic from the Punjab			...	...	73,000
That due to Sind is				...	96,000

River and railway traffic between Kotree and the sea ports during the past three years.

26. During the past three years the average up and down traffic are reported by Captain Dowden, Deputy Consulting Engineer, to be as follows:—

			Tons.
Up—By Sind Railway	...	...	36,565
By Native boats from Ketty	...	...	4,909
Total Up		...	41,474
Down—By Sind Railway	...	...	46,602
By Native boats to Ketty	...	...	29,683
Total Down		...	76,285
TOTAL		...	117,759

The details are given in Appendix D.

27. The trade, as given by Captain Dowden, is less than that of 1863-64, but there is no reason to doubt the general correctness of the figures in either case, as, since that year, which was a brisk one in trade, there has been considerable depression. This is very clearly shown by the comparative statement of imports and exports, (Appendix B).

Falling off in amount of traffic during the past three years explained.

The export of grain, pulse, and oilseed, which form the bulk of the Indus traffic, has, moreover, diminished in consequence of the failure of rain in the Punjab and the famine in Marwar. To the latter large quantities of grain have been conveyed from the Indus Valley.

28. With respect to the distribution of the Sind trade of 96,000 tons, there are no complete returns, but a fair approximation may be obtained by assigning a share to each portion of the province proportional to its revenue. The gross land revenue, including the territory of His Highness Meer Ali Moorad, is Rs. 48,37,295. Of this Rs. 19,02,534 is derived from the right bank, between Kotree and Sukkur, and

Distribution of the Sind trade.

Rs. 10,15,977 from the left bank, between Hydrabad and Rohree. The details will be seen from the map* attached, on which the revenue and population in each talooka are shown. Dividing the whole tonnage into shares proportional to the revenue the following result is obtained :—

* "Not reproduced."

		Revenue.	Tonnage.
The whole province	... Rs.	48,37,295	96,000
Right bank, between Kotree and Sukkur	... „	19,68,524	40,000
Left bank, between Hydrabad and Rohree	... „	10,15,977	20,000

Local traffic.

29. In addition to this there is a local traffic. The Committee has no means of ascertaining accurately what the amount of this may be, but, as each district produces more than it requires for its own consumption, and the whole country exports grain to a large extent, it is believed that the local traffic is small. It is of course in proportion to the population, and has been determined on the principles which will be found explained in paragraph 42 of this report.

Competition for the traffic between a railway and the river which affords fair means of transport for bulky goods; facts which show this, rate of freight, &c.

30. Before the traffic which would fall to a railway on either bank can be determined, however, it is necessary to consider how far the river navigation can compete for it. The Indus has often been condemned as a means of transit. For quick passenger traffic it is undoubtedly useless, but that it affords very fair means of transport for bulky goods is attested by the following facts :—

1st.—The Native boats convey merchandize at an average rate, up and down stream, of three farthings, or six pies per ton per mile. The distance by river commonly exceeds that by land by one-fourth : hence the rate on the distance by land is $7\frac{1}{2}$ pies.

2nd.—They are increasing in number every year. From a statement obtained from Mr. Howe, the Conservator of the Indus, the burthen of boats registered at Kotree during the year 1870 was 63,357 tons (*vide* Appendix E).

3rd.—From the number of trips which the boats can make up and down during a year, between the Punjab and the coast, and between intermediate places, and the fact of their often lying for a long time without freight along the whole course of the river, it is known that they have not full employment, and, therefore, that the rate of 6 pies per ton per mile, when they have work, must be a remunerative one. Crews are not constantly maintained for every boat: at the end of a voyage they are discharged and go to boats which have freight.

4th.—The steamers of the Indus Flotilla convey merchandize at the following rates :—

Up.

	Per ton per mile.
Grain	1·45 pence = 11·6 pies.
Cotton, pressed	2·17 ditto = 1 anna 5·4 pies.
Ditto, unpressed	3·00 ditto = 2 annas 0·6 pies.

Down.

	Per ton per mile.
Grain	1·09 pence = 8·7 pies.
Cotton, pressed	1·09 ditto = 8·7 pies.
Ditto, unpressed	1·81 ditto = 1 anna 2·5 pies.

The above rates per ton per mile are calculated on the distance by land, (450 miles), in order that they may be compared to the railway rates from place to place.

5th.—The up rates may be considered heavy, but the down rates are not so, and it is to be observed that the greater part of the trade is down.

6th.—Under the excellent management which has been introduced of late years, the Indus Steam Flotilla is working with profit. The rates of freight are, therefore, remunerative.

Share of the traffic which will fall to a railway.

31. These facts show that the Indus navigation will compete with a railway for the traffic. For such cargo as cotton and other valuable produce down, and for piece goods, &c., up, the railway will, as a rule, carry the whole of that which pertains to the district it may traverse, as well as that which belongs to the Punjab ; but, with respect to grain, oilseed and similar produce, the railway will possibly get only one-half of that produced in the district it traverses, and but a small fraction (possibly not more than one-twentieth) of that which arrives at Sukkur in Native boats from Punjab. Some of this merchandize will be cotton, but we question whether a cargo of cotton once shipped will be discharged above Kotree. The charge by Native boats is already lower than the railway rate for pressed cotton, and competition will lead to still lower rates by boats.

32. The merchandize now brought from the Punjab by the steam flotilla would no doubt come to the Railway. This, during 1863-64, was shown by Major Bonus to be 20,900 tons, and adding one-twentieth, or 2,540 tons, of that conveyed by Native boats, the whole through Punjab traffic which would come to the railway is 23,440 tons.

Improbable that produce will be carried across the river to the railway.

33. It is improbable that the produce of one side of the river will ever be carried across to the other, to be conveyed by the railway, except at Sukkur, where the permanency of the banks and the facility for ferrying render the crossing of goods easy and certain. At all other points, including Sehwan, where the bank is permanent only on one side of the river, it is probable that, if merchandize is once brought to the river and placed in a boat, it will be carried down to Kotree by water.

Passengers will cross the river to avail themselves of the railway.

34. Passengers, however, may be expected to cross the river at all points to avail themselves of the railway when they have any considerable distance to travel.

Objections to the Indus as a means of transit.

35. **The objections to the Indus as a means of transit are, that the navigation is slow and uncertain.** These disadvantages, however, do not affect the transport of grain and similar bulky articles, except under extraordinary circumstances. By the flotilla steamers the transit of merchandize is sufficiently quick, but it will be observed by comparison of the rates of freight how low that for grain by the steamers must be to compete with the native boats. It has only been by good management that the steamers have succeeded in carrying grain at all. It is commonly taken to fill up a vessel just before starting when more valuable cargo is not obtainable, and it is taken at extremely low rates,—lower than those shown. The Agent gives those under his orders a discretionary power to fill up vessels with grain at such rates as may be obtainable.

Complete system of railways.

36. We proceed to consider the question of a complete system of railways for Sind.

Will comprise both a right and left-bank line. Their costs.

37. It may be admitted that this will comprise both a right and a left-bank line connected by bridges at Rohree and Kotree. We estimate the total cost of such a system on a 3-feet 3-inch gauge, with rolling stock for four trains daily each way, at Rs. 2,38,51,318, or £2,385,132. This amount includes £90,000 for a bridge across the Indus between Sukkur and Rohree on the suspended girder principle, over which trains would have to travel slowly, and £383,250 for an iron-girder bridge over the Indus below Kotree, over which trains might be taken at the greatest speed required for traffic. We have estimated the cost of the bridge over the Indus at Kotree at £150 per foot run for a single line, having been led to adopt this rate from a consideration of the cost of the principal large railway bridges lately constructed in India.

Cost of railway bridges on large rivers in India.

38. The following is an abstract of the information furnished to us on this point:—

Railway.	Name of Bridge.	Total Cost of Bridge.	Cost per foot run.	Remarks.
		£	£	
East Indian ...	The Soane, with a single line of girders...	350,000	77	
Ditto ...	The Soane Bridge, after a second line of girders had been added	450,000	100	
Ditto ...	The Jumna Bridge at Allahabad, with girders for a single line only ...	400,000	130	
Ditto ...	The Jumna Bridge at Delhi ...	250,000	95	Founded on rock.
Bombay, Baroda, & Central India	The Nerbudda Bridge	...	100	This bridge still in need of strengthening.
Ditto ...	The Taptee Bridge	...	48	
Ditto ...	The Saburmuttee Bridge	...	35	

Cost of the Gorai Bridge on the Eastern Bengal.

39. Mr. Prestage, the Agent of the Eastern Bengal Railway, estimates that the Gorai Bridge will cost £200,000. The total length of this bridge is 1,726 feet, of which 1,295 are over the deep portion of the river, and 431 feet are over ground which is only inundated when the river is in flood. The cost may possibly be distributed as follows:—

	£
Over shallow portion of the River.	
421 feet, at £25 per foot run	10,525
Over deep portion of the River.	
1,295 feet, at £146·315 per foot run	1,89,475
TOTAL ...	200,000

The last bridge is the only one which crosses a river which can fairly be compared with the Indus below Kotree. Both rivers have sandy beds, and each has a large cold-weather discharge. The Nerbudda Bridge, which has cost £100 a foot run, is on a design which is too weak even for the Nerbudda, and would be altogether a failure if it were followed in the case of the Indus.

Probable cost of bridge at Rohree.

40. The cost of the bridge at Rohree has been estimated at £100 per foot run for the widest span of 600 feet, this being the rate at which the Niagara Railway Bridge, which has a clear span of 800 feet, was constructed. The freight from England and carriage in India will most likely prevent the narrower span of the Indian bridge being constructed at a cheaper rate than the American one. The shorter spans have been estimated at £50 per foot run.

The cost and probable return for each line.

41. The respective estimates for the left and right-bank lines amount to £1,232,857 for the former, and £1,152,274 for the latter (*vide* Appendices F and G).

Probable passenger and boat traffic.

42. In estimating the probable returns which each of these two lines would obtain, we have thought it advisable to consider separately the purely local traffic of Sind, the foreign traffic of Sind itself, and the foreign traffic of the Punjab which passes through Sind. With given fares the local passenger and goods traffic may be expected to pay in proportion to population and to the average rate of wages, it being assumed that, taking one part of India with another, the inducements to travel are about the same, while the means of travelling among the people, as well as the money cost of producing and transporting the articles consumed by them, vary nearly as the rate of the wages of the laboring classes. We find that the rate of wages in Sind is high as compared with other parts of India. We learn that it very rarely falls below 4 annas a day, and that, in the vicinity of towns, it is as high as 5 or 6 annas a day. We are, therefore, inclined to think that the average daily passenger mileage in Sind per thousand inhabitants will exceed the average daily passenger mileage per thousand inhabitants in other parts of India. From the few facts entered in Appendix H, it will be seen that in 1847, this average amounted to 106 in the United Kingdom, and 52·4 in Belgium. At a period when only 96 miles of the Madras Railway were open to traffic, this average was only 18·7 with a 4 pies per mile fare, but it amounted to 63·08 with a 2 pies per mile rate. We believe that, with a 3 pies per mile rate the average daily passenger mileage may, at a moderate estimate, be put down at 50 per thousand inhabitants. The receipts from purely local goods traffic we have set down at half that from passenger traffic. Statistics which would decidedly settle this item do not, we believe, exist, but we are under the impression that our estimate is not far out. The result arrived at may, however, for convenience of reference, be stated in the following form:—

Annual average distance travelled by an individual along the railway	18·25 miles.
Average annual sum paid by an individual for a railway ticket ...	4·56 annas.
Average sum paid for goods traffic per individual per annum ...	2·28 „

which is about the charge for conveying one-third of a ton, or one man's annual consumption of food, eight miles.

Foreign traffic of Sind.

43. The distribution of the foreign traffic of Sind has been made in paragraph 28 of this report. It is there computed that 48,000 tons leave the right-bank district, being carried an average distance of 170 miles to Kotree from Larkhana, which is computed to be the trade centre of the right bank, and that one-half of this will be sent by rail, giving the right bank an annual ton mileage of 3,400,000, which is, in round numbers, equivalent to a through traffic of 15,300 tons along 222½ miles. A similar calculation makes the foreign traffic of the left bank to be 20,000 tons, carried an average distance of 109 miles from a centre of trade situated near the town of Mora, and yielding to the railway an annual ton mileage of 1,090,000.

Foreign traffic of the Punjab—

1. Carried by the Indus Flotilla	20,900 Tons.	
2. One-twentieth of that brought down in Native boats ...	2,540 „	
TOTAL ...	23,440 Tons.	

44. The foreign traffic of the Punjab passing through Sind is computed at 23,440 tons as per margin. This will necessarily pass over whichever line of railway may be first constructed.

Probable return on the outlay of capital.

45. From computations made on the above data for passenger and goods traffic and recorded in Appendix I, it will be seen that, if the working charges of the line amount to only 50 per cent. of the gross receipts, the right-bank line will yield 3·02 per cent., and the left-bank line 2·22 per cent.; but that, if the working charges amount to 60 per cent., these percentages will be reduced to 2·41 and 1·78. If the whole charge for the through goods from the Punjab be made as great on the shorter left-bank line (or at the rate of 10 pies per ton per mile

hitherto assumed to be common to the two lines as it would be on the longer right-bank line, the percentage of profit on the left bank will be raised from 1·78 to 2·118.

The section to be first undertaken.

46. It has been seen that the profits likely to be yielded by either the left-bank line alone or the right-bank line alone are small, even if only one line is in existence. Were they both constructed and working at the same time, either the whole of the through traffic from the Punjab would pass along the shortest line, or would be distributed between the two lines. In either case the whole net receipts would fall short of the following sum :—

	Rs.
1.—Net receipts for the right-bank line, as per Appendix ...	3,48,426
2.—Purely local traffic of the left-bank line as per do. ...	1,28,237
3.—Foreign trade of the left-bank districts :—	
Net receipts, at 5 pies per ton per mile, on 5,800 tons carried through the line	28,500
TOTAL ...	5,05,163

or £50,401 net receipts from a capital expenditure of £2,385,132. This return is at the rate of 2·12 per cent., and is based on the assumption that the working charges amount to only 50 per cent. of the gross receipts. If these amount to 60 per cent. of the gross receipts, the net return will only reach 1·7 per cent. of the capital expended.

Proposed irrigation and navigation canal from Rohree.

47. In the event of the proposed irrigation and navigation canal from Rohree to Hydrabad being constructed in addition to a line of railway, the latter might be laid down either on the right or the left bank of the Indus. If it were laid down on the left bank, it would be a competing line with the canal. Moreover, by this arrangement, the whole of the purely local traffic of the right-bank districts, as well as that caused by their foreign trade, would be lost. This loss may be estimated as follows, the figures being taken from Appendix I. :—

	Rs.
Right bank of the Indus.	
Net local traffic receipts	1,23,956
Through traffic.	
Net receipts from 15,300 tons, through 222½ miles, at 5 pies per ton per mile	88,400
TOTAL ...	2,12,356

But, if the working charges amounted to 60 per cent. of the gross receipts, this amount would be reduced to four-fifths of Rs. 2,12,356, or Rs. 1,69,885.

Saving that ought to be effected by making railway and canal on the same side of the river.

48. This loss would be compensated if a saving of the capital of which this sum represents the interest would be made by constructing a line along the canal bank to the east of the Indus, instead of constructing the right-bank line. This capital amounts to Rs. 33,97,700, or £339,770.

49. The estimates for the right and the left-bank lines, made without any reference to the canal, are as follows :—

	£
Left-bank line	1,232,857
Right-bank line	1,152,275
Amount to be saved	80,582
In addition to the above	339,770
TOTAL ...	420,352

This represents the total sum which should be saved by carrying the railway along the canal bank, if it were realy sound economy to make this arrangement. That this is not the case will be seen from the following liberal estimate of the saving which might be effected by carrying the railway along the canal bank :—

	Rs.
1.—Earthwork, the whole amount of the estimate ...	1,27,500
2.—Fencing, with carriage of rails, an average of 50 miles, at 3½ annas per ton per mile, for 14,245 tons ...	1,55,800
3.—Bridges, one-half	2,03,500
4.—Carriage of sleepers for 20 miles	23,500
TOTAL ...	5,10,300
OR £	51,030

Inadvisability of constructing both the canal and railway on the left bank. The canal the more suitable work for that side of the river.

50. This is, in fact, but one example of a truth which may easily be demonstrated in a more general manner, *viz.*, that the bringing together of two means of communication of unequal power greatly diminishes the utility of the weaker one, and renders the construction of both together undesirable. Applying this remark to the present subject, it may be said that it would be a waste of money to make a canal and a railway side by side from Rohree to Hydrabad. Moreover, the agricultural state of the province is such that a canal appears to be the more suitable work of the two on this line.

Effect of improvement in the condition of the country on the left bank in increasing railway net receipts very small.

Thinness of population must cause the dividend to be small for a long time to come.

Necessity for improved irrigation.

51. As the population on the left bank of the Indus is at present a poorer one than that on the right bank, its foreign trade has been estimated at only 20,000 tons per annum, whereas the foreign trade from the nearly equal population of the districts on the right bank has been set down at 40,000 tons per annum. In each case a railway would, it is supposed, convey one-half of the foreign trade. As it may be interesting to know what effect would be produced on the profits of the railway if the present population on the left bank became, in consequence of improved irrigation, as rich as those on the right bank now are, we have made the computation required to answer this question. We find that it would raise the percentage of profit for the left-bank line from 1·78 to 1·95, when the working charges are 60 per cent. of the gross receipts. This increase is small, and shows clearly that a considerable increase must take place in the population of Sind before a railway through it earns a fair dividend on the capital expended. A railway will, however, greatly facilitate any immigration, which may be caused by an improvement in the irrigation of the country, or rather by the substitution of a really good system of irrigation canals for the present inundation channels, which only deliver the water on the surface of a very limited area of country, though they also facilitate irrigation by carrying the water below the surface of the land across large tracts.

Alternative plan of crossing the Indus by a bridge at Sehwan inadvisable.

52. In Appendix K will be found an estimate of the cost of constructing two lines of railway. The first is the direct line between Kotree and Sehwan, 81 miles in length, which is estimated to cost £372,507 ; the second is for a branch joining the right-bank main line at Sehwan with the left-bank main line at about 75 miles from Kotree. The estimate for this branch amounts to £635,448. These figures will suffice to prove the inadvisability of substituting the branch connecting the right and left-bank lines for the line from Sehwan to Kotree. The great cost of the branch is mainly due to the large expenditure required for a bridge across the Indus at Sehwan, where the channel of the river varies from year to year, and would, therefore, have to be rectified and fixed at a probable cost of 10 lakhs of rupees.

53. At some future day it will doubtless be considered advisable to connect Ahmedabad on the Bombay, Baroda, and Central India line of Railway with Hydrabad in Sind; but, as this work is not likely to be taken in hand for a good many years, we have not deemed it proper to charge to that line any part of the cost of the bridge across the Indus below Kotree. We have taken for granted that the interest on the capital cost thereof should be debited to the left-bank main line from Kotree throegh Hydrabad to Rohree.

Connection between the Indus Valley Railway and the Bombay and Baroda line at Ahmedabad not likely to be made for many years.

54. No surveys have yet been made with the view to ascertaining the probable cost of constructing branch feeding lines of railway in Sind, but some allowance must be made to one important branch, which may ere long be necessary, that is, a branch from the right-bank main line, where it approaches the important town of Shikarpoor, through that town to Jacobabad, and on towards the Bolan Pass. The value of this branch in a military point of view is well known; commercially, also, it must be considered to be nearly, if not quite, as important as the main line itself.

Branch lines.
Importance of a branch through Shikarpoor and Jacobabad towards the foot of the Bolan Pass.

(Signed) J. G. FIFE, *Colonel, R. E.*, ***President.***
„ P. O'CONNELL, *Lieut.-Col., R. E.*, } ***Members.***
„ M. HAIG, *Major*,

KURRACHEE,
9th April 1871.

APPENDIX A.

Statement showing the gross Land and Sayer Revenue of Sind, from 1853-54 to 1869-70.

	1853-54.	1854-55.	1855-56.	1856-57.	1857-58.	1858-59.	1859-60.	1860-61.	1861-62.	1862-63.	1863-64.	1864-65.	1865-66.	1866-67.	1867-68.	1868-69.	1869-70.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Gross Land Revenue ...	Average 31,11,915 28,30,282	35,13,351	30,88,112	31,30,917	37,35,173	34,41,411	34,51,971	35,39,398	40,68,851	41,01,744	41,80,786	43,16,172	36,93,314	42,11,071	Average 43,84,747. 41,05,319	44,11,630	46,37,292	39 per cent.
Sayer ditto ...	...	...	...	...	...	...	9,62,186	...	15,92,749	16,51,117	18,86,790	19,24,652	16,43,145	18,33,802	19,16,668	19,77,528	20,32,907	
TOTAL ...	...	...	...	...	...	...	44,14,157	...	56,61,600	60,52,861	63,76,576	62,40,824	53,36,459	60,44,873	60,21,987	63,89,158	66,70,199	

NOTE.—*In some of the above columns the Sayer Revenue has not been entered, as the figures were not ready when the Committee closed its proceedings.*

APPENDIX

Comparative Statement of the value of the Principal Articles

ARTICLES.	1847-48.	1848-49.	1849-50.	1850-51.	1851-52.	1852-53.	1853-54.	1854-55.	1855-56.	1856-57.	1857-58.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Agricultural Implements ...	...	...	...	...	...	...	...	...	...	...	...
Animals, living	...	...	...	...	...	...	...	...	...	...	...
Apparel	33,245	68,531	34,853	61,184	97,597	1,35,333	86,039	1,35,614	1,52,204	1,01,763	1,53,857
Arms and Ammunition	47,719	17,457	17,830	10,757	23,016	20,036	46,504	48,499	57,688	26,735	49,856
Art, works of	...	...	...	...	...	...	...	...	...	...	...
Books	4,201	9,566	9,034	12,838	18,986	19,827	26,775	41,161	80,134	35,720	32,317
Bottles	...	...	...	...	...	...	...	...	...	...	...
Brimstone	...	...	...	...	...	...	...	...	...	...	...
Cabinetware	...	...	...	...	...	...	...	...	...	...	...
Candles of all kinds	...	...	...	...	...	...	...	...	...	...	...
Canes	...	...	...	...	...	...	...	...	...	...	...
Canvas	...	...	...	...	...	...	...	...	...	...	...
Carriages and Conveyances, other than Railway	...	...	...	...	...	...	...	...	...	...	...
Clocks and Watches	...	...	...	...	...	...	...	...	...	...	...
Cocoanuts	46,425	84,688	89,135	82,249	1,03,275	94,311	94,125	49,785	80,220	1,13,458	63,801
Coffee	6,409	6,514	2,139	5,001	5,066	10,606	27,507	26,637	13,398	30,430	70,535
Coir, and manufactures of ...	...	...	...	...	...	...	...	...	...	...	...
Confectionery	...	...	...	...	...	...	...	...	...	...	...
Corks	...	...	...	...	...	...	...	...	...	...	...
Cotton Wool	1,13,453	49,247	72,300	52,217	94,883	46,567	44,294	38,524	28,870	17,414	45,643
Cotton Piece Goods	8,45,616	9,68,238	15,71,662	14,68,155	17,72,616	20,42,325	20,41,692	22,20,802	27,47,266	26,79,733	45,92,092
Cotton Twist, and Thread ...	40,722	1,23,309	1,41,251	1,24,883	1,89,481	1,40,087	1,79,642	2,32,536	2,03,227	1,91,481	1,97,609
Drugs and Medicines	14,468	13,836	29,291	39,517	49,624	55,411	92,278	79,128	62,624	54,880	52,225
Dyes	14,236	31,730	25,256	59,064	48,490	44,567	43,096	55,494	67,334	70,663	72,328
Earthen and Porcelainware ...	4,947	5,542	11,170	17,027	21,285	14,787	23,575	30,964	24,543	21,031	20,678
Fireworks	...	...	...	...	...	...	...	...	...	...	...
Fruit and Vegetables	1,49,466	1,53,071	1,58,085	1,31,966	1,09,012	1,29,445	1,15,968	1,21,544	1,21,934	2,01,630	1,37,567
Fuel—Coal and Coke	...	...	...	...	...	3,175	10,120	9,242	3,000	4,800	...
Glass, and manufactures of ...	11,914	14,462	12,483	20,697	29,138	29,809	28,253	41,217	31,888	21,012	29,661
Grain and Pulse	3,04,367	4,34,180	1,94,914	95,830	2,02,591	2,06,666	1,24,566	1,52,655	2,32,027	4,32,969	1,86,269
Gum	...	...	...	...	...	...	...	...	...	...	...
Hemp, and manufactures of ...	...	...	...	...	...	...	...	...	...	...	...
Instruments and Apparatus, scientific and philosophical	...	...	...	...	...	...	...	...	...	...	...
Ivory	11,233	2,561	12,811	11,745	17,864	24,019	22,551	34,002	27,096	2,931	38,75
Jewellery	3,290	5,672	3,706	21,420	23,768	7,552	4,260	11,453	13,317	8,783	5,25
Jute, manufactures of ...	268	1,979	1,287	1,209	2,643	11,734	1,393	9,923	728	24,354	39,33
Leather, manufactures of ...	2,042	10,697	11,010	16,439	16,941	15,830	17,420	44,795	29,633	21,812	15,17
Liquors—Ale, Beer, and Porter ...	77,225	97,455	1,05,954	1,39,956	1,55,219	1,70,718	1,84,074	1,82,120	1,20,431	76,095	1,23,060
Wines and Liqueurs ...	41,936	1,24,612	1,17,290	1,12,090	1,18,964	1,04,713	93,186	1,16,601	97,177	1,11,470	1,66,45
Spirits ...	51,134	89,042	1,01,128	1,06,144	1,10,530	75,065	79,296	1,12,453	97,413	1,51,784	1,89,60
Lucifer Matches	...	682	799	1,393	1,559	...	...	1,634	1,723	...	...
Machinery	7,351	...	1,450	3,200	6,527	6,452	3,480	613	3,293	2,410	7,70
Metals, and manufactures of ...	57,219	93,332	2,09,715	2,50,879	2,46,582	2,50,005	3,08,343	3,09,506	3,23,406	4,18,127	5,65,67
Military Regulation Uniforms and Accoutrements	...	...	...	...	...	...	...	...	...	...	...
Musical Instruments	...	...	...	...	...	...	...	...	...	...	...
Oils	14,103	12,104	5,277	4,759	2,244	4,018	4,706	6,215	9,661	9,350	2,921
Paints and Colors	1,189	1,240	678	5,960	3,935	2,151	7,719	20,482	8,610	6,486	14,391
Paper	...	...	...	...	...	...	...	...	...	...	...
Perfumery	...	...	...	...	...	...	...	...	...	...	...
Printing and Lithographing ...	...	...	...	...	...	...	...	...	...	...	...
Provisions and Oilman's Stores ...	26,881	50,717	87,774	92,399	63,670	70,329	69,858	1,19,922	89,522	1,09,176	1,94,262
Railway Materials ...	...	...	...	...	...	...	...	...	...	5,63,402	6,18,295
Seeds	31,630	37,800	13,322	17,516	21,852	26,657	32,749	2,570	34,322	22,859	26,383
Shells	3,664	4,426	6,826	8,175	6,130	12,815	12,782	3,632	4,995	3,922	1,649
Ships	...	...	...	...	...	...	...	...	...	...	...
Silk, raw	67,107	1,01,835	94,531	1,50,500	1,17,063	1,34,689	1,61,853	1,62,984	1,47,794	56,577	1,62,184
Silk, manufactures of	76,448	59,524	73,915	92,142	98,342	99,503	41,157	59,479	79,381	49,427	77,353
Soap ...	...	...	...	...	...	...	...	...	...	...	...
Spices	83,551	95,821	1,68,549	1,39,428	2,05,659	2,25,672	1,45,800	3,25,459	1,76,393	2,75,440	1,61,901
Stationery	13,136	23,293	25,635	34,796	32,770	31,148	42 615	52 300	53,488	48,810	82,619
Sugar and other saccharine matter ...	4,62,676	2,89,110	2,79,785	4,77,177	3,95,495	5,23,020	2,56,230	3,27,433	2,29,669	1,72,014	1,72,547
Tea	37,739	39,723	22,796	27,108	51,200	44,438	38,890	47,653	64,716	57,384	75,308
Timber and Wood	12,421	12,413	22,256	36,554	40,980	55,563	43,787	43,959	50,736	37,543	75,308
Tobacco	31,980	51,909	51,533	34,600	51,582	51,521	64,894	90,380	60,946	54,100	1,10,874
Toys and Games	...	...	...	...	...	...	...	...	...	...	...
Treasure	2,150	...	10,691	12,870	14,097	35,046	30,165	61,193	3,00,378	2,09,488	16,63,103
Umbrellas	...	...	...	...	...	...	...	...	...	...	...
Wool ...	...	210	347	2,675	950	1,349	1,682	10,430	19,922	8,860	19,835
Wool, manufactures of	24,723	47,002	42,710	46,533	48,172	56,852	57,596	42,239	57,358	36,210	1,34,851
All other articles	1,00,436	2,13,627	3,52,350	2,29,264	2,72,404	3,23,077	3,77,024	2,45,706	2,88,809	3,19,064	3,41,787
TOTAL ...	28,78,720	34,47,157	41,93,528	42,58,316	48,92,202	53,56,908	50,87,934	57,51,967	62,98,134	68,56,657	1,08,11,012

B.

of Import into the Province of Sind for the last 23 years.

1858-59.	1859-60.	1860-61.	1861-62.	1862-63.	1863-64.	1864-65.	1865-66.	1866-67.	1867-68.	1868-69.	1869-70.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
...	...	...	...	...	...	...	...	...	...	1,489	A
...	...	...	...	...	...	...	...	...	...	...	8,210
2,78,227	3,41,737	3,25,581	1,74,146	2,05,181	4,99,438	3,46,891	2,29,561	2,49,794	2,52,488	3,43,970	2,71,626
48,060	86,554	83,581	1,12,571	57,769	33,017	20,865	28,049	33,298	32,831	37,277	42,844
...	...	...	...	...	...	...	...	...	...	9,062	1,603
74,803	66,305	62,669	48,712	46,360	67,890	70,458	61,497	41,248	48,367	57,890	52,058
...	...	...	...	...	...	...	...	...	...	10,673	9,391
...	...	...	...	...	...	...	...	...	...	3,214	1,620
...	...	...	...	...	...	...	...	...	...	23,083	9,033
...	...	...	...	...	...	...	...	...	...	16,521	28,326
...	...	...	...	...	...	...	...	...	...	12,288	13,037
...	...	...	...	...	...	...	...	...	...	24,664	20,825
...	...	...	...	...	...	...	...	...	...	20,279	...
...	...	...	...	...	...	...	...	...	...	5,827	21,820
1,00,014	88,646	1,44,338	1,01,146	2,77,660	1,47,816	2,22,758	1,28,685	1,46,391	3,46,482	3,49,174	12,785
34,223	4,157	16,621	52,473	74,479	49,079	50,346	28,338	50,593	33,242	25,235	3,45,636
...	...	...	...	...	...	...	...	...	...	22,195	37,792
...	...	...	...	...	...	...	...	...	...	8,626	21,878
...	...	...	...	...	...	...	...	...	...	11,125	14,586
...	...	...	...	...	...	...	...	...	...	47,499	12,592
32,814	65,680	1,12,296	16,518	30,099	1,145	2,178	1,530	500	5,792	94,28,922	4,812
66,11,394	66,58,143	61,02,753	65,65,762	62,73,878	61,43,403	70,59,329	85,81,502	82,68,996	90,59,996	3,49,102	85,15,329
3,59,831	3,84,764	2,72,169	2,30,164	3,29,465	2,95,145	4,87,310	4,85,119	4,72,986	6,04,924	1,24,472	4,92,597
92,465	69,558	1,01,170	52,349	95,231	96,136	1,08,149	1,33,039	1,21,451	1,33,125	1,55,085	1,37,058
1,28,224	1,34,911	2,05,638	1,63,530	1,42,995	2,17,689	1,69,739	1,84,629	2,36,167	1,61,454	33,942	1,52,771
47,913	56,837	49,087	50,276	49,663	57,558	54,652	26,253	44,641	48,439	5,636	38,705
...	...	...	...	...	...	...	...	...	...	2,97,432	8,522
1,92,914	1,67,873	1,57,337	2,75,254	3,75,361	2,72,923	3,74,330	4,10,411	2,82,372	5,10,288	3,51,288	5,53,846
1,499	18,760	76,262	2,08,130	1,87,971	3,02,181	1,58,647	5,33,686	3,91,113	4,27,828	71,937	43,959
55,532	64,154	84,510	67,192	62,678	66,091	67,849	52,191	50,488	56,578	1,77,222	45,192
1,16,646	1,11,810	65,821	98,964	84,657	3,40,927	8,58,121	2,08,132	89,266	1,02,827	2,396	10,84,340
...	...	...	...	...	...	...	...	...	...	59,647	4,144
...	...	...	...	...	...	...	...	...	...	...	30,575
...	...	...	...	...	...	...	...	...	...	2,003	...
65,436	1,21,395	33,808	40,381	78,618	87,287	58,287	54,857	50,844	97,511	1,13,147	4,209
37,423	15,428	10,900	32,964	33,504	36,022	46,321	18,941	25,123	19,771	37,363	49,877
72,572	86,384	1,31,246	1,69,509	4,22,574	3,58,032	5,23,040	4,31,420	4,56,012	2,15,621	2,09,133	19,997
43,180	32,598	33,329	14,457	27,103	30,682	34,089	36,450	45,787	57,070	43,109	2,38,872
2,37,143	1,31,208	2,21,730	2,27,204	2,32,500	3,28,904	1,84,891	2,54,226	2,77,730	2,05,290	2,26,714	59,628
3,04,068	2,74,989	2,53,236	1,68,602	2,10,413	1,99,991	1,82,386	2,71,633	2,21,833	2,56,174	4,07,598	1,83,456
2,94,063	3,06,404	2,04,195	1,93,798	3,13,104	2,47,214	2,28,221	2,97,780	2,84,346	4,03,482	5,60,412	3,37,307
...	6,442	14,608	16,786	18,407	27,729	47,420	10,593	...	40,338	14,236	5,42,517
2,47,701	3,57,849	9,39,615	16,412	2,72,567	42,158	3,21,604	99,125	3,22,894	3,48,349	3,02,811	17,863
8,81,604	10,83,669	12,18,763	15,46,851	17,97,998	14,16,658	21,92,943	13,62,605	14,36,048	27,46,895	25,97,634	5,48,727
...	...	...	...	...	...	...	...	...	...	71,167	20,24,809
...	...	...	...	...	...	...	...	...	...	8,574	7,591
...	...	...	...	...	...	...	...	...	...	32,208	14,162
11,736	15,831	13,792	13,137	15,468	10,994	23,598	10,461	62,067	52,298	70,961	27,361
18,545	31,686	31,457	24,802	35,876	39,627	27,350	25,350	53,715	57,535	47,871	86,122
...	...	...	...	...	...	...	...	...	...	6,903	69,301
...	...	...	...	...	...	...	...	...	...	18,611	9,359
...	...	...	...	...	...	...	...	...	...	2,44,640	10,958
2,08,217	2,22,962	2,11,212	2,10,416	2,10,318	2,41,023	2,30,675	1,66,899	2,10,837	2,21,173	7,26,499	2,39,654
11,69,347	21,09,789	18,16,324	22,31,252	9,06,908	18,74,595	7,21,843	12,62,828	29,91,625	14,98,674	45,790	1,11,219
1,08,752	4,991	48,089	30,235	31,202	7,546	74,727	33,454	16,800	74,115	7,513	37,395
7,792	62,006	35,948	21,890	20,531	83,170	4,043	24,413	15,557	12,558	...	18,124
...	...	...	...	...	...	...	...	5,64,761	2,89,669	6,95,130	...
4,71,038	4,46,179	3,49,379	1,30,419	5,54,889	4,20,374	4,44,460	5,84,469	9,01,549	5,27,516	75,510	7,33,278
1,05,116	92,484	85,048	82,561	1,02,639	1,21,659	1,59,818	1,23,668	1,24,198	69,319	9,373	40,752
...	...	...	...	...	...	...	...	...	...	4,28,338	5,573
4,28,731	2,93,176	2,88,289	4,89,409	3,44,716	3,05,882	6,15,292	2,90,672	3,57,529	4,86,933	44,477	5,24,651
1,01,457	1,12,988	98,475	1,03,737	1,41,810	1,21,803	1,54,032	89,761	44,280	57,580	11,50,536	37,574
1,65,434	2,73,860	2,88,775	3,06,013	5,80,397	6,88,940	6,09,666	5,50,327	6,43,433	8,43,632	5,41,362	10,35,610
1,62,007	1,41,368	1,05,182	70,408	2,63,875	3,98,431	4,89,172	5,92,971	4,65,012	8,08,987	2,69,214	8,20,609
2,27,068	3,86,544	3,00,770	1,88,412	3,51,706	2,30,337	4,05,041	89,271	1,14,070	1,26,995	82,827	2,94,130
1,42,723	1,40,920	1,60,270	60,917	48,396	1,10,205	78,012	76,929	75,597	1,00,859	19,913	66,837
...	...	...	...	...	...	...	...	...	...	6,71,338	18,289
10,19,184	11,82,259	8,83,529	4,39,156	63,76,236	77,52,092	43,39,732	15,17,271	64,03,550	25,93,080	1,80,397	4,71,136
...	...	...	...	...	...	77,079	1,50,802	78,847	1,30,845	2,42,635	1,38,710
9,454	15,845	42,550	75,066	1,02,260	1,29,073	1,61,915	1,37,199	1,63,096	1,95,377	7,170	1,96,671
1,46,616	65,367	93,885	1,04,543	94,411	1,72,224	...	...	...	...	1,49,589	9,714
5,35,092	7,62,977	7,92,811	7,09,578	5,46,011	6,44,282	6,59,418	5,37,879	4,81,502	6,78,878	...	1,22,297
1,54,06,058	1,71,27,517	1,65,66,581	1,59,36,702	2,24,28,184	2,47,47,372	2,31,67,000	2,01,95,509	2,73,66,886	2,50,41,185	2,24,59,749	2,11,97,209

APPENDIX

Comparative Statement of the value of the Principal Articles

ARTICLES.	1847-48.	1848-49.	1849-50.	1850-51.	1851-52.	1852-53.	1853-54.	1854-55.	1855-56.	1856-57.	1857-58.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Animals, living ...	2,05,800	1,83,400	31,300	82,000	1,01,600	2,59,944	3,40,079	3,51,514	3,49,034	4,39,880	50,386
Apparel ...	...	...	...	...	...	...	...	...	...	...	...
Borax ...	...	...	...	...	...	...	...	...	...	...	...
Cotton Wool ...	...	2,060	...	3,285	3,909	37,355	6,100	1,859	15,346	9,708	39,992
Cotton Goods ...	1,086	7,219	9,988	13,515	35,103	35,421	20,362	20,599	41,289	41,904	12,129
Cotton Twist ...	...	...	...	...	...	...	...	...	...	...	...
Drugs and Medicines ...	78,101	63,515	61,223	1,56,857	85,501	91,972	95,339	1,26,578	1,42,160	1,00,504	1,60,159
Dyes ...	28,252	30,509	1,23,645	2,63,675	2,73,659	4,27,145	4,37,281	3,57,173	5,01,349	8,25,452	6,18,961
Fruit and Vegetables ...	2,858	28,906	28,841	33,657	35,250	37,618	30,381	25,807	29,005	37,369	47,561
Fuel—Firewood ...	...	...	...	...	...	...	...	...	...	...	...
Grain and Pulse ...	48,431	56,070	3,54,895	5,97,257	6,97,756	4,55,999	2,70,205	6,80,971	5,63,492	1,58,109	4,00,373
Hemp, and manufactures of ...	...	...	...	...	...	...	...	...	...	...	...
Hides and Skins ...	39,659	45,874	30,309	29,068	15,272	12,712	13,887	41,563	30,272	38,572	35,131
Jute, and manufactures of ...	...	...	...	...	...	...	...	...	...	...	...
LIQUORS—											
Ale, Beer, and Porter ...	...	...	...	...	...	...	...	...	...	...	...
Wines and Liqueurs ...	...	...	...	...	...	...	...	...	...	...	...
Spirits ...	...	...	...	...	...	...	...	...	...	...	...
Metals ...	...	...	...	...	...	...	...	...	...	...	...
Oils ...	1,350	1,639	7,471	25,082	23,802	10,615	11,861	9,199	28,606	18,103	32,831
Provisions and Oilman's Stores ...	44,737	30,993	42,251	56,597	1,25,917	2,25,167	1,40,750	1,33,730	2,87,856	2,09,957	2,71,575
Salt ...	...	156	...	...	...	...	...	41,587	...	13,074	28,000
Saltpetre ...	79	...	1,287	31,310	1,337	1,03,530	1,92,565	2,08,616	2,12,001	3,75,472	5,96,027
Seeds (oil) ...	25,383	9,743	12,754	52,171	1,59,129	2,30,984	1,45,626	1,31,171	13,99,763	12,47,827	31,05,342
Silk, raw ...	537	1,349	981	1,225	5,196	2,002	6,195	4,595	3,761	3,20,174	2,73,042
Silk, manufactures of ...	7,175	12,151	13,621	7,197	12,110	13,575	22,014	11,259	12,246	13,531	14,088
Spices ...	...	...	...	...	...	...	...	...	...	...	...
Sugar and Molasses ...	325	4,421	1,362	926	2,526	722	5,306	6,534	1,732	12,415	3,350
Tea ...	...	728	357	128	150	...	495	...	1,961	2,485	2,100
Tobacco ...	4,050	753	501	276	877	3,168	1,065	374	939	3,796	247
Wood ...	...	590	1,992	5,008	218	365	148	450	408	4,214	3,498
Wool ...	1,81,598	1,32,709	2,21,719	5,19,218	7,57,362	15,38,142	18,02,628	12,18,225	22,13,108	31,15,903	39,37,471
Wool, manufactures of ...	5,452	1,192	7,907	14,534	5,352	16,581	19,103	19,682	8,216	73,866	5,74,225
Treasure ...	7,73,719	4,07,276	1,20,584	4,919	8,810	9,525	4,114	8,749	32,771	98,816	45,182
All other articles ...	98,713	49,996	65,662	66,663	48,563	1,67,362	2,09,962	26,637	1,69,097	1,84,091	2,39,646
TOTAL ...	15,47,308	10,71,339	11,43,783	19,64,618	24,41,228	37,63,376	37,63,107	34,68,936	60,44,403	73,45,222	1,07,81,286

APPENDIX

Statement of Boat Tonnage, River Traffic on the

	UP TRAFFIC.								
	BOATS LADEN WITH MERCHANDIZE: THROUGH TRAFFIC.			BOATS DISCHARGING THEIR MERCHANDIZE AT SUKKUR.			BOATS LEAVING THE BUNDER WITH MERCHANDIZE.		
	Number of boats.	Burthen in Maunds.	Quantity of merchandize in Maunds.	Number of boats.	Burthen in Maunds.	Quantity of merchandize in Maunds.	Number of boats.	Burthen in Maunds.	Quantity of merchandize in Maunds.
For 1856 ...	740	368,550	330,800	600	217,000	166,500	629	223,400	167,500
„ 1857 ...	619	309,200	234,400	851	339,800	242,000	899	367,250	249,300
„ 1858 ...	87	106,340	57,670	571	250,062	76,957	630	281,955	59,762
„ 1859 ...	345	184,715	20,816	1,138	491,216	159,935	1,639	531,300	156,739
„ 1860 ...	104	64,598	48,449	1,916	982,175	821,357	1,733	689,660	523,958
„ 1861 ...	85	54,710	49,080	1,716	741,210	583,870	1,699	663,511	589,133
„ 1862 ...	...	...	...	1,292	566,193	151,935	1,714	456,870	391,877
„ 1865 to 1866 ...	74	58,901	26,293	331	85,350	25,586	3,108	1,540,135	521,233
„ 1866 to 1867 ...	43	28,969	98,664	82	31,122	8,244	4,846	669,628	1,229,149
„ 1867 to 1868 ...	932	550,818	122,051	293	111,797	42,915	167	2,698,148	1,562,719

B —*continued.*

of Export from the Province of Sind for the last 23 *years.*

1858-59.	1859-60.	1860-61.	1861-62.	1862-63.	1863-64.	1864-65.	1865-66.	1866-67.	1867-68.	1868-69.	1869-70.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
9,57,215	9,36,275	4,30,000	2,90,000	1,20,924	3,53,118	4,41,323	4,61,542	2,22,160	4,23,495	6,41,609	5,97,336
...	...	...	...	...	...	...	...	...	...	46,776	58,474
...	...	...	...	...	...	...	...	...	...	34,037	15,258
4,100	590	85,690	11,91,964	1,43,93,484	2,11,60,043	1,06,31,206	96,53,403	58,01,473	40,18,564	47,16,407	75,19,180
29,043	43,960	1,18,256	84,473	3,56,145	4,95,718	3,48,701	3,71,228	2,98,845	2,98,130	2,18,915	1,75,951
...	...	...	...	...	...	...	...	...	...	55,686	33,900
2,63,785	3,14,075	1,52,947	1,55,375	1,48,862	1,05,523	1,67,904	2,72,457	2,11,206	1,69,944	3,07,929	1,80,710
4,25,937	6,79,397	5,39,424	11,74,636	12,15,514	5,94,041	13,72,543	14,17,002	11,76,653	12,61,550	16,71,537	27,90,253
1,02,837	1,44,715	91,020	1,24,521	1,71,479	1,72,709	1,62,026	2,45,695	1,61,172	2,55,960	1,88,867	2,41,387
...	...	...	...	...	...	...	...	...	...	34,579	53,557
3,41,492	7,49,079	14,49,966	9,84,339	20,11,510	49,35,833	42,74,862	32,84,735	44,10,000	39,88,560	21,48,092	12,90,921
...	...	...	...	...	...	...	...	...	...	15,590	17,706
46,979	81,986	85,578	1,37,930	49,031	37,469	37,210	56,762	69,792	50,706	1,38,005	3,76,682
...	...	...	...	...	...	...	...	...	...	2,974	19,667
...	...	...	...	...	...	...	...	...	...	2,610	2,555
...	...	...	...	...	...	...	...	...	...	3,575	4,757
...	...	...	...	...	...	...	...	...	...	10,549	8,313
...	...	...	...	...	...	...	...	...	...	22,141	12,445
29,959	33,083	42,571	55,720	1,36,779	1,03,115	79,657	1,04,143	5,23,511	6,77,960	2,40,678	1,84,383
1,50,291	1,89,221	1,28,720	1,91,019	5,46,507	15,71,213	20,67,070	19,68,436	10,51,795	12,34,095	13,67,470	9,71,547
2,09,561	26,310	2,04,023	5,88,575	54,047	65,287	1,516	...	...	...	22,200	68,400
9,45,965	7,48,121	5,86,299	4,99,691	3,67,085	2,47,704	2,13,723	97,548	49,765	46,496	8,517	23,318
29,65,143	15,42,969	17,86,080	15,14,045	31,57,783	32,85,709	18,17,833	15,89,816	28,35,980	24,11,675	23,29,971	11,32,286
19,137	1,82,255	65,009	1,31,037	1,52,449	90,040	1,98,017	3,70,506	5,45,425	7,94,228	5,55,973	8,40,501
21,134	18,756	19,827	17,465	18,298	29,642	13,900	5,417	27,744	20,049	19,793	1,713
...	...	...	...	...	...	...	...	...	...	7,264	5,216
5,006	499	908	7,158	26,718	11,889	34,742	3,72,612	2,90,573	61,440	5,693	18,593
40	150	2,825	4,952	67	250	257	3,016	10,207	13,521	84,519	62,148
1,542	320	4,166	31,815	1,110	140	1,628	34,530	6,948	4,888	8,278	3,562
9,734	9,972	15,499	7,064	6,460	17,346	49,125	7,670	43,701	11,153	25,465	37,386
26,16,823	31,51,043	32,75,002	51,71,025	71,44,805	66,11,326	58,82,952	64,18,801	38,12,654	35,26,033	49,49,899	29,99,747
9,77,167	3,61,509	8,77,643	9,26,163	20,32,020	12,34,896	5,67,410	6,87,203	5,20,498	3,54,863	2,63,213	3,54,696
38,656	26,260	56,450	1,11,600	34,628	55,970	1,14,290	1,31,322	60,798	15,260	75,700	1,39,096
2,81,180	2,32,843	2,52,015	3,28,285	7,30,737	7,01,750	8,02,255	3,74,092	2,93,352	3,31,853	1,86,146	1,31,586
1,04,42,726	94,73,358	1,02,69,918	1,37,28,842	3,28,75,942	4,18,80,734	2,92,80,150	2,79,27,936	2,24,24,252	1,99,70,423	2,01,10,557	2,03,73,230

C.

Indus from the year 1856-1862, *and* 1865-1868.

DOWN TRAFFIC.									MONTHLY GROWTH OR DECLINE OF TRAFFIC.			
BOATS LADEN WITH MERCHANDIZE: THROUGH TRAFFIC.			BOATS DISCHARGING THEIR MERCHANDIZE AT SUKKUR.			BOATS LEAVING THE BUNDER WITH MERCHANDIZE.			UP RIVER.		DOWN RIVER.	
Number of boats.	Burthen in Maunds.	Quantity of merchandize in Maunds.	Number of boats.	Burthen in Maunds.	Quantity of merchandize in Maunds.	Number of boats.	Burthen in Maunds.	Quantity of merchandize in Maunds.	Increase of traffic in Maunds.	Decrease of traffic in Maunds.	Increase of traffic in Maunds.	Decrease of traffic in Maunds.
1,188	526,000	506,000	2,210	927,500	897,000	2,288	818,000	776,000	124,100	134,600	370,000	101,000
1,164	571,500	517,800	2,077	1,002,300	940,339	3,097	913,760	848,057	141,500	176,000	516,000	328,800
60	36,640	32,441	2,440	1,164,324	1,124,103	2,189	795,327	681,932	28,498	88,171	183,636	176,873
87	23,050	19,340	2,014	976,321	845,096	2,430	704,109	646,843	197,511	8,726	106,936	485,190
348	259,900	117,269	918	451,550	205,717	978	435,285	131,343	1,108,382	...	301,814	744,363
402	395,918	173,713	940	509,010	156,902	929	478,390	182,657	124,478	373,529	114,824	162,731
181	282,686	70,216	479	215,430	89,040	646	320,777	135,170	78,420	448,219	31,631	228,439
745	572,819	349,237	5,555	2,100,851	1,604,968	3,354	1,236,020	908,165	76,637	84,643	483,710	378,699
1,017	741,859	457,169	2,034	1,179,685	763,585	6 313	3,013,368	1,883,428	594,910	83,149	536,834	578,835
1,916	729,388	507,664	1,580	692,695	469,404	860	3,202,042	2,166,630	684,243	44,524	921,903	579,189

(Signed) J. HOWE,

Conservator of the Indus.

APPENDIX D.

Goods carried by the Sind Railway to Kurrachee.

Description of Goods.	1868.	1869.	1870.	Total.	Average.
	Tons.	Tons.	Tons.	Tons.	Tons.
DOWN—					
Seeds	15,459	3,807	8,933	30,299	10,096
Cotton	5,539	7,699	13,170	26,408	8,802
Wool	3,855	2,949	2,763	9,567	3,189
Ghee and Oil	1,571	1,467	2,005	5,043	1,681
Grain and Pulse	21,844	6,578	5,180	33,602	11,201
Drugs and Medicines	...	...	9	9	3
Metals	...	...	7	7	2
Government Stores...	437	156	18	611	203
Iron	...	...	4	4	1
Sugar	...	...	2	2	1
Spices	...	...	8	8	3
Miscellaneous	16,202	10,672	7,387	34,261	11,420
					46,602
Seeds	...	...	6	6	2
Grain and Pulse	...	...	2,816	2,816	938
Ghee and Oil	...	...	17	17	6
Iron	6,906	4,068	2,415	13,389	4,456
Spices	105	181	274	560	186
Steel	...	...	...	...	...
Sugar	2,504	2,357	2,196	7,057	2,352
Cloths	2,589	2,793	2,536	7,918	2,630
Metals	615	628	454	1,697	566
Coal	5,435	496	....	5,931	1,977
Drugs	...	...	1	1	...
Railway Materials	4,507	1,162	1,545	7,214	2,404
Miscellaneous	12,522	14,004	20,008	46,534	15,511
Commissariat Stores	6,963	7,150	2,473	16,586	5,528
					36,565

APPENDIX E.

Statement of registered burthen of boats taken at Kotree.

For what year.	Receipts.	Total amount of Maunds.	REMARKS.
	Rs. A. P.		
1862	19,399 0 0	1,611,465	
1863	39,457 0 0	1,893,956	
1864	49,996 0 0	2,399,849	
1865	39,669 0 0	1,904,141	
1866	44,187 0 0	2,120,984	
1867	37,718 0 0	1,791,810	
1868	41,208 9 4	1,978,012	
1869	33,567 10 4	1,611,247	
1870	35,902 6 4	1,723,315	= 63,357 tons.

(Signed) J. HOWE,
Conservator of the Indus.

APPENDIX F.

Approximate Estimate of the cost of constructing a line of Railway between Kotree and Rohree, along the left bank of the Indus.

Distance 203½ miles ... ... { Gauge ... ... 3′ 3″ / Formation width ... 10′ 3″

Description.	Quantity.	Rate.	Per	Amount.	Total.
Earthwork.		Rs. A. P.		Rs.	Rs.
Ordinary	1,020,000	0 2 0	C. Yd. ...	1,27,500	
Ballast, including 10 per cent. for sidings	400,000	1 0 0	Do. ...	4,00,000	
					5,27,500
Fencing for 20 miles	...	1,320 0 0	Mile ...	26,400	26,400
Permanent Way.					
40-lbs. rail with 1-10th for fastenings, 70 tons, @ £14 per ton	14,245	140 0 0	Ton ...	19,94,300	
Sleepers 2,000, each 5½′ × 10″ × 4¼″= 1·625 cubic feet each, or 3,250 cubic feet per mile @ Re. 1	203½	5,687 8 0	Mile ...	11,57,406¼	
Laying	203½	800 0 0	Do. ...	1,62,900	
				33,14,506¼	
Add 10 per cent. for Sidings ...	...	...	Do. ...	3,31,450	
					36,45,957
Bridges.					
Medium and small at 2,000 per mile ...	203½	2,000 0 0	Do. ...	4,07,060	4,07,000
Electric Telegraph	203½	1,000 0 0	Do. ...	2,03,500	2,03,500
Rolling-stock for 2 trains each way.					
20 Engines	20	20,000 0 0	Engine ...	4,00,000	
400 Vehicles	400	1,500 0 0	Vehicle ...	6,00,000	
					10,00,000
Stations.					
1st Class	2	75,000 0 0	Each ...	1,50,000	
2nd „	8	22,500 0 0	Do. ...	1,80,000	
3rd „	9	15,000 0 0	Do. ...	1,35,000	
				90,000	4,65,000
Road Crossings	60	1,500 0 0	Do. ...		
Occupation Crossings	100	300 00	Do. ...	30,000	
Wells, Pumps, Tanks, Cranes, Engine Ash-pits	203½	760 0 0	Do. ...	1,54,660	1,20,000 1,54,660
Engineering Superintendence ...	203½	5,500 0 0	Do. ...	11,19,250	
Agency	203½	2,500 0 0	Do. ...	5,08,750	
					16,28,000
GRAND TOTAL ...	...	...	...	...	81,78,017

Estimate for the Left Bank line in the form of the English Committees' Estimates.

Description.	Total.	Per mile.
	Rs.	Rs.
Earthwork	1,27,500	627
Permanent way— 36,45,957 / 4,00,000	40,45,957	19,882
Bridges	4,07,000	2,000
Stations	4,65,000	2,285
Rolling-stock	10,00,000	4,910
Telegraphs, Crossings, and Fences	3,49,900	1,720
Wells, Pumps, Tanks, Cranes, Engine Ash-pits	1,54,660	758
Engineering and Agency	16,28,000	8,000
	81,78,017	40,182
Bridge over the Indus below Kotree, 2,555 running feet, at £150 per foot run ...	38,32,500	18,832
TOTAL ...	1,20,10,517	59,014
Add, if the Rolling-stock is doubled	10,00,000	4,910
GRAND TOTAL ...	1,30,10,517	63,924

Estimate for the Left Bank Line, if the length be reduced to 188½ miles, at Rs. 45,072	Rs.	84,96,072
Indus Bridge below Kotree	„	38,32,500
TOTAL ...	„	1,23,28,572

APPENDIX G.

Approximate Estimate of the cost of constructing a line of Railway between Kotree and Sukkur along the right bank of the River Indus.

Distance 222½ miles ... { Gauge ... ... 3′ 3″ / Formation width ... 10′ 3″

Description.	Quantity.	Rate.	Per	Amount.	Total.
		Rs. A. P.		Rs.	Rs.
Earthwork.					
Ordinary	1,775,704	0 2 0	C. Yd.	2,21,963	
Rock	163,809	2 0 0	Do.	3,27,618	
Ballasting	400,000	1 0 0	Do.	4,00,000	
10 per cent. for siding, &c.	40,000	1 0 0	Do.	40,000	
					9,89,581
Fencing for 20 miles	...	1,320 0 0	Mile.	26,400	26,400
Pitching slopes	20,000	1 4 0	Sq. Yd.	25,000	25,000
Permanent Way.					
40-lbs. rail with 1-10th for fastenings, 70 tons, @ £ 14 per ton	15,575	140 0 0	Ton.	21,80,500	
Sleepers, 2,000, at 5½′ × 10′ × 4¼″ = 1·625 cubic feet each, or 3,250 cubic feet per mile, @ Re. 1-12-0	222½	5,687 8 0	Mile.	12,65,468¾	
Laying	222½	800 0 0	Do.	1,78,000	
				36,23,968¾	
Add 10 per cent. for sidings ...	...	...	...	3,62,397	
					39,86,365
Bridges.					
Sunn River— 1,200 feet @ Rs. 400	...	...	...	4,80,000	
Small Bridges— @ Rs. 1,000 per mile	...	...	...	2,22,500	
River Groins at base of Sehwan hills ...	...	...	...	50,000	
					7,52,500
Electric Telegraph.					
222½ miles @ Rs. 1,000	...	...	...	2,22,500	2,22,500
Rolling-stock.					
For 2 trains each way daily, 22 Engines @ Rs 20,000	...	...	...	4,40,000	
440 Vehicles @ Rs. 1,500	...	...	...	6,60,000	
					11,00,000
Stations.					
Two 1st Class	...	...	...	1,50,000	
Two 2nd „	...	...	...	45,000	
Twelve 3rd „	...	...	...	1,80,000	
					3,75,000
Road Crossings	28	1,500 0 0	Each.	42,000	
Occupation roads	181	300 0 0	Do.	54,300	
					96,300
Wells, Pumps, Tanks, Cranes, Engine Ash-pits, &c., for	222½	760 0 0	Mile.	1,69,100	1,69,100
Engineering Superintendence ...	222½	5,500 0 0	Do.	12,23,750	
Agency	222½	2,500 0 0	Do.	5,56,250	
					17,80,000
GRAND TOTAL ...	...	...	...	...	95,22,746

APPENDIX G.—(*continued*).

Estimate for the Right Bank line in the form of the English Committees' Estimate.

Description.		Total.	Per mile.
			Rs.
Earthwork and Rockwork	5,49,581	5,49,581	2,470
Permanent Way	39,86,365 / 4,40,000	44,26,365	19,890
Bridges		7,02,500	3,160
River Groins and pitching slopes		75,000	337
Stations		3,75,000	1,690
Rolling-stock		11,00,000	4,950
Telegraphs, Crossings and Fences		5,14,300	2,310
		77,42,746	34,807
Engineering and Agency		17,80,000	8,000
		95,22,746	42,807
Bridge from Rohree to Sukkur for slow trains, suspended girder principle— 1 Span, 600 feet, at £100 per foot	£60,000		
2 Spans 1 of 261 / 1 of 220½ / 481½ @ £50 per foot	24,075		
	£84,075		
Connecting embankment	£5,925		
	£90,000	9,00,000	4,045
TOTAL, Rs. ...		*1,04,22,746	46,852
Add, if Rolling-stock be doubled		11,00,000	4,950
		1,15,22,746	51,802

* *N. B.*—This does not include any estimate for a large bridge such as that across the Indus or the Sutlej. It allows rolling-stock sufficient only for two trains each way per diem. It provides for stations of such simple materials as, in the dry climate of Upper Sind, are found to be sufficiently durable. The rails are laid on longitudinal sleepers.

APPENDIX H.

Comparative Statement of passenger traffic and population in countries provided with Railways.

	Population.	Area in square miles.	Length of Railway.	Length of Railway per million of population.	Length of Railway per 1,000 square miles of territory.	Number of passengers booked daily.	Number of passengers booked daily per 1,000 inhabitants.	Average distance travelled daily by passengers.	Average daily mileage of passengers per 1,000 inhabitants.	Remarks.
United Kingdom in 1847 ...	27,019,558	121,050	5,000	185·0	41·3	*173,779	6·4	16·54	106	* When there were only 4,500 miles of Railway.
Belgium ...	4,335,319	11,256	457	105·2	40·3	10,087	2·32	22·6	52·4	
District affected by the Madras Railway from Madras to Goriattum ...	1,500,000	2,400	96	64	40	720 2,500	·480 1·66	39 38	18·7 63·08	Before the reduction. After the reduction in the passenger rates.
Hydrabad Collectorate (Northern portion)...	†460,000	*4,600	120	250	25	480	1¼	30	50	These are merely estimated.

* Allowing that the Railway local traffic affects the districts within 20 miles of the Railway on either side.
† Taking it at 100 to the square mile, as the portion of the district traversed by the line will, before long, probably have considerably more than the average population per square mile the average being 64.

APPENDIX I.

Approximate Estimate of the probable Receipts to be expected from the Sind Valley Railway.

This may be divided into the receipts from—

1*st.*—Local traffic in passengers and goods.

2*nd.*—Through ditto ditto ditto.

	Length of Railway.	Population.	Probable receipts from Passengers per annum.	Net Local Traffic Receipts.
Right Bank of the Indus.			Rs.	Rs.
From Kotree to Sehwan	81 miles.	29,803	8,494	
From Sehwan to Sukkur	141½ „	549,483	1,55,040	
			1,63,534	1,23,956
Through traffic Net Receipts, 5 pies per ton per mile, on 38,740 tons	...	...	...	2,24,470
Total Net Receipts ...	...	...	...	3,48,426
Left Bank of the Indus.				
1.—Kotree to Ali Morad's Frontier	188½ „	599,240	1,68,985	1,28,237
2.—Through Ali Morad's Territory				
Through traffic Net Receipts, 5 pies per ton per mile, on 29,240	...	...	...	1,44,000
Total Net Receipts ...	...	...	...	2,72,237

The total cost of the Right Bank line is estimated at Rs. 1,15,22,746, or £1,152,275. The net receipts are estimated at £34,842, or 3·02 per cent. on the above sum; but if the working charges are 60 per cent. of the gross receipts, this figure will be reduced to 2·41 per cent.

The total cost of the Left Bank line is estimated at Rs. 1,23,28,572 or, £1,232,857. The net receipts are estimated at £36,[illegible], or 2·[illegible] per cent. on the above sum; but if the working charges are 60 per cent. of the gross receipts, this figure will be reduced to 1·78 per cent.

Add Rs. 41,508 for the difference between the receipts from through goods on the Right and Left Bank, yielding ... ... 0·338 per cent.

2·118

The receipts from passengers are deduced from the population as follows:—

The daily passengers' mileage is assumed to be 5 per 1,000 inhabitants per diem, and the receipts 3 pies per passenger mile. This makes the annual receipts $\frac{365 \times 50 \times 3}{192}$ = Rs. 285 per thousand inhabitants, or ·285 Rupee per head of the population; adding 50 per cent. for the local goods traffic, and assuming the working expenses to be 50 per cent. of the gross receipts, we have the net local traffic receipts ·285 × ½ × ½ = ·214 Rupee per head of the population.

Probable through traffic from Sukkur and Kotree.

Right Bank Line.

	Tons.
1. Average from the centre of trade on the right bank to Kotree, equivalent to	15,300
2. *Trade from above Sukkur—*	
1. Portion carried by steamers	20,900
2. Ditto by boats	2,540
Total ...	38,740

Left Bank Line.

1. Average from the centre of trade on the left bank to Kotree, equivalent to	5,800
2. Trade from Sukkur as above	23,440
Total ...	29,240

APPENDIX K.

Comparative Estimate for a line from Kotree to Sehwan and a branch line from the left bank main line to the left bank of the Indus, nearly opposite Sehwan, a bridge across the Indus, and a short branch line on the right bank of the Indus, these two branches and the bridge being intended to connect the left and right bank main lines.

1.—*Line from Kotree to Sehwan, 81 miles.*

	Quantity.	Rate.	Per.	Amount.	TOTAL.
Earthwork.	C. Yds.	Rs. A. P.		Rs.	Rs.
Ordinary	741,416	0 2 0	C. Yd.	92,677	
Rockwork	34,271	2 0 0	Do.	68,542	
Permanent Way... ...	81 Miles.	19,900 0 0	Mile.	16,11,900	
River groins and pitching slopes ...	...	...	...	75,000	
Bridge, Sunn River	...	...	...	4,80,000	
81 miles of small bridges, @ Rs. 1,000 per mile	...	...	...	81,000	
Stations, 7, 3rd Class	...	15,000 0 0	Each.	1,05,000	
Rolling-stock	81	4,950 0 0	Mile.	4,00,950	
Telegraphs, Crossings, and Fences ...	81	2,000 0 0	Do.	1,62,000	
Engineering and Agency	81	8,000 0 0	Do.	6,48,000	
TOTAL ...	...	...	...		37,25,069

2.—*Junction of the right and left bank lines.*

	Quantity.	Rate.	Per	Amount.	TOTAL.
Right Bank.	Miles.	Rs. A. P.		Rs.	Rs.
Earthwork	4¾	1,150 0 0	Mile.	5,463	
	C. Yds.				
Rockwork	34,271	2 0 0	C. Yd.	68,542	
River groins and pitching slopes ...	...	...	...	75,000	
Permanent Way	4¾ Miles.	19,900 0 0	Mile.	94,525	
Bridges, small	...	...	...	10,000	
Left Bank.					
23 miles without Rolling-stock, @ Rs. 30,000 per mile	...	...	...	6,90,000	
Bridge across the Indus at Sehwan, including Rs. 10,00,000 for protective works ...	...	...	...	48,32,500	
Rolling-stock	81 Miles.	4,950 0 0	Mile.	4,00,950	
Engineering and Agency, @ Rs. 10,000 per mile	...	...	...	1,77,500	
TOTAL ...	...	...	...		63,54,480

Approximate Estimate of the cost of a line from Rohree vid Sukkur to Sehwan, and from Sehwan to the left bank of the Indus, and thence to Kotree vid Hydrabad.

1.	Cost of a line from Sukkur to Kotree, as per estimate	Rs.	1,15,22,746
	Deduct portion from Sehwan to Kotree, as per estimate ...	,,	37,25,069
	Total	Rs.	77,97,677
	Add junction of the right and left bank lines	,,	63,54,480
	Add for 75 miles from the junction to Kotree @ Rs. 40,153 per mile, exclusive of the bridge across the Indus at Kotree ...	,,	30,11,475
	Bridge over the Indus at Kotree	,,	38,32,500
	Total from Rohree to Kotree *vid* Sukkur, Sehwan and Hydrabad	Rs.	2,09,96,142

Total distance, $141\frac{1}{2} \times 27\frac{1}{4} \times 75 = 244\frac{1}{4}$ miles.
Cost per mile ... ... Rs. 86,000

Abstract of Khetty Exports and Imports.

		1868.	1869.	1870.	Total.	Tons.	Average.
Exports.							
Seeds	Cwts.	160,469 $\frac{33}{112}$	92,989 $\frac{104}{112}$	107,366 $\frac{95}{112}$	360,815 $\frac{16}{112}$	18,041	6,013
Oil	Galls.	18,867¾	12,896½	8,805⅓	39,569¾	180	60
Cotton and Wool ...	lbs.	70,502	367,392	358,944	796,848	356	118
Wool	,,	1,790,328	1,539,804	2,318,304	5,648,436	2,521	840
Ghee	Cwts.	1,926 $\frac{23}{112}$	941 $\frac{104}{112}$	3,104 $\frac{85}{112}$	5,973	299	99
Grain and Pulse ...	,,	720,798 $\frac{85}{112}$	458,686 $\frac{63}{112}$	117,584 $\frac{84}{112}$	1,297,070 $\frac{44}{112}$	64,853	21,617
Drugs and Medicines ...	,,	18,617 $\frac{48}{112}$	10,914 $\frac{88}{112}$	24,680 $\frac{16}{112}$	54,212 $\frac{40}{112}$	2,711	903
Metals	,,	96 $\frac{84}{112}$	14 $\frac{100}{112}$	26 $\frac{60}{112}$	138 $\frac{20}{112}$	6	2
Spices	,,	12 $\frac{56}{112}$	7 $\frac{56}{112}$	...	20	1	...
Iron	,,	...	...	...	...	...	...
Sugar	,,	1,383 $\frac{88}{112}$	71 $\frac{70}{112}$	436 $\frac{88}{112}$	1,891 $\frac{88}{112}$	94	31
Steel	,,	...	...	...	...	...	...
							29,683
Imports.							
Seeds	Cwts.	938 $\frac{56}{112}$	217 $\frac{140}{112}$	213 $\frac{77}{112}$	1,469 $\frac{61}{112}$	73	24
Oil	,,	54	4½	54	112½	6	2
Cotton and Wool ...	lbs.	2,012	744	992	3,748	2	1
Cocoanut nut or Kernal	Cwts.	2,724 $\frac{103}{112}$	2,855 $\frac{44}{112}$	1,088 $\frac{44}{112}$	6,668 $\frac{84}{112}$	333	111
Ghee	,,	...	22 $\frac{44}{112}$	...	22 $\frac{44}{112}$	1	...
Fruit and Vegetables ...	,,	9,723 $\frac{44}{112}$	6,903 $\frac{104}{112}$	11,871 $\frac{104}{112}$	19,748 $\frac{44}{112}$	987	329
Grain and Pulse ...	,,	320 $\frac{14}{112}$	4,122 $\frac{84}{112}$	12,772 $\frac{84}{112}$	16,214 $\frac{84}{112}$	811	270
Drugs and Medicines ...	,,	2,498 $\frac{84}{112}$	4,225 $\frac{84}{112}$	3,061 $\frac{84}{112}$	9,785 $\frac{84}{112}$	489	163
Iron	,,	105,287 $\frac{84}{112}$	53,177 $\frac{84}{112}$	37,893 $\frac{84}{112}$	196,357 $\frac{84}{112}$	9,818	3,273
Steel	,,	4,731 $\frac{84}{112}$	4,148	5,541	14,420 $\frac{84}{112}$	721	240
Spices	,,	4,090 $\frac{84}{112}$	6,531 $\frac{28}{112}$	5,149 $\frac{104}{112}$	15,771 $\frac{28}{112}$	788	263
Sugar	,,	3,472 $\frac{84}{112}$	5,002 $\frac{76}{112}$	4,474 $\frac{48}{112}$	13,949 $\frac{44}{112}$	697	233
							4,909

ABSTRACT.

During the last three years the actual registered river traffic was:—

Down.

	Tons.	
Sind Railway	46,602	
Khetty	29,683	
		76,285

Up.

	Tons.	
Sind Railway	36,565	
Khetty	4,909	
		41,474
Total both ways, Tons ...		117,759

In the above, however, many articles which are only mentioned in the Customs Returns of Khetty in numbers are not included.

(Sd.) T. DOWDEN, *Captain*, R. E.
Deputy Consulting Engineer, Sind Railway.

March 24, 1871.

SIND, PUNJAB AND DELHI RAILWAY COMPANY.

(INDUS STEAM FLOTILLA.)

Statement of goods conveyed from station to station from 1862 *to* 1870.

Half year ending	Kotree to		Sukkur to		Mooltan to	
	Sukkur.	Mooltan.	Kotree.	Mooltan.	Kotree.	Sukkur.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
1862 December (8 Months) ...	11,490	58,890	27,454	3,010	81,565	6,878
1863 June	5,841	72,691	17,146	1,291	54,318	13,685
„ December	12,543	83,954	43,077	5,343	63,595	11,581
1864 June	11,401	114,013	143,505	1,227	20,142	7,662
„ December	23,390	92,826	49,819	8,296	82,673	11,045
1865 June	14,326	111,784	38,431	15,196	48,204	27,085
„ December	30,967	90,941	73,202	12,255	94,566	43,042
1866 June	8,375	43,162	60,062	707	125,436	27,229
„ December	26,568	76,756	54,370	12,005	79,930	15,717
1867 June	24,702	79,937	46,404	977	73,258	14,108
„ December	28,346	144,528	57,313	976	72,256	7,365
1868 June	25,275	127,160	58,236	6,520	63,752	15,061
„ December	26,151	160,709	84,119	807	47,262	14,394
1869 June	26,994	147,497	52,527	22,416	57,185	28,955
„ December	33,957	143,910	39,232	5,829	55,188	20,981
1870 June	26,321	152,139	52,469	10,452	124,535	58,160
„ December	41,412	207,331	84,353	2,380	46,116	40,524
	378,059	1,908,228	931,719	109,687	1,189,981	363,472

(Sd.) J. CAMBELL,
Accountant, &c., in Sind.

(Sd.) JOHN WOOD, *Captain,*
Agent in Sind.

Statement giving information supplied by W. Cole, Esq., Collector of Customs, respecting the Trade of Sind.

QUERY.

1*st*.—At the end of the Chamber's report for 1867-68, there are comparative statements of Imports and Exports up to that year. Will you give us the same information for the following years.

2*nd*.—Your opinion as to how much of the export Wool comes into Kurrachee by the hill routes, and how much down the Indus by Native boats, and the Flotilla. Also as to whence the greater part of the Wool is obtained.

3*rd*.—Names of the different kinds of seed comprised under the general head of Oil-seeds, and the kind most valuable and likely to increase, supposing its production in the Indus Valley to be increased.

REPLY.

You will find this information in the Chamber's reports for 1868-69 and 1869-70, sent to you with the report for 1867-68. The whole particulars were furnished from this office.

Taking five years from the 1st of January 1866, I find a little upwards of nine lakhs of maunds of wool exported. Of this about one-third was brought down the Indus by Native boats and Indus Steam Flotilla, and the remainder principally by the hill routes.

From Khorasan (Afghanistan) decidedly.

Chiefly Rape or Sursee seed, Mustard seed, and Gingely or Teel seed.

Rape and Gingely are the most valuable, and likely to increase in quantity.

Our exports of Oil-seeds are almost entirely of these latter.

No. 2191R, dated Simla, 30th October 1871.

From—MAJOR E. C. S. WILLIAMS, R. E., Depy. Secy. to the Govt. of India, P. W. DEPT.,
To—The Cons. Engr. to the Govt. of India for Guaranteed Railways, Lahore.

The Government of India have had under consideration the question of extending railway communication in the valley of the Indus from Rohree (Sukkur) to Kotree, and have come to the conclusion that the line should be carried on the right bank. A copy of the report of a Committee appointed in February last to consider the question on the spot, is enclosed for your information.

2. A detailed survey of the country during the ensuing cold season, and the preparation of a project and estimate now remain to be taken in hand, and I am directed to state that the necessary staff will be at once detailed for this purpose in accordance with the following general instructions. Major Bonus has been selected to superintend the survey, and he will be directed to report himself to you immediately on the conclusion of a special enquiry in which he is at present engaged.

3. In 1863-64 Mr. Brunton surveyed this line from Kotree to Sukkur, and the following drawings, prepared under his direction, are available, and are herewith forwarded for Major Bonus's use :—

Index Nos.		Scale.
12, 13, 20.	Plan of line from Kotree to Sukkur ...	4″ to 1 mile.
16.	Section longitudinal, horizontal ...	4″ to 1 „
21.	„ „ vertical ...	1″ to 20′
14.	Enlarged plan and section, Lukkee Pass	1″ to 4 chains.
15.	Cross-sections at Lukkee Pass ...	1″ to 10′
17.	Sections of Sunn and other rivers, horizontal	1″ to 2 chains.
	„ „ „ „ vertical	1″ to 10 „
18.	Sections of canals, nullahs, streams ...	1″ to 10′
22.	Enlarged sections of principal channels...	1″ to 10′
23.	„ plan of Sukkur Pass, Sukkur, Bukkur and Rohree	16″ to 1 mile.
24.	Enlarged section of Sukkur and Rohree Channels of Indus	1″ to 10′
25.	Section of line from Kurrachee to Sehwan, horizontal	1″ to 20 chains.
	„ „ „ „ vertical...	1″ to 50′
26.	General map	1″ to 20 miles.

In addition to these plans, the trigonometrical survey levels from Kotree to Sehwan, taken along the high road close to Mr. Brunton's line, and from Sehwan to Shikarpoor, opposite to Sukkur, taken along the sides of a minor triangulation, embracing the continuation of this road, have been published by the Great Trigonometrical Survey Department, and should be procured. There are thus numerous bench marks and fixed points from which to start isolated lines of level, and by which to check all sections.

4. It is known that Mr. Brunton was much in favor of the left bank line, but this bias could not affect the accuracy of the surveys and sections made under his direction. Mr. Brunton's line may be assumed to be correct until found to be otherwise. Acting on this view, and bearing in mind that the location of the line so far as possible during the coming season is desirable, the engineers should proceed to locate the line in accordance with Mr. Brunton's plans and sections, except in places where the officer in charge of the Survey may, after reconnoissance, see the desirability of trying to improve the route, the location of the line in those places being left undetermined until the feasibility or non-feasibility of the deviations has been ascertained.

5. The attention of the Engineer in charge of the Survey may also be directed to the following points :—

1*st*.—The crossing of the Sunn River, and the location of the line for three or four miles on the Kotree side of it, appears to be unsatisfactory. A wide crossing appears to have been selected, although from the plan it appears that a much more contracted crossing

might have been adopted by keeping nearer to the Indus, thus accommodating the town of Magunda and the villages that are sprinkled along the line of road; or, should this be not practicable, a line farther from the Indus, following the direction of some of the lines that have been roughly indicated on the plan. Such a deviation might wind round by sharper curves, and, if necessary, rise in gradients so as to obtain higher land, and to round the spurs which appear to run down on either side of the river. The line, as at present laid on the plans, passes through low districts, so that at four miles from the River Sunn the formation level is 16 feet below the surface of the water in the Sunn, and 10 feet below its bed.

2nd.—Between the 65th and 71st mile from Kotree, a deviation appears to be practicable for saving the numerous crossings of the canals at that portion of the line. A possible deviation at that spot is roughly indicated on the map.

3rd.—At the Lukkee Pass it seems desirable to keep farther from the river, even at the expense of more earthwork and rock cutting, in order to avoid, if possible, the objectionable retaining walls on the bank of the Indus. This deviation is roughly sketched in blue on the enlarged plan of the Lukkee Pass. The curves at this point might be much sharper than shown on Mr. Brunton's plan, and a steeper gradient might be introduced to save rock cutting.

4th.—Before adopting Mr. Brunton's line between the points of Sehwan and Larkhana, it will be well to ascertain by reconnoissance whether it is worth while to make a trial section of a line which will avoid a portion of the floods from the Indus. The line that suggests itself for examination has been marked by a blue line on the general map No. 26, Starting from the Lukkee Pass it winds round the Muncher Lake to Sha Hassain, and thence through Johoye, Peer Gaza, Mher and Nussecrabad to Larkhana, thus avoiding altogether the Western Narra. The reconnoissance might be made along the line of road.

5th.—A deviation from the 187th mile to the junction of the trace with the "new supply channel" appears to give a more direct line, and there are no data to show that the direct line would not be equally good with the line marked on the plan. This deviation has also been marked for examination on the plan.

6. The following strength of staff to be placed under the orders of the Superintending Engineer in charge, seems to the Government of India to be suitable for the work that has to be done, and endeavours will be made to provide the necessary officers without delay :—

One survey party of one Executive and two Assistant Engineers will be required for the Kotree-Sehwan section, not necessarily to make a new survey of the whole, but to run isolated levels and make partial surveys of deviations from Mr. Brunton's lines, where thought necessary.

For the remaining portion of 138 miles, two parties will be required, as there will be much cross levelling to be done. One Executive Engineer and two Assistants would seem to be a proper staff for each party, with one Extra Assistant to provide for illness and for special employment, such as testing the accuracy of the cross sections of the Indus, &c.

7. One party should commence at once to locate the line from Kotree towards Sehwan. A second, pending the completion of the reconnoissance of the proposed deviation between Sehwan and Larkhana, might examine the proposed deviations at the Sunn River, so as to determine the best direction, in anticipation of the arrival of the first party with their location.

After the completion of the reconnoissance, the second party might commence operations on the line which the reconnoissance might decide to be the more eligible between Sehwan and Larkhana.

The third party might commence the location of the line from Sukkur towards Larkhana, adopting the line along the "new supply channel."

The extra Assistant might commence with an examination of the suggested alteration at the Lukkee Pass.

8. The Engineers should be instructed to collect all information possible with regard to the extraordinary flood levels, the extent and duration of floods, and the amount of waterway to be given; and they should further report on the question of the water supply at various parts of the line, and upon the relative fertility and resources of the districts through which the line passes, as well as upon the comparative importance of the towns in the vicinity.

9. You will be good enough to make immediate arrangements for tents, instruments, &c., so that the parties may take the field at the earliest possible moment. In the preparation of the estimates on the completion of the surveys, the standard dimensions for the metre gauge will be followed, and all needless labor in getting out detailed designs of iron work should be avoided. It will be best to consider at first the executive divisions into which the work is likely to be divided, and to estimate separately for each. The sleepering of the line may, it is believed, be done from the Bubbur Forests of Lower Sindh. All needful data for the preparation of a design for a bridge over the Indus at Sukkur should also be collected.

No. 2192—93 R.

Copy to Government of Bombay, in the Public Works Department (Railway), with reference to its No. 909, dated 1st August 1871.

Also to the Government of the Punjab, in the Public Works Department, for information.

No. 126R, dated Simla, 31st October 1871.

From—The Government of India,

To—The Secretary of State for India.

In reporting to your Grace in despatch No. 19 of 1871 the steps taken for the construction of the section already sactioned of the Indus Valley Railway between Mooltan and Rohree, we also forwarded copy of a Resolution issued by us on the 9th February 1871, appointing a Committee to investigate locally and report on the route that might be selected as the most advantageous on commercial, financial, and political grounds for providing railway communication between Rohree on the left bank and Kotree on the right bank of the Indus. We have now the honor, with reference to paragraph 6 of your Grace's despatch No 34, dated 15th June 1871, to communicate the results of the enquiry then initiated.

2. In accordance with the instructions issued, the Committee, whose report will be found among the papers transmitted with this despatch, investigated the best means of joining Rohree and Kotree by a railway on a 3'-3" gauge, and considered the relative merits of lines on the right and left banks of the Indus.

3. The most complete system would, as previously observed by us, consist of lines on both banks, cannected by bridges. The cost of such a system, including rolling-stock for four trains each way on each line, a suspended girder bridge at Rohree (like the Niagara Bridge) for slow speed, and an iron girder bridge for full speed at Kotree, is estimated by the Committee at £2,335,132. This complete scheme, however, is, for evident reasons, out of the question for a long time to come.

4. If the Indus, then, be bridged only once, that is either at Rohree, Kotree, or midway between them at Sehwan, three Lines can be made:—

I. Left bank line with a bridge at Kotree.

This would be 188½ miles long, and is estimated to cost £1,232,857,* or about £6,540 per mile.

* These estimates include rolling-stock for four trains a day each way.

II. Right bank line with a bridge at Rohree.

This would be 222½ miles long, and is estimated to cost £1,152,274,* or £5,180 per mile.

III. Left-bank line from Rohree to Sehwan and right bank line thence to with a bridge at Sehwan.

The cost of this alternative is not given, but it is evidently considered unworthy of discussion, as it would pass through the worst portion of the country on each bank, and avoid the most prosperous territory.

5. There is one other alternative which may be alluded to, although the Committee dismiss it briefly. This is a right bank line from Sukkur to Sehwan, and a left bank line thence *viâ* Hydrabad to Kotree, with bridges at all three places. This would give a line 244½ miles long, and is estimated to cost £2,099,614, or about £8,600 per mile.

6. The foregoing estimates are largely affected by the cost of the bridges, namely, at—

	£
Rohree	90,000
Sehwan	483,250
Kotree	383,250

These bridges differ widely in character. That at Rohree must have one clear span of 600 feet, and is, therefore, designed as a suspended girder bridge for slow speed. The bridge at Sehwan would cross at a place where protective works estimated at £100,000 (which sum is included) would be necessary, but otherwise it would, like the bridge at Kotree, be a first class work.

7. The estimates are for lines on a 3′-3″ gauge, with a formation width of 10′-3″, 40 lbs. rails on cross sleepers 5′-6″ × 10″ × 4¼″ (2,000 to the mile), and with limited fencing. They include superintendence and establishment charges.

8. The Government of Bombay, which was asked to report on the conclusions of the Committee, has furnished, with a brief expression of general concurrence, a memorandum by their Consulting Engineer (which will be found among the papers) on the rough estimates of the Committee.

Colonel O'Connell, who was a member of the recent Committee, and to whom the Consulting Engineer's memorandum was forwarded for remark, accepts only one modification of the cost of construction by which the cost of the right bank line would be increased by Rs. 1,00,000. Thus the comparison by cost, according to Colonel O'Connell, would be, taking rolling stock for two trains each way daily, which is more than sufficient—

	£
Left bank line	1,140,000
Right bank line	1,050,000
Difference of cost in favor of right bank line	90,000

the respective lengths being—

	Miles.
Left bank line	188½
Right bank line	222½
Difference of length against right bank line	34

and, according to the Consulting Engineer to the Government of Bombay, the cost would be—

	£
Left bank line	1,205,000
Right bank line	1,140,000
Difference in favor of right bank line	65,000

Omitting the bridge over the Indus in each case, the estimates of cost are as follows:—

	Left bank.	Right bank.	Difference.
	£	£	£
Committee Report as agreed to be modified ...	757,400	962,300	204,900
Ditto ditto as modified by the Consulting Engineer, Bombay	820,300	1,017,700	197,400

It appears from these figures that, disregarding the bridges, the right bank line will be 34 miles longer than the left bank line, and will cost £200,000 more. It is in the bridging that the right bank line crossing the Indus at Sukkur, has the advantage over the left bank line crossing the Indus at Kotree.

9. The bridges are estimated as follows:—

	Committee.	Consulting Engineer.
	£	£
Sukkur ...	90,000	120,000
Kotree ...	383,250	383,250

Thus, if the cost of the bridges be included, it seems that the right bank line may, in the aggregate, cost from £60,000 to £90,000 less than the left bank line, but that the latter will be the shorter to work over and maintain. Looking, however, to the uncertainty of the cost of the bridges, we think it may be assumed that the total cost of both lines will be the same.

10. Under these circumstances the preference for either line must be based on their respective values from a political and military, as well as from a commercial point of view, for it appears an essential part of the scheme that the Indus should be bridged. The Committee are of opinion that traffic will never be carried across the river to a railway on the opposite side except, perhaps, at Sukkur (Rohree) where the banks are permanent, and that ferries at Kotree or Sehwan in place of bridges would be of no use should the left bank be adopted for the whole or a part of the extension. From an engineering point of view Sukkur is an admirable site for a bridge, although the large span that will be required may make a peculiar construction desirable. The bridging of the Indus at Kotree will in our opinion be a much more formidable matter than has been supposed in some quarters, while as respects any future extension towards the Bolan Pass, the left bank line having been decided upon between Mooltan and Rohree, the bridging of the Indus at Sukkur is certainly to be preferred. With reference to the military question as to whether it is necessary that the barrier of the Indus should be interposed between the frontier and the railway, it may be noted that, if the facility of placing troops at the Bolan Pass from the sea as well as from Upper India is an object, it can best be attained by the right bank line, as troops could be brought up from Kurrachee by that route while they could be brought down simultaneously from Upper India by the left bank line between Mooltan and Rohree.

11. The narrow gauge stock of the 500 miles between Mooltan and Kotree could not, however, be concentrated if the line were divided by the Indus at Sukkur, that is, if the construction of the bridge were postponed. In such a case, indeed, the working of through traffic would be facilitated, so long as the narrow gauge is not laid on the Sindh line, by carrying out the extension on the left bank, as otherwise there would be two breaks of gauge.

12. The right bank line has a further claim to the railway, inasmuch as it will traverse British territory throughout its course, whereas the left bank line below Rohree must pass for about 40 miles through Khyrpoor, the ruler of which State, Meer Ali Morad, was reported to be very averse to a railway passing through his dominions when the matter was under discussion some years ago.

13. The proposal to put the railway on the spoil bank of the projected canal on the left bank of the Indus, if made, has been condemned by the Committee. They state that the cost of the railway would be reduced by only £51,000, and they urge that the result of bringing together of two means of communication of unequal power is to greatly diminish the utility of the weaker one, and that the plan is altogether undesirable. In this view we entirely agree. There is no estimate among the enclosed papers showing the probable saving that might result from making the proposed canal suitable for irrigation only, and not for navigation; but from the project of the canal that has been received by us, it is observed that the additional works required in the shape of locks to render the canal a first class line of navigation are so few, and the expenses so small a portion of the cost of the whole project, that there can be little hesitation about their construction if the project be carried out. This confirms what was to be expected in a country like Sindh, namely that the difference of cost between an irrigation and navigation canal cannot be great, and it therefore seems proper that if an irrigation canal is to be made on the left bank of the Indus, it should also be adapted to navigation, and the railway should be placed on the opposite bank of the river, so as to afford to those districts, where there is no perennial canal either existing or proposed, an improved means of communication.

14. As respects the point at which the Indus should be bridged in connection with any railway extension from the Bombay side, it has hitherto been considered that Hydrabad is the point that should be made for by any railway from the east. The possible lines that have been mentioned are (1) from Amedabad by Deesa and Oomerkote, and (2) from Amedabad by Wudwan and Luckput. The distance by the first would be about 390 miles; by the second 460 miles, of which 76 miles are under construction; so that, by both routes, the same length of new line would have to be made. The comparison for present consideration, however, is not so much that of alternative lines from Hydrabad towards Bombay as of lines from alternative points on the Indus; and an inspection of the map suggests that, with a bridge at Sukkur, this connecting link might be made from Ajmere *vid* Jodhpoor, Jeysulmere, to Rohree. The length of this line would be about 410 miles.

15. The connection of Deesa with the Ahmedabad terminus of the Bombay and Baroda Railway, and the eventual junction of this military station with Ajmere (*vid*) Aboo and Palee, seem indeed necessary future extensions of our railway system, now that the undertaking of the Indore line and its probable extension northwards has put it out of the question to carry a railway from Baroda into the south of Rajpootana. Once this direct line of railway shall be established between Bombay and Upper India, the question of connecting it with Sindh may be expected to press for solution, notwithstanding the great physical difficulties to be encountered in traversing the desert with its formidable shifting sand hills, though these may perhaps be avoided by skirting the northern margin of the Runn. Many years must, however, elapse in our opinion before the question of the alignment of this railway will call for decision, and in the event of its being found hereafter that the most suitable route across the desert indicates Hydrabad as the point of junction rather than Sukkur, a second crossing of the Indus will be required, if that river be now bridged at Sukkur in consequence of the right bank being adopted for the extension between Rohree and Kotree. In this event we do not think that a bridge need be contemplated at Kotree, as a good ferry should suffice, at least for many years; but be this as it may, the contingency is so remote that the question now at issue may, we think, be decided without reference to it. The sketch (enclosure No. 5) exhibits the several connecting lines discussed in this and the preceding paragraph.

16. Returning now to the Indus Valley line, and regarding the commercial aspects of the case, your Grace will observe that the Committee have obtained the following data from investigations on the spot:—

The foreign traffic of the Punjab to be carried by rail through Sindh is calculated at 23,440 tons a year. This would pass over either line.

The foreign traffic of the right bank of the Indus is calculated at 40,000 tons, half of which would pass over a right bank line with a yearly ton mileage of 3,400,000 miles.

The foreign traffic of the left bank is calculated at 20,000 tons, half of which would pass over a left bank line, with a yearly ton mileage of 1,090,000 miles.

Computations are also made of the probable passenger traffic, which must, however, be hypothetical.

17. On these data, and assuming that 60 per cent. of the earnings are expended in working the traffic, the Committee estimate that the right bank line would pay 2·41 per cent., the left bank line 1·78 per cent., and the two lines, if both be constructed, 1·7 per cent. In other words, if the Government could borrow money at 4½ per cent., the general revenues would be annually burdened with £24,000 if the right bank line were made, £33,500 if the left, and £66,500 if both lines were made.

18. As to the comparative wealth of the districts that would be respectively traversed by the right and left bank lines, the Committee state that the right bank line between Kotree and Sukkur yields Rs. 19,00,000 of land revenue, while the left bank between Hydrabad and Rohree yields only Rs. 10,16,000. Taking the figures entered on the map attached to the Committee's Report it appears that, omitting the terminal talooks on both sides, the population of the talooks between Sukkur and Hydrabad is almost precisely equal* on the two banks, but that the revenue of the right bank talooks is Rs. 13,96,422 against Rs. 7,33,366 derived from the left.

	No.
* Right bank ...	415,669
Left Bank ...	414,862

19. It appears also that the right bank districts export more than twice as much as the left bank districts. Thus, with the same population, the right bank districts, owing to irrigation, are twice as wealthy, and afford to a railway the prospect of twice as much traffic as the left bank districts. A large irrigation canal has, however, been proposed below Rohree on the left bank, and it is not improbable, if the project be carried out, that, ere many years elapse, the left bank districts, already as populous, will be as rich and fertile as those on the right bank.

20. As to the probable returns, the estimates of traffic made by the Committee are very moderate and differ very widely from those of the Committee appointed by the Bombay Government in 1868, copy of whose report is enclosed. The Sindh railway traffic is about 80,000 freight ton-miles per mile open yearly, whereas the Committee's estimated traffic is only about 48,667 freight ton-miles per mile open. The Sindh line obtains the left bank traffic above Hydrabad, as well as that of the right bank, and the boat traffic trans-shipped at Kotree is largely in excess of what the right bank project is credited with, namely one-twentieth of that brought down in boats. But while the traffic is probably underestimated by the Committee the profits are, as suggested by the Consulting Engineer to the Government of Bombay, decidedly over-estimated, owing to the working expenses being taken too low. Instead of net profits of Rs. 3,48,426 on the right bank line, arrived at by the Committee, the following, judging from the actual facts of working on the Sindh line, would be more probable:

	Rs.
Gross traffic* ...	7,25,000
Working expenses ...	5,85,000
Profits ...	1,40,000

* Committee's estimate increased for through passengers.

or about 1·3 per cent. on the capital outlay. But, as already remarked, the estimate of gross traffic is very moderate; and if, as is not improbable, it should

1

be increased to Rs. 10,00,000, we might look for a profit of Rs. 3,50,000, which would afford a return of 3½ per cent. on the capital outlay on the line, stocked for two trains only each way daily.

21. The right bank will afford a better return than the left bank, with charges based on mileage rates; but the extra 34 miles to be worked over on the right bank is a disadvantage, and, in comparing the merits of the two lines, the same through charges for non-local traffic ought to be assumed over both. From the point of view, then, of the profits realised, there may not be much to choose between either bank; but if, as seems certain, the right bank will carry at least 10,000 more tons of local produce than the left, and still realise as much profit as the latter, the preference should be given to it.

22. It is apparent that we cannot calculate upon the Indus Valley Extension line as a direct remunerative work, however much we may succeed in keeping down its first cost. It is, however, more than probable that the sections of the railway already made will yield better returns than they now do, when the two ends are joined; and, though it cannot be expected that the full interest will be covered for a long time to come, there will be a moderate return, and a large advantage in the provision of a better outlet for the province of the Punjab.

23. On a perusal of the papers forwarded with this despatch, your Grace will, we trust, concur with us in thinking that the preponderance of authority is in favor of crossing the Indus by a bridge at Sukkur and proceeding to Kotree by the right bank.

24. First as regards the military considerations. In this respect the advantages are clear. We believe the Indus Valley line will be a line of as great strategical importance as any that has yet to be made in India, having regard to the possibility, however remote, of foreign invasion. In this respect we place its advantages before those of the Lahore and Peshawur line. Looking upon this line therefore in its most important feature, namely as a strategic and military line, we are strongly in favor of the right bank line.

25. In a commercial point of view, the right bank has many advantages. The country through which the railway passes is better than on the other side. It is probable that in future years a canal may be made which will be sufficient for all the commercial requirements of the left bank, and though the number of miles travelled will be somewhat greater, the cost will be somewhat less, and the great uncertainty of bridging the Indus at Kotree will be avoided.

26. We cannot think that consideration with regard to the approaches of a railway from the Bombay or Ajmere side can enter very seriously into the consideration of this matter at present.

27. With regard to finance, this undertaking is not very promising, and if anything shows the soundness of the decision that was arrived at in reducing the gauge for future long lines of communication in India, it would be the forecast made in these papers; in fact, if our only mode of constructing a line was to be on the scale of the East Indian or even the Delhi and Punjab Railways, from Mooltan to Kotree, the thing under our present circumstances would have been a financial impossibility.

28. The returns of expected traffic are not very reliable, but they are sufficient to show that for the present at all events a narrow gauge line made on the most economical principles cannot be remunerative.

29. If, however, we look upon it in a political light, and if we have only to pay £30,000 or £40,000 a year for building the "missing link," we consider that the money would be exceedingly well spent.

30. We commend all these valuable papers to the consideration of your Grace. We have had no hesitation in ordering that the detailed survey and location of the line on the right bank be commenced and be prosecuted and completed during the ensuing cold season. A copy of our orders accompanies.

31. We beg also to annex a copy of a Minute by our Colleague His Excellency the Commander-in-Chief, of this day's date.

Documents accompanying.

1.—Proceedings, March 1871, Nos. 167—70.
2.—From Bombay, No.——, dated 2nd May 1871.
3.—From ditto, No. 909, dated 1st August 1871.
4.—To Consulting Engineer to Government for Guaranteed Railways, Lahore, No. 2191R., dated 30th October 1871.
5.—Sketch.
6.—Minute by His Excellency the Commander-in-Chief, dated the 31st October 1871.

Minute by His Excellency the Commander-in-Chief, dated 31st October 1871.

I dissent from the 24th and 27th paragraphs. Fully concurring regarding the extreme political value of the Indus Valley line of Railway, I am unable to concur in placing its urgency before the completion of the Lahore and Peshawur line.

Troops could be delivered by steamer on the right bank of the Indus opposite to the Bolan Pass; but there is no alternative to marching from Lahore to Peshawur, and the immediate elements of danger, which might call for military repression, are close to our Peshawur Frontier and a long way from the frontier of Sindh. I am unable to consider the construction of the Indus Valley line on a broad gauge "a financial impossibility" under the present circumstances of India.

NAPIER OF MAGDALA.

GOVERNMENT OF INDIA.

FOREIGN DEPARTMENT.

TREATY WITH ABOO BEKR BIN ABDOOLLA, DATED ADEN, 30th MAY 1871, REGARDING SUPPRESSION OF SLAVE TRADE AND OTHER MATTERS.

The reason of writing this is as follows:—Whereas on the 14th day of October A. D. 1255, answering to the 2nd day of Safor A. H. 1272, a Treaty was entered into between Sooltan Munassar bin Abdallah bin Mehdee, the Oulakee, and Sooltan Boobekr bin Abdallah bin Mehdee, the Oulakee, on the one part, and Brigadier William Marcus Coghlan, Political Resident at Aden on behalf of the British Government, on the other part, for the suppression of the traffic in slaves from Africa; and whereas it is expedient that the friendship which is now existing between these parties should be still further augmented, therefore we whose signatures and seals* are hereunto annexed both ratify the covenant entered into as aforesaid, and further do agree to the conditions hereafter specified, that is to say:—

* *N. B.*—Not affixed.
C. U. AITCHISON.

ARTICLE I.

That there shall be perpetual friendship and peace between us and the British Government, and the Allies thereof.

ARTICLE II.

It is incumbent upon us to keep the roads within our territories, and the seashore thereof, secure and peaceful.

ARTICLE III.

If any ship belonging to the British Government or to the subjects thereof, or to the Government of any other State or to the subjects thereof, shall be wrecked upon our shores, it is incumbent upon us to protect the same, and to render all the assistance in our power to the crews and passengers, and to treat them well.

ARTICLE IV.

It is incumbent upon us to conduct the crews and passengers as aforesaid to Aden in safety, as well as all the property which may belong to them, and it shall be at the discretion of the British Government to recompense us for our trouble as they may deem fit.

ARTICLE V.

If any seaman belonging to a Vessel anchored in the harbour of Aden or in its vicinity, or if any soldier belonging to the garrison of Aden shall desert and take refuge in our territories, it shall be incumbent upon us to convey him in safety to Aden, and to deliver him up to be dealt with as the authorities there may deem fit.

ARTICLE VI.

This engagement is binding on me, my successors and descendants and on all my tribe, and is fully made and entered into on their behalf with the British Government.

Written at Aden, the 30th day of May 1871, answering to the 11th day of Rabiul Aowul A. H. 1288.

W. TREMENHEERE, *Resident.*

ABOO BEKR BIN ABDOOLA.

Ratified by His Excellency the Viceroy and Governor General of India at Calcutta, on the 11th day of December 1871.

C. U. AITCHISON,
Secy. to the Govt. of India.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

TABLES SHOWING AREA, CULTIVATION, &c., &c.

BOMBAY PRESIDENCY.

TABLE I.

Classification of Lands and Crops for the year 1869-70.

Classification of Lands.		Ahmedabad.	Kaira.	Surat.	Broach.	Tanna.	Kulladghee.	Canara.	Rutnagherry.	Satara.	Khandeish.	Sholapoor.	Poona.	Belgaum.	Dharwar.	Nassick.	Ahmednuggur.	Total.
		Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
A.	Total area ...	1,030,781	937,625	992,218	879,836	2,583,333	3,858,561	344,486	1,861,593	3,432,484	6,498,773	2,257,371	3,230,257	2,276,518	2,965,570	3,364,280	4,203,562	40,717,229
A. {B.	Barren ...	178,557	110,524	210,234	228,926	1,489,731	427,995	223,522	927,294	789,550	2,612,158	251,827	741,751	532,919	405,938	920,755	1,008,333	11,060,014
{C.	Residue cultivable ...	862,224	827,101	781,984	650,910	1,093,593	3,430,566	120,964	934,299	2,642,934	3,886,615	2,005,644	2,488,506	1,743,599	2,559,632	2,443,524	3,195,219	29,657,215
C. {D.	Jagheer or not paying revenue ...	245,552	346,284	90,589	178,826	63,670	1,355,379	79	44,493	887,684	402,760	190,720	615,124	539,228	870,777	201,234	641,136	6,673,535
{E.	Cultivable not cultivated ...	86,403	89,164	97,863	52,497	66,170	131,153	28,045	162,266	204,431	1,126,378	14,412	50,460	25,870	126,752	530,806	105,498	2,898,168
{F.	Fallows of one year ...	29,286	17,415	219,153	27,816	430,849	1,937	14,881	309,459	92,428	93,694	70,972	167,519	81,063	...	116,819	190,871	1,864,152
{G.	Crops of one year ... {Rubbee..	152,831	24,395	73,111	149,334	190,545	774,225	1,183	1,777	268,034	285,046	1,057,708	650,695	163,966	710,061	300,566	990,926	5,794,403
	{Khurreef	332,312	349,842	301,287	242,436	336,441	1,167,735	76,776	416,303	1,190,356	1,978,746	671,730	1,004,708	920,725	852,040	1,294,099	1,266,784	12,402,300
	Two first crops ...	5,840	...	...	...	5,961	...	...	...	...	...	...	...	12,746	...	90	...	24,657
	TOTAL ...	490,963	374,237	374,379	391,770	532,967	1,941,960	77,959	418,080	1,458,391	2,263,792	1,729,438	1,655,403	1,097,437	1,562,102	1,594,755	2,257,710	18,221,360
H.	Baranee or not irrigated... {Rubbee..	142,929	12,687	71,271	148,749	196,526	770,467	...	306	256,420	273,825	1,037,248	674,206	169,801	709,562	321,346	...	4,785,293
	{Khurreef	323,658	321,130	265,328	240,282	342,422	1,157,783	76,756	390,796	1,139,541	1,959,556	662,959	962,452	921,268	847,803	1,242,623	...	10,854,351
	Deduct area cropped in both Fusls ...	418	687	...	...	6,961	...	...	...	13,384	...	...	...	5,834	...	...	...	26,304
	TOTAL ...	466,169	333,130	336,543	389,080	532,967	1,928,250	76,756	391,102	1,382,577	2,233,381	1,700,207	1,636,658	1,085,235	1,557,366	1,563,969	2,219,510	17,832,850
I. {G	Canal irrigated by lift ... {Rubbee..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6,281	...	6,281
	{Khurreef	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10,205	...	10,205
	* TOTAL ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16,486	...	16,486

K

TABLE I—*continued.*

Classification of Lands and Crops for the year 1869-70—continued.

	Classification of Lands.		Ahmedabad.	Kaira.	Surat.	Broach.	Tanna.	Kulladghee.	Canara.	Rutnagherry.	Sattara.	Khandeish.	Sholapoor.	Poona.	Belgaum.	Dharwar.	Nassick.	Ahmednuggur.	TOTAL.
			Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
G—*continued.*	I. Canal irrigated by flow ...	Rubbee..	...	...	...	...	...	...	...	...	...	...	...	...	...	403	4,211	...	4,614
		Khurreef	...	...	...	...	...	...	...	...	...	...	...	...	...	1,336	6,519	...	7,855
		TOTAL ...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,739	10,730	...	12,469
	Total Canal irrigated ...	Rubbee..	...	385	...	...	...	...	251	...	353	5,229	...	3,115	...	403	10,492	...	20,228
		Khurreef	...	5,114	...	...	...	...	18	...	710	4,162	...	6,699	...	1,336	16,724	...	34,763
		TOTAL ...	...	5,499	...	...	...	...	269	...	1,063	9,391	...	9,814	...	1,739	27,216	...	54,991
	J. Irrigated from other sources	Rubbee..	15,855	13,535	1,890	586	...	3,758	1,160	1,471	31,849	5,992	24,235	8,532	6,911	95	9,531	...	125,400
		Khurreef	14,380	25,096	35,945	2,154	...	9,951	2	25,507	67,175	15,028	30,123	19,707	12,202	2,901	15,230	...	275,401
		TOTAL ...	30,235	38,631	37,836	2,740	...	13,709	1,162	26,978	99,024	21,020	54,358	28,239	19,113	2,997	24,761	...	400,801
	J. & J. Total irrigated ...	Rubbee..	15,855	13,921	1,890	586	...	3,758	1,412	1,471	32,202	11,221	24,235	11,647	6,911	498	20,024	...	145,631
		Khurreef	14,380	30,210	35,945	2,154	...	9,951	20	25,507	67,885	19,190	30,123	26,406	12,202	4,238	31,955	...	310,166
		TOTAL ...	30,235	44,131	37,836	2,740	...	13,709	1,432	26,978	100,087	30,412	54,358	38,053	19,113	4,736	51,979	38,200	493,997
	Deduct area cropped in both Fusls ...		5,421	3,024	...	...	...	...	229	...	24,273	...	25,128	19,307	6,911	...	14,992	...	99,285
	Net area irrigated		24,814	41,107	37,836	2,740	...	13,709	1,203	26,978	75,813	30,412	29,230	18,746	12,202	4,736	36,987	38,200	394,713
	Population	Town ...	232,791	117,158	139,406	*44,600	...	187,140	14,317	91,760	42,103	74,823	51,648	93,988	84,802	143,811	58,389	84,488	1,161,221
		Rural ...	407,962	559,408	397,007	*112,400	...	512,876	57,724	724,115	912,135	752,667	505,477	659,855	726,047	759,661	515,694	600,443	8,203,471
		TOTAL ...	640,753	676,566	536,417	*157,000	609,950	700,016	72,041	815,875	954,238	827,490	557,125	753,843	810,849	903,472	574,083	684,931	10,274,645

* These figures are taken from Tables for 1868-69.

C. J. MERRIMAN, *Lieut.-Col., R. E.,*
Acting Chief Engineer for Irrigation.

TABLE II.

Distribution of Chief Crops in Acres for the year 1869-70.

	Crops.	Ahmedabad.	Kaira.	Broach.	Surat.	Tanna.	Ahmednuggur.	Belgaum.	Dharwar.	Poona.	Sholapoor.	Kulladghee.	Rutnagherry.	Sattara.	Canara.	Khandeish.	Nassick.	TOTAL.
KHURREEF.	Rice	31,347	51,830	32,351	86,694	336,440	7,093	66,446	86,664	32,986	17,412	7,332	113,296	21,089	...	15,788	28,746	935,514
	Cotton	...	4,187	154,100	54,003	...	21,041	140,204	...	38,004	110,336	175,091	...	52,289	...	491,595	5,455	1,246,305
	Jowar and Bajree	236,708	223,080	33,184	76,539	...	1,057,372	420,056	409,957	687,308	412,110	878,053	...	883,330	...	1,074,750	795,736	7,188,183
	Till (Oil-seeds)	10,802	1,044	764	363	...	...	1,630	16,467	25,848	38,479	2,107	...	...	...	112,351	114,842	354,697
	Others	16,580	69,691	22,035	76,705	...	181,278	292,388	286,096	200,393	106,518	83,856	285,762	402,974	76,776	246,969	349,481	2,697,502
	Pulse	36,875	...	...	2,492	...	...	...	46,540	...	...	18,821	...	...	...	...	...	104,728
	TOTAL ...	332,312	349,832	242,435	296,796	336,440	1,266,784	920,725	845,725	984,539	684,855	1,165,260	399,058	1,359,682	76,776	1,971,153	1,294,260	12,526,929
RUBBEE.	Jowar	...	...	64,638	...	34	697,687	...	56,706	363,841	877,767	227,828	...	...	...	...	...	2,288,504
	Wheat and Barley	72,177	8,936	47,620	28,144	...	128,868	37,142	118,551	65,146	25,667	61,372	...	35,396	...	148,956	190,946	971,924
	Pulse	...	2	...	9,009	...	...	8,309	21,202	62,056	69,720	20,094	...	...	...	...	58,687	249,079
	Oil-seeds	...	1,943	9,260	28,171	2,978	...	17,606	34,089	48,860	29,301	34,143	...	1,080	...	26,770	10,188	244,989
	Others	1,526	13,512	27,814	1,322	187,533	164,371	100,908	78,023	112,086	39,338	215,875	1,776	44,503	1,183	109,320	42,034	1,141,124
	Cotton	79,128	...	...	...	...	...	...	400,522	...	...	211,420	...	...	...	...	...	691,070
	TOTAL ...	152,831	24,394	149,334	66,646	190,545	990,926	163,966	709,093	651,992	1,041,793	773,731	1,776	80,979	1,183	285,046	301,855	5,586,690
TWO FIRST CROPS.	Sugar	2,697	1,055	...	8,216	1,631	...	5,306	3,457	3,289	1,439	1,226	...	13,376	...	2,120	609	44,421
	Vegetables	3,143	360	...	2,422	869	...	5,492	1,443	9,564	950	620	...	4,352	...	5,051	2,925	37,191
	Fruit trees	...	14	...	111	3,385	...	1,947	1,780	6,020	399	1,121	17,245	...	...	120	1,304	33,446
	Others	...	2,281	...	188	95	...	...	...	...	...	...	...	...	...	...	...	2,564
	TOTAL ...	5,840	3,710	...	10,937	5,981	...	12,746	6,681	18,873	2,788	2,967	17,245	17,729	...	7,292	4,838	117,622
	GRAND TOTAL ...	490,983	377,947	391,770	374,379	532,967	2,257,710	1,097,437	1,562,102	1,655,404	1,729,437	1,941,960	418,080	1,458,390	77,959	2,263,792	1,600,955	18,231,272

C. J. MERRIMAN, *Lieut.-Col., R. E.,*
Acting Chief Engineer for Irrigation.

TABLE III.

Weight of Produce in Maunds of 82 *Pounds for the year* 1869-70.

Nature of Produce.	Total. Area.	Total. Weight.	Ahmedabad.	Kaira.	Khandeish.	Surat.	Broach.	Tanna.	Ahmednuggur.	Belgaum.	Dharwar.	Poona.	Sholapoor.	Kullaghee.	Ruthnagherry.	Sattara.	Nassick.
	Acres.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.	Maunds.
Rice ...	935,514	19,308,677	401,597	542,119	126,116	1,682,283	294,561	3,578,790	30,275	700,893	982,445	346,138	176,784	20,951	10,110,964	144,356	170,405
Cotton ...	1,937,375	3,264,464	631,612	23,778	400,848	294,147	418,521	...	7,697	210,842	585,601	38,911	238,732	345,274	...	58,654	9,849
Jowar and Bajree ...	9,476,687	44,567,600	1,154,869	1,441,782	5,780,665	624,192	558,579	320	4,925,370	9,336,442	2,272,407	2,489,014	2,292,810	3,709,690	...	3,010,322	6,961,118
Oil Seeds ...	599,686	2,007,752	56,515	3,656	523,180	118,436	49,564	26,134	...	43,143	82,544	148,913	634,669	30,765	...	1,475	288,768
Wheat and Barley ...	971,924	6,399,477	407,923	68,788	715,653	109,934	242,252	440	235,734	2,962	188,531	239,085	580,648	128,977	...	123,475	3,855,075
Pulse ...	353,907	2,226,973	178,485	3,235	...	46,223	...	...	...	34,124	134,081	200,660	986,763	45,093	...	...	589,309
Others ...	3,878,320	24,772,288	382,140	1,098,252	945,808	1,199,458	317,583	1,309,138	818,572	1,076,446	703,954	571,376	864,604	146,960	11,264,648	2,424,239	1,548,031
Total ...	*18,153,313	102,936,155	3,213,161	3,181,610	8,492,270	4,074,673	1,881,060	4,914,812	6,017,648	11,404,854	4,949,562	4,043,097	5,775,010	4,427,710	21,375,612	5,762,521	13,422,555

* The difference between this and the figures given in tables I and II as total crop, is owing to the information regarding Canara not having been furnished for this table.

C. J. MERRIMAN, *Lieut.-Col, R. E.,*
Acting Chief Engineer for Irrigation.

TABLE IV.

Distribution of Produce in Maunds of 82 *Pounds for the year* 1868-69.

Exports.	Rice.	Cotton.	Oil-seed.	Jowar and Bajree.	Wheat and Barley.	Pulse.	Other Crops.	Total.
Ahmedabad ...	2,101	546,950	7,370	71,477	97,112	24,752	17,839	767,601
Kaira ...	152,800	9,500	...	283,992	...	...	127,051	573,343
Khandeish ...	400	329,250	176,277	350,910	161,778	...	105,803	1,124,418
Surat ...	709,078	271,106	54,609	99,585	61,245	5,990	387,786	1,589,399
Broach ...	...	323,451	...	15,702	73,501	...	15,000	427,654
Tanna ...	1,328,800	...	4,556	...	...	...	309,865	1,643,221
Ahmednuggur ...	11,355	2,887	...	1,740,660	103,134	...	309,098	2,167,134
Belgaum ...	325,996	174,921	14,087	615,487	448	8,474	254,121	1,393,536
Dharwar ...	397,067	522,885	4,264	161,897	16,467	1,036	73,180	1,176,799
Poona ...	66,318	38,128	18,499	390,893	67,164	28,248	14,102	623,353
Sholapoor ...	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.
Kulladghee ...	7,114	211,566	3,686	757,562	35,190	8,771	30,681	1,054,571
Rutnagherry ...	36,097	...	...	...	...	...	119,343	155,440
Sattara ...	707	18,594	...	282,544	877	...	811,521	1,114,243
Canara ...	...	...	...	...	...	...	...	...
Nassick ...	71,845	...	106,890	2,649,646	1,860,321	224,525	370,629	5,283,796
Total ...	3,109,678	2,449,238	390,178	7,420,355	2,477,237	301,796	2,946,019	19,694,508

Kept for Consumption.

Ahmedabad ...	399,496	84,662	49,145	1,083,412	300,811	153,733	374,301	2,445,560
Kaira ...	389,319	14,278	12,892	1,157,790	68,788	3,235	961,965	2,608,267
Khandeish ...	125,716	71,598	279,262	5,429,753	553,874	...	907,648	7,367,851
Surat ...	973,205	23,041	63,827	524,607	48,689	40,233	811,672	2,485,274
Broach ...	294,561	95,070	49,564	542,877	168,751	...	302,492	1,453,406
Tanna ...	2,249,989	...	21,568	420	440	...	999,173	3,271,590
Ahmednuggur ...	18,920	4,810	...	3,184,710	132,600	...	509,474	3,850,514
Belgaum ...	374,896	35,920	9,056	8,720,954	2,513	25,650	822,325	10,011,317
Dharwar ...	585,378	62,715	78,280	2,110,509	172,063	133,044	630,773	3,772,763
Poona ...	279,819	782	130,414	2,098,121	171,920	181,412	557,274	3,419,743
Kulladghee ...	13,837	133,708	27,078	2,952,128	93,786	36,381	116,280	3,373,200
Sholapoor ...	176,784	238,732	634,669	2,292,810	580,648	986,763	864,604	5,775,010
Rutnagherry ...	10,074,866	...	...	...	...	...	11,145,312	21,220,178
Sattara ...	143,648	40,060	1,475	2,727,777	122,598	...	1,612,720	4,648,278
Canara ...	...	...	...	...	...	...	...	...
Nassick ...	98,560	9,849	181,938	4,311,472	1,994,754	364,884	1,177,302	8,138,759
Total ...	16,198,994	815,225	559,168	37,137,340	4,412,235	1,925,335	21,793,315	83,841,710

C. J. MERRIMAN, *Lieut.-Col., R. E.,*
Acting Chief Engineer for Irrigation.

TABLE V.

Showing Area and Population of different Collectorates.

Collectorates.	Area.		Population.		Remarks.
	Total.	Crops.	Town.	Rural.	
Ahmedabad ...	1,030,781	490,983	232,791	407,962	
Kaira ..	937,625	374,237	117,158	559,408	
Surat ...	992,218	374,379	139,406	397,007	
Broach ...	879,836	391,770	44,600	112,400	
Tanna ...	2,583,333	532,967	...	...	
Kulladghee ...	3,858,561	1,941,960	187,140	512,876	
Canara ...	344,486	77,959	14,317	57,724	
Rutnagherry ...	1,861,593	418,080	91,760	724,115	
Sattara ...	3,432,484	1,458,391	42,103	912,135	
Khandeish ...	6,498,773	1,263,792	74,823	752,667	
Sholapoor ...	2,257,371	1,729,438	51,648	505,477	
Poona ...	3,230,257	1,655,403	93,988	659,855	
Belgaum ...	2,276,518	1,097,437	84,802	726,047	
Dharwar ...	2,965,570	1,562,102	143,811	759,661	
Nassick ...	3,364,280	1,594,755	58,389	515,694	
Ahmednuggur...	4,203,552	2,257,710	84,488	600,443	
Total ...	40,717,229	18,221,360	1,461,221	8,203,471	
	63,620	286 Acres	23	129	
	Sq. Miles.	Per Sq. Mile.	Per Sq. Mile.	Per Sq. Mile.	

C. J. MERRIMAN, *Lieut.-Col., R. E.,*
Acting Chief Engineer for Irrigation.

MADRAS PRESIDENCY.

TABLE I.

Classification of Lands and Crops for Fusly 1279 (1869-70).

Classification of lands.	Ganjam.	Vizagapatam.	Godavery.	Kistna.	Nellore.	Cuddapah.	Bellary.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
A. Total area	2,248,320	3,381,760	3,971,840	4,504,960	5,173,760	5,306,240	6,948,480
A. Government land { B. Barren (Porumboke) ...	787,200	2,000,240	2,213,760	1,146,880	1,219,840	1,840,388	642,778
A. Government land { C. Residue culturable ...	454,974	87,106	1,241,662	2,643,899	1,529,325	3,465,852	6,305,702
Other land ... Consists of Zemindaris, Forests, Hill Tracts ...	1,006,146	1,004,414	516,418	714,181	2,424,595	...	...
D. Jaghire or not paying full revenue (minor Inams) ...	114,584	...	355,170	576,613	278,396	671,422	1,429,279
C. E. Culturable not cultivated ...	51,372	6,668	179,291	300,847	325,218	1,482,834	2,439,522
C. F. Fallow (occupied waste in the Fusly 1279) ...	1,762	6,456	215,219	182,246	187,392	68,685	162,690
G. Under actual cultivation ...	287,256	73,982	491,982	1,584,193	793,319	1,242,911	2,274,211
G. H. Baranee or dry or unirrigated ...	107,847	60,179	266,950	1,439,602	616,392	1,148,122	2,129,222
G. I. Canal irrigated	Cannot be given.						
G. J. Irrigated otherwise			225,032	144,591	176,927	94,789	144,989
I. and J. Total irrigated	179,409	23,803					
Deduct area cropped in both Fuslies ...	...	...	...	...	...	...	...
Net area irrigated	179,409	23,803	225,032	144,591	176,927	94,789	144,989
Population as per Census of 1867 ... {Town	64,130	110,138	203,247	139,385	54,688	99,640	149,196
Population as per Census of 1867 ... {Rural	1,171,660	1,824,420	1,224,225	1,157,267	1,113,976	1,045,119	1,155,802
Total ...	1,235,790	1,934,558	1,427,472	1,296,652	1,168,664	1,144,759	1,304,998

TABLE I — *continued.*

Classification of Lands and Crops for Fusly 1279 (1869-70) —continued.

Classification of lands.		Kurnool.	Chingleput.	North Arcot.	South Arcot.	Tanjore.	Trichinopoly.	Madura.
		Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
A. Total area		5,011,200	1,925,760	4,576,000	3,118,080	3,248,640	1,945,600	5,186,560
A. Government land	B. Barren (Porumboke) ...	1,781,993	300,800	1,230,080	933,760	664,960	599,040	...
	C. Residue culturable ...	3,229,207	957,158	1,155,160	1,839,095	1,725,717	1,313,561	1,402,292
Other land ...	Consists of Zemindaris, Forests, Hill Tracts ...	...	667,802	2,190,760	345,225	857,963	32,999	3,784,268
C. D. Jaghire or not paying full revenue (minor Inams) ...		1,003,160	53,758	130,299	100,638	564,910	84,614	97,487
C. E. Culturable not cultivated		1,043,879	388,106	344,049	508,207	142,487	182,962	418,623
C. F. Fallow (occupied waste in the Fusly 1279) ...		35,065	143,739	99,257	101,622	81,935	91,329	87,892
C. G. Under actual cultivation		1,147,103	371,555	581,555	1,128,628	936,385	954,656	798,290
G. H. Baranee or dry or unirrigated		1,121,011	167,987	407,882	870,627	238,243	825,494	664,913
G. I. Canal irrigated		Cannot be given.						
G. J. Irrigated otherwise								
G. I. and J. Total irrigated		26,092	203,568	173,673	258,001	698,142	129,162	133,377
Deduct area cropped in both Fuslies		...	...	...	...	...	...	...
Net area irrigated		26,092	203,568	173,673	258,001	698,142	129,162	133,377
Population as per Census of 1867 ...	Town ...	39,264	127,557	119,602	127,178	219,345	28,285	172,608
	Rural ...	731,593	676,726	1,667,532	1,134,668	1,512,274	978,541	1,773,781
	TOTAL ...	770,857	804,283	1,787,134	1,261,846	1,731,619	1,006,826	1,946,389

TABLE I—*concluded.*

Classification of Lands and Crops for Fusly 1279 (1869-70) —concluded.

Classification of lands.		Tinnevelly.	Coimbatore.	Neilgherries.	Salem.	South Canara.	Malabar.	TOTAL.
		Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
A. Total area		3,342,080	4,992,000	272,640	4,554,880	...	3,735,040	73,443,840
A. Government land ...	B. Barren (Porumboke) ...	471,680	1,701,214	200,436	289,920	Cannot be given, the district being unsurveyed.	...	18,114,969
	C. Residue culturable ...	1,510,378	3,290,786	72,204	1,420,478		790,286	34,434,842
Other land ...	Consists of Zemindaris, Forests, Hill Tracts	1,360,022	...	...	2,844,482		2,944,754	20,894,029
C. D. Jaghire or not paying full revenue (minor Inams)		66,708	304,117	1,584	60,497		9,426	5,897,662
C. E. Culturable not cultivated		148,699	740,940	11,152	208,946		...	8,923,802
C. F. Fallow (occupied waste in the Fusly 1279) ...		289,297	304,332	14,905	20,750		5,304	2,049,877
C. G. Under actual cultivation		1,005,674	1,941,397	44,563	1,130,285		775,556	17,563,501
G. H. Baranee or dry or unirrigated		846,019	1,860,526	44,523	1,066,628		391,317	14,263,484
G. I. Canal irrigated		Cannot be given.						
G. J. Irrigated otherwise								
G. I. and J. Total irrigated		159,655	80,871	40	63,657		384,239	3,300,017
Deduct area cropped in both Fuslies		...	...	...	...	...	...	...
Net area irrigated		159,655	80,871	40	63,657	...	384,239	3,300,017
Population as per Census of 1867 ...	Town	354,083	84,586	25,406	107,041	35,801	134,740	2,395,920
	Rural	1,167,085	1,308,010	12,736	1,512,192	803,887	1,721,638	23,693,132
	TOTAL ...	1,521,168	1,392,596	38,142	1,619,233	839,688	1,856,378	26,089,052

Abstract of Area in Acres.

	Rubbee Khurreef.	TOTAL.
	Acres.	Acres.
Baranee or dry	14,263,484	14,263,484
Canal and other irrigation or wet ...	3,300,017	3,300,017
Total Crop ...	17,563,501	17,563,501
Fallow	...	2,049,877
TOTAL ...	...	19,613,378

TABLE II.

Distribution of Chief Crops in Acres for Fusly 1279 (1869-70).

Crop.	Ganjam.	Vizagapatam.	Godavery.	Kistna.	Nellore.	Cuddapah.	Bellary.	Kurnool.	Chingleput.	North Arcot.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Rice	202,601	25,367	300,636	233,416	177,210	84,401	118,448	33,043	233,075	153,649
Raggy	58,581	7,979	11,268	17,970	36,927	99,477	83,067	13,337	30,816	87,096
Cholum or Jowari	522	1,294	38,797	437,131	273,596	254,619	783,224	459,529	14,314	46,659
Cumboo or Bajira	4,799	16,232	6,976	126,997	44,905	294,405	184,654	56,103	9,360	124,194
Other food grains	4,082	9,620	65,771	251,491	139,772	193,624	519,094	323,676	55,769	103,031
Oil-seeds	14,652	17,916	73,182	67,003	34,033	46,582	77,501	34,097	5,492	34,966
Sugar	1,893	441	1,528	...	3	1,764	6,471	555	20	1,680
Cotton	4,639	3,649	39,441	199,183	11,841	66,851	328,427	157,019	15	846
Opium	...	...	...	...	...	...	...	...	...	...
Indigo	30	29	931	25,259	33,949	38,425	7,401	33,852	8,149	8,763
Fibres	...	...	11,752	492	...	13	184	...	...	...
Tobacco	1,029	1,093	3,111	20,254	2,206	642	...	4,599	...	673
Tea	...	...	...	...	...	...	...	...	...	...
Coffee	...	...	...	...	...	...	...	...	...	...
Vegetables	691	585	9,497	24,870	3,494	2,234	8,341	879	1,626	2,911
Other crops	12,721	7,738	14,861	78,650	42,365	159,874	210,263	44,070	25,705	52,442
Total ...	306,240	91,943	577,751	1,482,717	800,301	1,242,911	2,327,075	1,160,759	384,341	616,910
Deduct land twice cropped ...	18,984	17,961	85,769	*...	6,982	...	52,864	13,656	12,786	35,355
Remainder ...	287,256	73,982	491,982	1,584,193	793,319	1,242,911	2,274,211	1,147,103	371,555	581,555

* There must be some error in the Kistna returns which will be rectified next year.

TABLE II—*continued.*

Distribution of Chief Crops in Acres for Fusly 1279 (1869-70)—continued.

Crop.	South Arcot.	Tanjore.	Trichinopoly.	Madura.	Tinnevelly.	Coimbatore.	Neilgherries.	Salem.	South Canara.	Malabar.	Total.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Rice	289,895	743,557	162,770	123,462	208,220	81,616	...	79,398	...	579,432	3,830,196
Raggy	134,957	30,582	108,978	81,625	45,246	196,944	2,377	331,567	...	4,086	1,375,880
Cholum or Jowari ...	96,819	11,072	174,506	181,339	70,872	558,188	...	62,398	...	...	3,464,880
Cumbum or Bajira ...	233,535	39,327	156,949	87,128	163,819	696,366	...	417,334	...	...	2,663,083
Other food grains ...	284,953	95,042	296,467	206,041	234,059	203,019	32,941	384,514	...	686	3,410,652
Oil-seeds	60,223	17,810	30,999	25,056	...	19,588	...	86,740	...	29,357	675,197
Sugar	1,597	292	1,733	166	133	1,737	...	2,613	...	...	22,626
Cotton	44,099	3,153	5,580	42,890	164,050	141,083	...	18,375	...	...	1,231,141
Opium	...	...	...	...	...	...	63	...	...	...	63
Indigo	44,187	1,329	345	53	487	...	...	2,648	...	...	205,837
Fibres	74	...	409	10	487	740	...	387	...	...	14,548
Tobacco	2,526	...	1,005	3,436	1,351	18,220	...	3,899	...	...	64,044
Tea	...	...	...	...	...	...	954	...	...	...	954
Coffee	...	...	...	292	1,875	172	7,464	...	..	27,143	36,946
Vegetable	4,495	3,383	13,128	4,645	12,923	19,772	956	7,290	...	...	121,720
Other crops	44,433	22,314	56,923	54,331	183,761	224,004	1,607	122,542	...	246,672	1,605,276
Total ...	1,241,793	967,861	1,009,792	810,474	1,087,283	2,161,449	46,362	1,519,705	...	887,376	18,723,043
Deduct land twice cropped...	113,165	31,476	55,136	12,184	81,609	220,052	1,799	389,420	...	111,820	*1,261,018
Remainder ...	1,128,628	936,385	954,656	798,290	1,005,674	1,941,397	44,563	1,130,285	...	775,556	17,563,501

* The disagreement between the total, *minus* "land twice cropped," and the remainder, is due to the error in the Kistna District return already alluded to in the foot-note.

TABLE IV.

Export by Sea of Produce in Indian Maunds of 82 *pounds during* 1869-70.

Districts.	Cotton.	Rice.	Paddy.	Wheat.	Other Grains.	Oil-seeds.	Total.
	In. Mds.	In. Mds.	In. Mds.	In. Mds.	In. Mds.	In. Mds.	In. Mds.
Fort St. George ...	319,598	28,203	2,945	313	37,230	36,495	424,784
Ganjam ...	...	174,747	...	...	152	133,998	308,897
Vizagapatam ...	...	3,516	...	...	1,703	345,338	350;557
Godavery ...	137,078	66,880	14,541	...	65,444	506,756	790,699
Kistna ...	26,747	4	...	...	9,884	121,805	158,390
Nellore ...	...	...	...	..	...	10,305	10,305
South Arcot ...	...	11,357	105,272	...	104	178	116,911
Tanjore ...	...	1,300,906	142,964	393	56,093	1,033	1,501,389
Madura ..	...	9,230	27,332	...	8,143	...	44,705
Tinnevelly ...	339,614	206	...	...	13,525	1,086	354,431
South Canara ...	83	356,791	44,127	523	6,377	966	408,867
Malabar ...	13,631	70,055	153	13,085	49,219	8,852	154,995
TOTAL ...	836,751	2,021,895	337,334	14,314	247,824	1,166,812	4,624,930

TABLE VI.

Area and Population of Districts from Madras to Beypore on the South-West Line of Madras Railway.

Districts.	Total Area.	Cultivated Area.	Population.	
			Town.	Rural.
	Acres	Acres.	No.	No.
Chingleput ...	1,925,760	371,555	127,557	676,726
North Arcot ...	4,576,000	581,555	119,602	1,667,532
Salem ...	4,554,880	1,130,285	107,041	1,512,192
Coimbatore ...	4,992,000	1,941,397	84,586	1,308,010
Malabar ...	3,735,040	775,556	134,740	1,721,638
TOTAL ...	19,783,680	4,800,348	573,526	6,886,098
		North-West Line.		
North Arcot ...	4,576,000	581,555	119,602	1,667,532
Cuddapah ...	5,306,240	1,242,911	99,640	1,045,119
Bellary ...	6,948,480	2,274,211	149,196	1,155,802
TOTAL ...	16,830,720	4,098,677	368,438	3,868,453
		The Great Southern of India Railway.		
Coimbatore ...	4,992,000	1,941,397	84,586	1,308,010
Trichinopoly ...	1,945,600	954,656	28,285	978,541
Tanjore ...	3,248,640	936,885	219,345	1,512,274
TOTAL ...	10,186,240	3,832,438	332,216	3,798,825
		Bangalore Branch Line.		
Salem ...	4,554,880	1,130,285	107,041	1,512,192
Mysore Territory... Bangalore ...	*1,655,040	*901,760	*659,408	
Mysore Territory... Kolar ...	*1,460,160	*661,760	*479,248	
TOTAL ...	7,670,080	2,693,805	...	...
		Carnatic Railway to Conjeveram.		
North Arcot ...	4,576,000	581,555	119,602	1,667,532
Chingleput ...	1,925,760	371,555	127,557	676,726
TOTAL ...	6,501,760	953,110	247,159	2,344,258

* Taken from the Administration Report of Mysore for the year 1869-70.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

REPORT ON THE STATE OF THE SEASON AND PROSPECTS OF THE CROPS IN RAJPOOTANA.

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
RAJPOOTANA	Sirohee ...	December 9 ...	0·24	December 22 ...	Tanks dry; wells very low; rubbee prospects improved.	A fair rubbee crop is now expected in Meywar in consequence of the late rains.
	Meywar ...	.....	1·95	.....	Weather cloudy; small tanks considerably filled; rubbee prospects fair, and with continuance of showery weather, will be much better.	
	Marwar ...	.....	...	.....	Rain, and prospects improved.	
	Deolee ...	.....	...	.....	Prospects good.	Prospects in Serohee, Marwar, and Mhairwarra have improved, but are still bad.
	Kota ...	.....	...	.....	Rubbee sowings completed; prospects fair.	
	Jhullawar ...	December 9 ...	*Nil.*	.....	Tanks and wells as usual; rubbee prospects good.	
	Bhurtpore ...	December 20 ...	0·10	.....	Weather cloudy; tanks fairly filled, except in Upper Mhairwarra. Owing to the operations going on, prospects have improved. Belief works to meet distress in Mhairwarra are under organization.	
	Jeypore ...	.....	0·04	.....		
	Ajmere and Mhairwarra...	.....		.....		

Note.—The above was received too late for insertion in the Supplement of the 23rd instant.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

TRANSFER OF MILITARY PUBLIC WORKS AND BARRACK MASTERS' WORK TO THE CONTROL OF INSPECTOR GENERAL OF MILITARY WORKS.

Nos. 1485—93 B—M, dated 15th November 1871.

RESOLUTION—By the Government of India, PUBLIC WORKS DEPARTMENT.

Read the following papers:—

Regarding the failure of the Protestant Church at Jubbulpoor.	P. W. Dept. Proceedings, Military, July	1869,	Nos.	41—49.
Ditto ditto new artillery barracks at ditto	Ditto ditto, October	1870,	Nos.	84—107.
Ditto ditto Gun-carriage Agency and other buildings at Allahabad.	Ditto ditto, January	1871,	„	126—153.
Ditto ditto tannery buildings at Cawnpoor	Ditto ditto, March	„	„	32 & 33.
	Ditto ditto, June	„	„	6—9.
Ditto ditto new British Infantry barracks at Nusseerabad.	Ditto ditto, July	„	„	1—5.
Ditto ditto British Infantry barrack on Ross Island, Port Blair.	Ditto ditto, May	„	No.	54.
	Ditto ditto, January	„	Nos.	88—93.
Ditto ditto British Infantry barracks at Saugor	Ditto ditto, October	„	„	65—100.
Regarding the proposed location of a greater number of troops in the hills, and the extent of accommodation existing in the plains.	Ditto ditto, February	1870	„	95—97.
	Ditto ditto, January	1871	„	44—49.
	Ditto ditto, March	„	„	46 & 47.
Regarding the re-organization of the Barrack Department.	Ditto ditto, January	1865,	„	17 & 18.
	Ditto ditto, Nov.	1869,	No.	13, Part B.

RESOLUTION.—The Governor General in Council has lately had under consideration several circumstances which render it desirable to reconsider the system under which the construction and repairs of military works within the presidency of Bengal is now administered.

2. In the first place several discreditable failures in the construction of the new barracks have taken place. His Excellency in Council is disposed to believe that had the design and construction of these works been entrusted to a selected staff of experienced engineers, these failures would not have occurred. With the extensive operations undertaken in 1864-65, and since carried out more or less to completion, it would hardly have been possible, or at least there would no doubt have been difficulty, in carrying on works only by means of selected officers. But now that the press of work is done, His Excellency in Council believes that such a selection can and ought to be made in view to the construction of the few important military projects which remain.

3. The recent investigations that were made as to the extent of existing barrack accommodation in the plains, and the determination of the Government to place an additional number of European regiments in the hills, have led His Excellency in Council to believe that it will not be necessary to commence any new barracks in the plains upon the standard plan. Thus, as the erection of new buildings is not contemplated, the labors of the Public Works Department in regard to building in the plains will, for the present, be devoted to the completion of those works already in progress, and to their subsidiary buildings.

4. It is considered undesirable that a number of first-class military works should be carried on in different parts of the country at one and the same time. Rapidity of work has not been secured by this system, and it is considered better to place a full and highly qualified staff in superintendence of a few important military works, press them rapidly to completion, and then transfer the staff to whatever undertaking may stand next in order of importance.

5. The remaining military projects occur under several different local administrations. It will be convenient, therefore, that the whole of the staff employed on such projects should be under one authority.

6. The organization of the Barrack Department has lately undergone consideration, and it has been agreed in both the Military and Public Works Departments that the latter department should again undertake the work, so far as it cannot be done by the Commissariat Department, and that it should be done under the orders of the Executive Engineers at Military stations. It seems desirable for many reasons that this duty should, like that of the other supply departments of the army, be under the Government of India.

7. Further, it has been found that inconvenience arises in the working of the grant for military works allotted between the several local administrations, which would be removed if the whole was placed under the entire control of one central authority.

8. The recent allotments to the several local administrations of provincial funds for public works, the provincial cesses raised in some of these administrations for increasing those funds, and the amalgamation that has in some cases taken place of the controlling staff of provincial and local works, all tend to throw more work on the provincial public works administration, and point to the convenience of relieving those administrations from the control of the military works in which they are less interested.

9. It appears, therefore, that it will be proper now to arrange to place the whole of the Public Works and Barrack Masters' work of the stations occupied by European troops of the Bengal Presidency under the control of the Inspector General of Military Works as Chief Engineer and Chief Barrack Master. The Inspector General will thus have the executive control of the barracks and military works generally, and, though attached to the Secretariat of the Public Works Department, and in close communication with the Military Department, will be employed mainly in the executive control and inspection of the works.

10. The existing executive establishments of the military stations should be transferred by the local administrations to this new branch of the department as soon as arrangements can be made, and a proper number of the Superintending Engineers will be transferred also.

11. From the officers thus transferred the Inspector General of Military Works will select a Superintending Engineer and a small select staff of Executive and Assistant Engineers and subordinates to form the constructive corps, who will be entirely relieved from the details of petty works, repairs, and barrack masters' duties, and will be specially charged with the large military projects now in hand.

12. This resolution is not to affect any of the stations occupied by troops of the Madras and Bombay Presidencies.

13. In regard to small stations and stations occupied only by Native troops no change will take place, except when they are in such proximity to the larger military stations as to make it suitable to place the smaller stations under the same Executive Engineer who holds charge of the neighbouring large stations.

14. The several local Governments and administrations concerned will be requested to place their Chief Engineers in communication with the Inspector General of Military Works in order to the transfer of the establishments on the principles above indicated. The transfer will be carried out as soon as the arrangements in each case have been made and sanctioned.

15. The audit of accounts will remain under the local Controllers until the close of the current official year.

16. The Accountant General of the Public Works Department will be desired to submit proposals for taking up the audit of the military works and barrack charges in his own office from the 1st April 1872.

ORDER.—Ordered, that this resolution be communicated to the local Governments and adiministrations noted on the margin for information and guidance.

Governments of Bengal, the North-Western Provinces, and the Punjab, in the P. W. Dept.
Chief Commissioner of Oudh.

Also to the Chief Commissioner of the Central Provinces, and the Agent of the Governor General for Central India, for application only to the cases of stations occupied by troops of the Bengal Presidency.

Also to the Military and Financial Departments, and to the Accountant General, Public Works Department, for information and needful action.

C. H. DICKENS, *Colonel, R. A.,*
Secy. to the Govt. of India.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

CONTROL TO BE EXERCISED OVER EXPENDITURE ON PUBLIC WORKS FROM PROVINCIAL FUNDS.

Nos. 606—15 A—G, dated 19th September 1871.

RESOLUTION—By the Government of India, PUBLIC WORKS DEPARTMENT.

Read the following papers :—

Resolution of the Government of India, in the Financial Department, No. 3334, dated 14th December 1870.

Financial despatch from the Secretary of State, No. 59, dated 23rd February 1871.

Public Works Department memorandum to Financial Department, No. 150A—G, dated 6th March 1871.

Resolution of the Government of India, in the Financial Department, No. 2061, dated 6th April 1871.

RESOLUTION.—The resolution of the Government of India, in the Financial Department, No. 3334, dated 14th December 1870, having transferred the control of the outlay connected with provincial roads, civil buildings, and miscellaneous public improvements to local Governments and administrations, the Governor General in Council deems it necessary to explain, in view to the removal of misconception on the subject, the degree in which the rules for procedure laid down in the Public Works Code will be modified in regard to provincial works.

2. It has already been laid down in the Financial Department resolution above quoted that the Government of India has not renounced the administrative control which it possesses over the expenditure now treated as provincial. This control will be exercised in cases of any works undertaken which may be considered contrary to general policy, or which would involve extravagance or waste, or which, on the other hand, may be deemed deficient or inadequate for

the purpose in view. In fact, the control will be one of general policy, financial regularity, and prudence to be exercised on reviews of the *proceedings* and *accounts* of the local Governments and administrations. Such a control will not ordinarily require scrutiny of professional estimates for provincial works, nor any limitation in the amounts of estimates to be sanctioned; but the Government of India reserves to itself the right, if it sees special reasons for so doing, to object to any particular sum assigned for any object, or to call for the submission of detailed plans and estimates in any particular case.

3. The scrutiny of professional estimates for the works in question will, therefore, as a rule, rest entirely with the local Governments or administrations, and there will be no limitation in the amount of the estimate for provincial works which they will be competent to sanction. The selection and decision of the works to be carried out from provincial funds will also rest with local Governments and administrations, and consequently the power to make re-appropriations of provincial budget credits.

4. In the exercise of these powers the Governor General in Council deems it necessary to request that local Governments and administrations will take such measures as will ensure due financial regularity in the execution of provincial works. The preparation of complete plans and estimates should be invariably insisted upon before work is authorised to be commenced, and no expenditure should be allowed to be incurred without proper sanction to estimates and a formal appropriation of budget credits. And in the specific assignment of the available funds, special care should be taken, as far as practicable, that the works in progress are completed before new works are commenced, and that the execution of works is not permitted to be carried out dilatorily, or to be prolonged by short assignments of funds, *i. e.*, assignments insufficient to complete them within a reasonable period. In short, the Government of India desire that, as a rule, expenditure should be concentrated, and not diffused over a great number of works.

5. It is of course understood that the power which is vested in local Governments and administrations is on the condition that the expenditure shall be *bonâ fide* for a public object. The restriction laid down on this point in paragraph 51 of the budget rules is as applicable to provincial as to imperial works, and should not be lost sight of. Mereover, expenditure should not be incurred on works or objects beyond the limits that may have been fixed for the purpose by the Government of India, as in the case of churches and educational buildings. And in the preparation of plans for large works, such as central jails, attention should be paid to the principles which may be laid down by the Government of India for the designing and construction of such works, and, if need be, a reference made to the Government of India when it is thought desirable that those principles should be departed from.

6. The unlimited power which is vested in local Governments and administrations to sanction estimates for provincial works, renders it very necessary that extreme care should be exercised in entertaining proposals for the construction of public works involving large expenditure. Before such works are undertaken, the question as to whether sufficient funds will be available to admit of their completion within a reasonable time, should be carefully considered; and, in the distribution of provincial funds amongst the several provincial services, endeavours should be made to settle the grant for public works, so as to admit of the Engineers making proper arrangements for the expenditure of that grant on the understanding that it will not be disturbed during the year.

7. According to the rules contained in chapter VII, section 2, of the Public Works Code, certain civil authorities are invested with the power to sanction expenditure on civil buildings. But, under the altered circum-

stances of the case, it is left to the local Governments and administrations to determine whether those rules should remain in force or not, so far as regards provincial works. The same remark applies to the provisions of chapter X, section 1, paragraphs 11 to 15 of the code, regarding the works to be executed by civil authorities. And the restriction laid down in paragraph 4, chapter XI, section 1, of the code, requiring the sanction of the Government to selling or dismantling buildings, may be considered relaxed, so far as to admit of local Governments and administrations disposing of provincial works.

8. Under the orders of the Government of India, in the Financial* Department, the expenditure on public works from provincial funds is required to be kept distinct from local fund expenditure. To admit of this being done, the accounts of civil officers for expenditure incurred by them on provincial works should be rendered to Controllers in the same way as accounts of expenditure on imperial works, and under the rules and restrictions laid down in chapter XX, section 3, of the code.

* Financial Department resolution No. 1458, dated 21st June 1871.

9. It may be added that, when expenditure from both provincial and local fund is incurred on a work, it should be decided in the first place to what funds the work is to belong, and the contribution from the other fund is to be treated as a grant-in-aid. The outlay, then, from provincial funds is to be treated as would be done with imperial funds, according as it is itself a grant-in-aid, or is aided by a grant from other funds.

10. As regards establishment, it is necessary that proposals should be at once submitted by the several local Governments and administrations for dividing the existing establishments into "Imperial" and "Provincial." No difficulty is anticipated in making such a division, but it may be mentioned that, in cases of divisions having both imperial and provincial work to execute, the divisions may be classed under either head, a charge being made to provincial or imperial funds in the ratio of the expenditure incurred.

11. Proposals should also be submitted for dividing off the charges for the salaries and establishments of Superintending Engineers in the same way. The Chief Engineer and his office establishment, as also the office of account, may be considered imperial, but provincial funds should be required to contribute rateably towards their cost, according to the expenditure incurred.

12. By these arrangements, the establishments of the Public Works Department will be of four kinds, *viz.*,—

I.—Imperial Public Works Establishments for ordinary Imperial Public Works, chiefly for Military Buildings.

II.—Imperial Irrigation Establishments.

III.—Railway Establishments.

IV.—Provincial Public Works Establishments.

13. The nature of the control to be exercised by the Government of India over Provincial Public Works Establishments will be determined hereafter. Meanwhile, in the proposals herein called for, the probable expenditure in each provincial and imperial division should be stated, and the action of local Governments and administrations in respect to Public Works Establishments limited to the same extent as if those establishments were entirely imperial. On this point attention is invited to Public Works Department circular No. 31 of 1871.

14. It has already been laid down that a Provincial Public Works Budget Estimate should be submitted for the information of the Government of India.

As the necessary sequence to this, Controllers of Public Works Accounts should be required to submit to the local Governments, in the same way as is done for local fund outlay, a distinct appropriation account for provincial fund outlay. The orders on this account by the local Government or administration should be communicated to the Government of India.

ORDER.—Ordered, that this resolution be communicated to the Governments and administrations noted in the margin for information and guidance.

Governments of Madras, Bombay, Bengal, the North-Western Provinces, and the Punjab; the Chief Commissioners of the Central Provinces and Oudh.

Ordered also, that a copy be forwarded to the Home, Financial, and Agricultural and Revenue Depatrments for information.

C. H. DICKENS, *Colonel, R. A.*,

Secretary to the Government of India.

GOVERNMENT OF INDIA.

FINANCIAL DEPARTMENT.

ANNUAL REPORT ON THE OPERATIONS OF THE POST OFFICE OF INDIA FOR THE YEAR 1870-71.

No. 2725, dated 28th November 1871.

RESOLUTION—By the Government of India, FINANCIAL DEPT.

READ—

No. 2685, dated, Simla, 21st September 1871.

From—F. R. HOGG, Esq., *Offg. Director General of the Post Office of India,*

To—*The Secretary to the Government of India,* FINANCIAL DEPARTMENT.

I have the honor to submit the Annual Report on the administration of the Post Office of India for the year 1870-71.

2. Allusion will, as usual, briefly be made to a few of the leading events of the year before dealing with the statistics respecting the working of the department.

COMMUNICATIONS WITH PLACES ABROAD.

3. When the existing contract with the Peninsular and Oriental Company, dated 19th November 1867, was drawn up, the substitution of Brindisi for Marseilles as the European port for the embarkation and debarkation of the mails passing between England and India was clearly contemplated. Experimental trips made during the year 1869-70, having clearly established the superiority of the Brindisi route, this office was in communication with Her Majesty's Postmaster General for the permanent adoption of that route, when the sudden breaking out of the Franco-Prussian war and the subsequent disturbed state of France necessitated, in October 1870, the transmission, by what has been termed the Brindisi-German route, of the whole of that portion of the overland mail which formerly used to pass through Marseilles. To meet the continental transit expenses caused by the adoption of this new route, an extra rate of two annas per half ounce for letters, of eight pie for each newspaper not exceeding four ounces in weight, and a like increase per four ounces for each packet of books and patterns exceeding two ounces in weight, was levied in addition to the rates prescribed for

the Marseilles route. By a subsequent arrangement, however, the rates for letters to England *viâ* Brindisi were reduced to eight annas per half ounce, the rates for newspapers and books remaining unchanged at the figures noted in the margin. Similar alterations were caused in the rates chargeable on correspondence for other countries the route to which lies through England. The high combined transit rates to be paid to Italy, Germany, and Belgium for newspapers, books, and patterns sent by the Brindisi German route rendered any reduction of the postage on these classes of articles quite out of the question.

For each newspaper not exceeding 4 ozs.	For each packet of newspapers and books— Not exceeding 1 oz.	1 oz. to 2 ozs.	2 ozs. to 4 ozs. and for every additional 4 ozs.
A. P.	A. P.	A. P.	A. P.
2 8	1 4	2 8	4 8

4. The postage rates previously charged for correspondence with Foreign Europe *viâ* Trieste carried the covers only as far as Alexandria, and arrangements have consequently been made with the Austrian Government for the transmission of correspondence *prepaid to destination viâ* Trieste. Similar arrangements were concluded with the Italian Government for the transmission of correspondence between India and the principal countries in Europe through Italy at postage rates which carry all classes of covers to destination. The additional Italian transit rates caused by the transfer of the British mail packets from Marseilles to Brindisi have necessitated an enhancement of the postage rates on correspondence for Foreign Europe *viâ* France. A reduction was effected on the postage rates of letters destined for Prince Edward Island.

LOCAL STEAM SERVICES.

5. No material change has occurred in the steam services performed under contract with the British India Steam Navigation Company, which still consist of the following lines, *viz.*:—

(1). Calcutta and British Burmah, *weekly*, with a continuation to the Straits, *once every four weeks*, the subsidy being Rs. 21,333 per mensem, of which Rs. 1,083 are paid by the Straits Government.
(2). Bombay and Kurrachee, *weekly*, with a continuation to the Persian Gulf, *once a fortnight*, the subsidy being Rs. 23,111 per mensem.
(3). Calcutta, Bombay, and intermediate ports on the East and West Coast, *fortnightly*, the subsidy being Rs. 10,000 per mensem.
(4). Madras, Rangoon, and intermediate ports on the East Coast, *once every four weeks*, the subsidy being Rs. 6,000 per mensem.
(5). Calcutta, Port Blair, and Camorta, *six-weekly*, without any subsidy, but under contract arrangements in respect of the transmission of Government stores, &c.

6. The contract for this last-mentioned line has been extended for six months and will expire on the 15th March 1872. I now give below a list of steam services performed by other Companies. From this list it will be observed that the vessels of the Irrawaddy Steam Flotilla Company, which formerly used to ply only three times in the month between Rangoon and Mandalay, now run weekly, and that a monthly service between Mandalay and Bhamo has been organised:—

(1). By the Irrawaddy Flotilla and Burmese Steam Navigation Company for weekly communication between Rangoon and Mandalay, touching at the ports noted on the margin, with a monthly extension to Bhamo. Henzada, Myanoung, Prome, Thyetmyo.
(2). By the Irrawaddy Steam Flotilla Company for communication about three times a month between Rangoon and Mandalay.
(3). By the same Company for a monthly communication between Moulmein, Tavoy, and Mergui.
(4). By Jardine, Matheson and Company (of Hong-Kong) and Apcar and Company (of Calcutta) for the conveyance of mails monthly between Calcutta, the Straits and Hong-Kong, the dates of the starting of the steamers being regulated primarily with reference to the Calcutta opium sales.
(5). By the Euphrates and Tigris River Steam Navigation Company for fortnightly communication between Busreh and Bagdad.

MODIFICATION OF INLAND POSTAL RATES AND CONDITIONS.

7. In the year 1869-70, the system of charge for the transmission of banghy parcels was simplified by a reduction in the number of distance rates from five to two, the determination of distances being regulated by an easy method of geographical calculation. A further step in the same direction was made in the year under review, the system of charge by distance having been totally superseded by a uniform rate of charge irrespective of distance. This rate was fixed at three annas per ten tolas, the previously existing maximum limits of weights being retained, *viz.*, 640 tolas (*i. e.*, eight seers) on foot lines and 2,000 tolas (25 seers) on other lines. One of the results of this measure has been an increase in the number of small parcels entrusted to the Post Office for delivery. The postal organization is well adapted for such traffic, a business which the Railway Companies, by a high minimum rate of charge with a large limit of weight, purposely discourage as troublesome.

8. Another change to record is the withdrawal of the previously existing limit of weight (200 tolas) for inland books and patterns, the limit of size only (*viz.*, one foot and a half in length or one foot in width or depth) being retained, that limit having been found sufficient for all practical purposes. This limit of size was also made applicable to inland packets of patterns.

MODIFIED SYSTEM OF TREATING OFFICIAL CORRESPONDENCE.

9. A new set of official correspondence rules were introduced in April 1870, the main features of which were the withdrawal of the exemption previously given in respect of official correspondence conveyed by the General Post within the limits of a district and the provision of greater accuracy of account. Notwithstanding great obstacles, these rules have, on the whole, worked with considerable success; but, as they are now soon to be superseded by a new code of rules bringing the Indian system of treating official correspondence now in accordance with the English system, it is deemed unnecessary here to deal with the subject at greater length. In a subsequent section (Financial Results), however, I shall again refer more fully to this matter, and show how violently the operation of the new rules has affected the income of the department.

INTERCHANGE OF MONEY ORDERS BETWEEN ENGLAND AND INDIA.

10. A correspondence has taken place with the English Postal Authorities in regard to the interchange of money orders between the United Kingdom and India. The settlement of a fair rate of commission to the English Post Office on Indian drawals has formed the subject of correspondence, and it has moreover been found most difficult to devise a system which will regulate the payments to be made by the public in India, when obtaining orders on England, so as to correspond with a fluctuating exchange. It has been calculated that the public will have to pay as high as 7 per cent. above the commonly accepted par of 2 shillings for the rupee on orders issued in India, and at that high rate even it will require a considerable amount of business to remunerate the Indian Post Office. A complete set of rules have, however, been drawn up by Mr. Monteath, who is now personally arranging some details with the Post Office in England in view to the experimental introduction of the measure.

MISCELLANEOUS.

11. Arrangements have been made for the conveyance of correspondence between Peshawur and Cabul by a tri-weekly postal service passing through the Khyber Pass, and letters, if fully prepaid with ordinary Indian inland postage, are forwarded to the Indian Frontier Post Office at Peshawur, and there made over to the Postal Agent appointed by the Ameer of Cabul.

12. An important experiment was made in connection with a Traction Engine manufactured by Mr. R. W. Thomson of Edinburgh and tried on the road between Umballa and Kalka; this trial proving that Thomson's Road Steamer had surmounted many impediments supposed to exist in the application of steam power to road transit. Owing to some serious defects in the engine the experiment proved a failure, but the result was considered sufficiently encouraging for the deputation of a special officer (Lieutenant Crompton) to England with authority to arrange for the construction of four Road Steamers specially adapted to the requirements of India.

13. Notwithstanding the remonstrances of the Post Office of India, Her Majesty's Postmaster General has insisted on restricting the overland pattern post to *bonâ fide* samples, and endeavours are therefore being made to arrange, through the agency of the Post Office Department, a system under which packages can be forwarded unpaid from England *viâ* Bombay to any railway station connected with Bombay.

14. It was explained in last year's report that the junction of the railway systems of Bengal, Bombay and the Punjab necessitated the creation of a totally new system of railway sorting under a special officer designated "the Superintendent, Frontier Travelling Post Office," with his head-quarters at Allahabad. In the year under review this new system has been perfected, the jurisdiction of the Superintendent has been considerably extended, and two assistants have been added to his staff. The Superintendent, Frontier Travelling Post Office, has now the supervision of postal arrangements extending over 1,370 miles of railway, and some idea of the magnitude of his task may be gathered from the fact that, exclusive of the large quantity of correspondence conveyed in closed bags with contents already sorted, an average number of covers exceeding 40,000 daily are dealt with by the establishment under his control.

15. A general revision of the postal service was carried into effect in the Bhawulpore Native State, the authorities of which subsidised the department in return for increased postal facilities and the free transmission of its official correspondence within local limits.

16. The previously existing system of sliding scales of salaries for peons throughout India has been superseded by fixed salaries of different grades, experience having shown the sliding scale to be ill adapted to establishments of the grade of peons. It was found not only to entail great trouble upon the Audit Office, but the system was unpopular among the peons themselves.

17. An arrangement was also concluded with the Punjab Railway Company, under which a fixed composition payment on account of the conveyance of non-service banghy parcels was substituted for the previously existing system, based on a detailed calculation which involved trouble, inconvenience, and delay to the transit of the banghy mails.

18. Attention was directed to the low minimum pay of Rs. 150 attached to the grade of Inspecting Postmasters. It was found that inferior men were introduced in the lowest grade and gradually rose to higher grades, thus impairing the efficiency of the whole Inspecting staff. Authority was accordingly solicited to introduce by degrees four new grades of Inspectors, to the two lowest of which salaries fixed respectively at Rs. 200 and Rs. 250 were attached, the second grade having a salary commencing at Rs. 300 and rising by early increments to Rs. 400, and the first or highest grade with a minimum salary of Rs. 400, rising gradually to a maximum of Rs. 500. Sanction to this arrangement, which entailed no extra expense to the State, was received after the close of the official year now under report.

19. Another feature of the administration of the Post Office Department during the year 1870-71 was the bestowal of honorary distinctions (by way of title) on distinguished Native Post Office officials. The claims of these officials have hitherto been overlooked, a result due perhaps to the fact of this department not being directly connected with the several local Governments. The necessary representations were accordingly made, and the title of "Rai Bahadoor" conferred on Baboos Denobundhoo Mitter and Soorjee Narain Bannerjee in Bengal and on Lalla Saligram in the North-Western Provinces, and the title of "Rai Saheb" on Mr. Gunput Rao Raghoba in Bombay, in consideration of long and meritorious services respectively rendered by them to the State. For a like reason the Government of Bombay were pleased to confer on Mr. Cursetjee Pallonjee, Inspecting Postmaster of Guzerat, the honorary title of "Khan Bahadoor."

SECTION I.—POST OFFICES, LETTER BOXES, AND RURAL MESSENGERS.

20. In the margin an abstract has been given showing the number of Post Offices and Letter Boxes opened in the year under review; the details as affecting each Circle will be found in Appendix No. I. Out of whole number of 226 new Post Offices and 255 new Letter Boxes, 69 Post Offices and 81 Letter Boxes were opened in Bengal, 21 Post Offices and 76 Letter Boxes in Bombay, and 64 Post Offices and 30 Letter Boxes in the Punjab, and these have principally been established in small outlying villages which hitherto have possessed but few postal advantages. As in the preceding year, the exercise of great economy in the extension of its operations was forced on the Post Offices, in consequence of the recent financial pressure, and encouragement was not given to those measures which entailed enhanced expense with no prospective certainty of a corresponding increase of revenue. Although, therefore, the number of new Post Offices and Letter Boxes opened in the year under report is less than the number opened in the preceding year, the result cannot be regarded as unsatisfactory, especially when it is remembered that 237 additional Rural Messengers were employed (the great majority in the Bengal Postal Circle) as contrasted with 165 entertained in the previous year. These messengers are attached to Post Offices and have to traverse prescribed rounds, delivering and collecting letters among the agricultural population.

	Opened in 1869-70.	Opened in 1870-71.
Post Offices	262	226
Letter Boxes	515	255
TOTAL ...	777	481

21. On the 31st March last the number of Post Offices in all India stood at 2,743, and the number of Letter Boxes at 1,597, making a gross total of 4,340. On the same date the number of Rural Messengers or District Letter Carriers in the service of the department was 834.

22. I may mention here that the Letter Boxes attached to the mail trains on the Madras line of railway have been extensively used, the total number of covers posted in them having risen from 233,637 to 301,010, being an increase in number of 67,373. It is satisfactory to find this practical proof of appreciation by the public of the postal facilities tendered by the department.

SECTION II.—POSTAL LINES.

23. The total extent in miles of each class of Imperial Postal lines is compared in the margin with a corresponding statement for the preceding year; further details have been entered in Appendix II. The whole exhibits a gross increase of 1,130 miles in the length of all the Postal lines in India.

Year.	Railway.	Mail Cart Horse and Camel Dâk.	Runners and Boats.	Sea.	Total.
1869-70 ...	4,433½	5,333	32,498	5,613	50,877½
1870-71 ...	4,993½	4,175	37,226	5,613	52,007½
Increase ...	560	...	1,728	...	1,130
Decrease ...	...	1,158	...	...	...

24. Five hundred and sixty miles of railway were opened during the year under review in all India. On the East Indian line of railway communication was established between Seetarampore and Luckeseraie, commonly called the Chord line, which shortened the distance between Calcutta and Allahabad by 64 miles. An extension from Jagooty junction to Goalundo, now the starting point of the river steamers

for Dacca, lengthened the Eastern Bengal Railway line by 45 miles, and in the Punjab the opening of the Sutlej bridge overcame the gap of 14 miles which interrupted a continuous railway journey to Lahore. In Madras the branch line from Goondacul to Bellary, 32 miles in length, was established, and the north-west line was completed from Raichore to Gooty, a distance of 93 miles. In Bombay by uniting Khundwa with Jubbulpore the link was supplied, which effected a junction between the railway systems in the Presidencies of Bombay and Bengal. The south-west line of the Great Indian Peninsula Railway was also finished from Goolburgah to the river Kistna (73 miles), leaving a break of only 12 miles to conclude railway communication between the presidency towns of Madras and Bombay. Finally, two short lines of State Railway were opened in connection with the Great Indian Peninsula Railway, the one branching from Jullum to Khamgaum, 7½ miles in length, the other diverging from Budnaira with a terminus at Oomraotee, a distance of 5½ miles.

25. These railway extensions have of course superseded in a great measure postal communication by mail cart and have resulted in the abolition of the following lines, *viz.*:—

Nagpore and Jubbulpore.
Indore and Gwalior.
Goolburgah and Hyderabad.
Raichore and Gooty.
Loodiana and Phillour.

But apart from railway extensions many modifications have been effected, the net result of which has been a considerable reduction of mileage under the head of mail cart. In Bengal the recently established contract line from Dinagepore to Bugwa *vid* Rungpore broke down through the road being unfit for wheeled traffic. The Dhoolia and Munmar Tanga Dâk line was abolished in Bombay and a short line opened between Nassick and Deolalee. And in the North-Western Provinces, the two contract lines from Allahabad to Fyzabad and from Benares to Goruckpore, together with the departmental mail cart line between Bareilly and Nynee Tal, were done away with. I may here mention that, although the line from Umritsur to Pathankote in the Punjab is reckoned as a runners' line, the mails are actually carried in wheeled conveyances, belonging to the Military Horse Van Dâk, by a recent arrangement under which this Dâk is subsidised for the service it renders to the mails by a money payment equivalent to the cost of the previously existing foot line.

26. The large increase in mileage of runner and boat lines is due, partly to the supersession by foot lines of many of the recently abolished mail cart lines, partly to the extension to Bhamo of the steamer line between Rangoon and Mandalay, and partly to a variety of minor modifications which it would be tedious here to detail.

27. It may be interesting to note that the use of bicycles was introduced in the North-Western Provinces in connection with the mail service. On the Agra and Muttra road an average speed of 7 miles in the hour was attained by bicycle riders carrying a mail weighing 40 lbs.; but night travelling was found impracticable over a road blocked with traffic in country carts, and the experiment was therefore abandoned. Bicycles are, however, found useful in clearing outlying letter boxes and are employed with success for that purpose in Allahabad.

SECTION III.—CORRESPONDENCE.

28. The correspondence returns for each Circle will be found in Appendix III, the results for the whole of India being abstracted on the margin. The only head which shows a decrease is that of parcels, a result naturally consequent on railway extension coupled with the junction of the great railway systems of three Presidencies of India. So long as gaps existed on the arterial railway lines of this country, the Post Office was resorted to by the public as a convenient agency for the carriage of parcels, but now that continuous railway communication exists between all the chief towns in India, the high single rate, irrespective of distance, charged by the Post Office can hardly compete successfully with the cheaper rates, varying with distances actually traversed, imposed by the railway. The Post Office has thus lost and must continue to lose a considerable portion of its parcel traffic. As the Government is aware, the Post Office does not convey parcels, except such as may be sent on the public service, between places connected by railway where the railway authorities may have intimated their readiness to undertake the conveyance and delivery of parcels.

Year.	Letters.	Newspapers.	Parcels.	Books and Patterns.	TOTAL.
1869-70 ...	76,867,918	6,165,089	764,911	736,710	84,534,578
1870-71 ...	77,303,074	6,565,323	694,237	1,127,189	85,689,823
Increase ...	435,156	400,234	...	390,479	1,155,245
Decrease ...	...	...	70,674	...	...
Increase per-centage.	·56	6·49	...	53·01	1·36
Decrease per-centage.	...	...	9·24	...	...

29. At first sight the trifling increase (but little more than half per cent.) under the head of letters does not contrast favorably with the results of the previous year, results which exhibited a larger expansion than had ever before been recorded. This comparatively small increase is, however, more nominal than real, and has been caused by the new official correspondence rules, which have led to a less extravagant use of the post by Government officials, who are now learning to transmit by the most economical, though less expeditious book-post, bulky

service articles which used formerly to cumber the letter post. Thus, in the year under notice, a large quantity of articles which formerly used to appear under the head of "letters" have now been transferred to the head of "books and patterns," and hence we find that, while the rate of increase under the head of letters has in the year under review fallen from an average of nearly 8½ per cent. (deduced from the returns of the last six years) to only about half per cent., the rate of increase under the head of books has risen from an average of about 13 per cent. (deduced from the returns of the last six years) to the enormous extent of 53 per cent. This view is corroborated by the statistics to be found in a subsequent section (Financial Results), which show that, notwithstanding the apparently limited growth of correspondence in the year under report, the income of the department from non-official services has increased by more than two lacs of rupees.

30. I have given in the margin the usual statement analysing the letter returns in greater detail. The service column includes as heretofore those covers only which are issued by or addressed to the Public Offices contained in the privileged list, with which the Post Office keeps accounts of postage on official letters received and despatched, and to which, therefore, service postage labels are not affixed. The Government have been jealous in allowing additions to this list, and the result is a decrease of nearly 23 per cent. under this head.

Year.	Paid.	Unpaid.	Service.	Registered.	Total.
1869-70 ...	44,668,194	26,594,484	4,117,424	1,487,816	76,867,918
1870-71 ...	45,253,070	27,284,923	3,179,225	1,585,856	77,303,074
Increase ...	584,876	690,439	...	98,040	435,156
Decrease ...	...	...	938,199	...	...
Increase per-centage ...	1·31	2·59	...	6·58	·56
Decrease per-centage ...	...	...	22·78	...	...

31. The disposal of the correspondence entrusted to the Post Office for delivery may be shown as follows:—

Directly delivered (Appendix III) 80 per cent.	62,574,164
Retained for re-issue 20 per cent.	14,728,910
Total ...	77,303,074

Detail of Re-issue.

Sent to District Post Office	4,320,894
Sent to Dead Letter Office	2,260,489
Remainder disposed of by redirection to other Offices, or sent to Branch Offices, or in deposit at the end of the year	8,147,527
Total ...	14,728,910

32. A further statement is given below in which comparative statistics have been entered of the correspondence sent to and received from the United Kingdom during the years 1870-71:—

Detail of Correspondence.	Bulk Weight.		Estimated Number of half ounce Letter rate taken at 3 to each ounce net weight.		
	lbs.	ozs.	Weight in ozs.	Rate 3 Letters to each oz.	Aggregate Number of Letters.
Letters to the United Kingdom *vid* Southampton ...	8,088	4	129,412	× 3 =	388,236
Ditto ditto *vid* Brindisi ...	16,273	4	260,372	× 3 =	781,116
Letters from the United Kingdom *vid* Southampton ...	13,749	7	219,991	× 3 =	659,973
Ditto ditto *vid* Brindisi ...	16,202	14	259,246	× 3 =	777,738
Total of Letters ...	54,313	13	869,021	× 3 =	2,607,063

From this it appears that, by every mail London sends to India on an average 27,648 letters, and receives in return a weekly average of 22,487. In other words, England sends about 5 letters for every 4 it gets in return from India. I have been unable to obtain reliable data in respect to newspapers exchanged with England, but have arranged for the preparation of statistics, which will give the necessary information in the report for the current official year.

33. In his report for the year 1869-70, Mr. Monteath commented on the incompleteness of the statement of missent articles, representing as the only remedy the institution of an elaborate and expensive machinery, quite incommensurate with the advantage to be derived; it was considered inadvisable to continue admittedly imperfect statistics, and the return was therefore omitted. The Government in reviewing* the report expressed a wish to the effect "that the attempt to secure an accurate account of the facts in this respect should not be given up." I very much regret to have once more to report that it has been found impossible to reckon with any accuracy the number of covers missent by the Post Office to a wrong Sorting Office; the English Post Office has never been able to devise any simple system, and has consequently never attempted to give such statistics, and I have therefore thought it best, on the whole, again to omit the statement in question.

* *Vide* Resolution in the Financial Department, No. 2951, dated 11th November 1870 (para. 10).

34. There are Dead Letter Offices at Calcutta, Madras, Bombay, Agra, Lahore, and Kurrachee; details of the working of each of these offices will be found in Appendix IV, and the following comparison contains the results of the last three years:—

	Number.			Proportion of each class to the whole.		
	1868-69.	1869-70.	1870-71.	1868-69.	1869-70.	1870-71.
Letters returned to senders ...	880,933	971,405	1,100,086	42·66	44·61	48·66
Letters undisposable ...	1,184,201	1,205,920	1,160,403	57·34	55·39	51·34
Total ...	2,065,134	2,177,325	2,260,489	100	100	100

35. It is encouraging to note that the proportion of covers returned to the senders continues to improve. In 1863-64 this proportion to the whole stood at 32·23, and that the fact it has now risen to 48·66 is evidence of an improvement in the working of this branch of the department. A reference to Appendix IV shows that the Lahore Dead Letter Office has worked with the greatest success, the returns from Bombay and Kurrachee are decidedly good, and the position of Calcutta is slightly above the average. The results of the working of the Agra Dead Letter Office are very far from satisfactory, while those from Madras are decidedly bad. Dead Letter Office work in Madras with its many languages and characters is of course exceptionally difficult; but, with every allowance for these difficulties, the number of letters undisposable should not be so large as 71½ per cent. Of the whole number of covers received in all the Dead Letter Offices in India about 5 per cent. were imperfectly addressed, illegibly addressed, or wholly without address.

36. Appendix V contains the returns of the sale of ordinary postage stamps, and the abstract given below shows that the increase in the gross value of stamps, sold in 1870-71, as contrasted with 1869-70, is 3·95 per cent. against a corresponding decrease of 1·07 per cent. in the preceding year.

	8-pie Labels.	½-Anna Labels.	1-Anna Labels.	2-Annas Labels.	4-Annas Labels.	6-Annas 8-Pie Labels.	8-Annas Labels.	½-Anna Note paper.	½-Anna Envelopes.	1-Anna Envelopes.
	Increase.	Increase.	Increase.	Increase.	Increase.	Decrease.	Increase.	Increase.	Decrease.	Decrease
1868-69 as compared with 1867-68	40·48	4·47	5·28	17·58	7·69	43·88	82·15	146·37	45·69	62·1
			Decrease.	Decrease.	Decrease.			Decrease.		
1869-70 as compared with 1868-69	3·004	12·74	16·04	16·501	4·18	20·76	11·77	44·19	22·001	54·55
			Increase.	Increase.	Increase.					
1870-71 as compared with 1869-70	·71	8·22	3·34	3·58	6·12	43·33	5·74	*95·22	9·01	36·54

* Supplies of half-anna note paper are now no longer indented for, and the old stock is nearly consumed.

37. The increase in the sale of half-anna labels in the year 1869-70 was abnormally high owing to the newly introduced measure of doubling the limits of weight allowed for inland letters at the several rates of postage. The gross value of ordinary postage stamps sold has risen from Rs. 28,28,986 to 29,40,859 as compared with the year 1869-70, a result which will be noticed in greater detail in the section headed Financial Results.

38. The returns for the sale of service stamps are given in Appendix VI, which exhibits an increase of nearly a lac and a half as compared with the returns of the preceding year.

The increase is due to the refusal of Government to make additions to the list of offices with which accounts of postage are kept by the Post Office.

SECTION IV.—DISTRICT POST.

39. It has already been explained in the reports of previous years that the District Post is an organization intended to provide for the conveyance of local official despatches and reports in accordance with the requirements of each district, the cost being defrayed in some places by a special cess levied for the purpose, and in other places by the Government as a charge on the general revenues of the country. A subordinate object of the District Post is a provision for the collection and distribution of private correspondence in outlying towns and villages. During the year 1864-65 the entire management of the District Post of the North-Western Provinces was undertaken by the Postmaster General acting under the orders of local Government. A similar transfer occurred in the same year in Bombay, a complete re-organization of the District Post being effected in the ensuing year. These changes were followed by an improvement so marked as to lead in the year 1867-68 to the transfer of the entire District Postal arrangements in the Central Provinces to the control of the officers of this department and to the experimental assumption of the management of the District Post in one district in Bengal (the 24-Pergunnahs) and in one district in Madras (Trichinopoly). Negotiations were then entered into with the Punjab Government, with whom it was arranged in the year 1869-70 that the control of the District Posts in that province was to be undertaken by the Imperial Post Office on the completion of the revenue settlement of each district. And in the same year a similar transfer of 17 districts was effected in the province of Bengal and was attended with very great improvement both in the development of private correspondence and in an acceleration of the speed at which the mails were carried.

40. During the year under review, the District Post arrangements in seven additional districts in Bengal have, under the orders of the Lieutenant Governor, been added to the charge of the Postmaster General, who reports that "safety, speed, and punctuality have increased under the management of the Postal Department." In Madras the final orders of the local Government are still awaited in respect to the permanent transfer to the control of this department of the one District (Trichinopoly), in which District Post arrangements have been entrusted to the care of the Post Office. The Postmaster General has satisfactorily proved that under his administration, the correspondence of the Trichinopoly District has considerably developed, while the number of covers returned as undeliverable have diminished. It is to be regretted that the Government of Madras hesitate so long in permitting the extension of a system the advantages of which have been established by actual experiment in almost every other part of India. But if the system is to work at all, it must be carried out by a hearty co-operation between the Civil Authorities and the Post Office officials; any antagonism between the two would be fatal to success, and I have not therefore thought fit to press the Government of Madras to an immediate decision, but am awaiting with some anxiety the result of the decision anticipated in the following extract from the Postmaster General's report: "The Board of Revenue are, however, calling for reports from all the Collectors as to the working of the existing system in each district, and it is probable that, when the Revenue Board has made its report, final orders will be issued by Government on the whole question." The Postmaster General of the Punjab had, at the close of the year under notice, appointed Sub-Inspectors and was in the eve of submitting a tabular statement to the local Government for the establishment necessary to assume charge of the District Post in 12 districts where he purposed to introduce a new method of delivering and collecting correspondence. The obstacle to any interference on the part of the Imperial Post Office with the District Post arrangements in Oudh has, in the reports of the last two years, been represented as due to the fact of that province being subject to the jurisdiction of the Postmaster General of the North-Western Provinces. Sanction has since been given to the appointment in Oudh of a Chief Inspecting Postmaster with the powers of a Postmaster General; but as that Officer (Mr. Dillon) assumed charge of his new office in March 1871, the results of his administration will be noticed in the report for the ensuing official year.

41. Appendix VII contains the results of the operation of the District Post so far as the correspondence passing between it and the Imperial Post is concerned; the usual abstract is given below:—

	Number.	Percentage.
Sent to District Post for delivery ...	4,567,873	Being 5·44 per cent. of the total number of covers received for delivery.
Portion of the above received back undelivered ...	483,819	Being 10·59 per cent. on the number sent to District Post.
Received from District Post	2,887,827	Being 3·38 per cent. on the total number received by General Post Office for delivery.

42. These returns exhibit a small decrease, as contrasted with the previous year, in the number of covers sent for delivery to the District Post, this decrease being the result of extensions of the Imperial Post to localities previously served by the District Post. There is a slight increase in the number received from the District Post, this increase having chiefly taken place in Madras, where this department has but little opportunity of extending its operations into the interior of districts. A slight improvement is noticeable in the proportion of covers received back undeliverable.

SECTION V.—MISCELLANEOUS.

43. With the permission of Government the statement showing the complaints made by the public has been discontinued. I may mention, however, that, notwithstanding the increase in the number of Post Offices opened, the total number of complaints made by the public has fallen by more than a hundred, this decrease having mainly occurred in Bengal, Bombay, and the North-Western Provinces. I have every reason to believe that the complaints made by the public receive the most careful attention from the several Postmasters General and Chief Inspectors.

44. Punishment has been inflicted upon Post Office employés for offences committed in 160 cases as compared with 136 for the previous year. Legal convictions were secured in 71 cases, and in 89 instances departmental punishment was bestowed. Appendix VIII gives the number of cases which belong to each Postal Circle.

45. It is satisfactory to notice a diminution in the number of highway robberies of the mails, which, as shown by the marginal abstract, have fallen from a total of 31 in the year 1869-70 to a total of 25 in the year under report, while the number of robberies in British India has remained stationary at 11; the number committed in Native Territory has decreased from 20 to 14. From the following statement it will be seen that of this last-named class three occurred in Cutch and Kattyawar and two in Jeypore, the remainder being isolated instances distributed over a variety of independent States:—

Statement of Highway Robberies.

Names of Postal Circles.	1869-70. British Territory.	1869-70. Foreign Territory.	1869-70. Total.	1870-71. British Territory.	1870-71. Foreign Territory.	1870-71. Total.
Bengal	3	...	3	5	...	5
Madras	2	6	8	2	1	3
Bombay	...	2	2	...	6	6
N. W. Provinces ...	4	11	15	4	7	11
Punjab	1	1	2	...	...	...
British Burmah ...	...	...	...	...	...	...
Central Provinces ...	1	...	1	...	...	...
Sind	...	...	...	...	...	...
Total ...	11	20	31	11	14	25

	British Territory.			Foreign Territory.		
Bengal ...	Hazareebaugh ... 3 Tirhoot ... 1 Dinagepore ... 1	Besides three attacks, *i. e.*— Burhya ... 1 Bancoorah ... 1 Tirhoot ... 1				
Madras ...	Kistna ... 2	Besides one attack in Malabar.				
Bombay ...	...	...		Hyderabad ... 1 Cutch and Kattyawar ... 3 Mahee Canta ... 1 Palunpore ... 1 Marwar ... 1	Besides five attacks.	
N. W. Provinces ...	Allygurh ... 1 Etawah ... 1 Muzuffernuggur 1 Agra ... 1	Besides five attacks, *i. e.*— Meerut ... 1 Budaon ... 2 Allygurh ... 1 Allahabad ... 1		Jeypore ... 2 Indore ... 1 Kishengurh ... 1 Bhopaul ... 1 Rajgurh ... 1 Joudhpore ... 1	Besides nine attacks, *i. e.*— Duttia Bundelcund 1 Indore ... 1 Boondee ... 1 Meywar ... 1 Gwalior ... 2 Rajgurh ... 1 Oodeypore 1 Joudhpore 1	
Total ...	11	Besides nine attacks		Total ... 14	Besides fourteen attacks.	

Grand Total 25, besides 23 attacks.

46. The total number of persons employed in the Post Office Department amounts to 24,690, as shown in Appendix IX; the marginal abstract comprehends the establishments in all grades below the grade of Postmasters General, and shows a net decrease of 140 in comparison with the return of last year. This diminution is solely due to the supersession of road establishments by railway extension. In other respects the number of postal servants has increased, and must necessarily continue to increase year by year in proportion to the extension of the operations of the Post Office.

Postal Officials.	1869-70.	1870-71.
Inspecting Postmasters ...	101	133
Postmasters and Deputy Postmasters ...	2,172	2,304
Clerks ..	1,761	1,862
Peons, &c. ...	5,248	5,281
Road Establishment ...	15,537	15,099
TOTAL ...	24,819	24,679

SECTION VI.—NON-POSTAL BRANCHES OF THE DEPARTMENT.

47. Bullock Train offices were opened in the year under report at Meerut and Nynee Tal and a Bullock Train line between Meerut and Nynee Tal. The extension of the railway communication necessitated the closing of the line from Gwalior to Indore, together with the six Bullock Train offices situated on that line. On the 1st April 1871, therefore, there were 59 Bullock Train offices in India, with lines of communication consisting of a main line from Calcutta to Peshawur, with branches to Darjeeling, Jubbulpore, Lucknow, Fyzabad, Futtehgurh, Gwalior, Nynee Tal, Landour, Simla, Ferozepore, Mooltan, Sealkote, and Murree.

48. On the completion of railway communication between Bengal and Bombay, the military transport train between Jubbulpore and Nagpore was abolished in March 1870. No alterations have been made in the Punjab Military Van Dâk, the lines served by that Dâk being the same as those specified last year, *viz.*:—

Meean Meer to Peshawur.
Lahore to Ferozepore (*vid* Meean Meer).
Wuzeerabad to Sealkote.
Rawul Pindee to Murree (during the summer months only).
Umritsur to Pathankote (during the summer months only).

49. In October 1870, the mail cart horse establishment was increased on the Umballa and Kalka line so as to meet more fully the requirements of passengers on that line. The arrangement has proved a great convenience to travellers, while the increased expense entailed has been more than met by the additional fares collected. I may also mention that on other lines where mail cart communication exists, passengers are allowed to travel with the mails.

50. I have in a previous paragraph (5) dealt with the lines of steam communication under contract with the British India Steam Navigation Company, which it has been found convenient to place under the management of the Post Office Department.

SECTION VII.—FINANCIAL RESULTS.

51. From a variety of causes which have been duly detailed in previous reports, the expenditure of the Post Office Department has been growing year by year, and the annual deficit, excluding official postage, has been steadily on the increase. It is therefore eminently satisfactory to be able to record an increase of revenue together with a decrease of expenditure, in the year under review which fully bears out the anticipations expressed in the last Annual Report.

52. The revenue derived both from official and private correspondence has increased by more than 11½ lacs, and would have increased by 15½ lacs but for a heavy payment of £40,000 (or 4 lacs of rupees) made to the London Post Office in, adjustment of an outstanding steam postage account for British postage, the discharge of which has hitherto been delayed by the difficulty experienced in the settlement of fair rates. Excluding official postage, there is a decrease of Rs. 1.84,612, which would have been an increase of Rs. 2,15,388 but for the deduction specified above. Thus the doubling of the limits of weight allowed for inland letters, introduced on the 1st April 1869, has, in the second year of its experiment, proved beneficial to the department even in a strictly financial point of view.

53. Some remarks are called for in explanation of the very large increase (Rs. 13,51,497) under the head of official postage and sale of service stamps. This increase is due partly to the fact that, prior to the year under notice, the system of bringing official postage to account was incomplete and resulted in a large amount of official postage being omitted from account; it is also partly owing to the inclusion in the accounts of the postage upon what is termed "district correspondence," *i. e.*, official correspondence conveyed by Imperial Post lines within the limits of a district. As regards the increase on account of district correspondence, I may remark that prior to 1866 all official correspondence conveyed by the Imperial Post, whether passing within the limits of a district or otherwise, was included in one general account when calculating the revenue of this department from official sources. In 1866 a new system of charging official postage was introduced, and, as that system could not readily be applied to official postage on district correspondence conveyed by the Imperial Post, it was thought better

for a time wholly to exclude that correspondence from account. But in April 1870 a scheme was introduced under which all difficulties in the way of bringing district correspondence to account under the new system were overcome by a provision for the grant of tickets carrying local privileges to officials in the interior of districts, the postage due on the correspondence conveyed thereunder being included in the postage account kept at the head-quarters of the districts.

54. The above sketch will account for the sudden fall of official postage from 50 lacs in the year 1865-66 to 26 lacs in the following year, and its equally sudden rise from Rs. 28,87,627 in the year 1869-70 to Rs. 42,39,124 in the year under report.

55. There has been a decrease in the expenditure of the purely Postal Department during the year under review amounting to Rs. 4,19,212. The decrease has principally occurred under the head of "Mail Cart," a result due partly to a more economical administration of the department, but mainly to the extension of railway communication. A considerable reduction has also occurred in the miscellaneous and contingent charges of the department.

56. Appendices X and XI will be found to exhibit the usual financial statistics of the purely postal service and its non-postal branches, and the following abstracts will show the general results:—

REVIEW OF FINANCIAL RESULTS.

	1869-70. Rs. A. P.	1870-71. Rs. A. P.
PURELY POSTAL SERVICE.		
Receipts, including official postage and sale of service postage stamps	68,16,010 9 4	79,82,895 8 7
Receipts, excluding official postage and sale of service postage stamps	39,28,383 5 10	37,48,771 4 5
Disbursements	55,96,779 11 4	51,77,567 1 9
Net revenue, including official postage and sale of service postage stamps	12,19,230 14 0	28,05,328 6 10
Net deficit, if official postage and service postage stamps be excluded	16,68,396 5 6	14,33,795 13 4
NON-POSTAL BRANCHES.		
Bullock Train.		
Receipts	10,46,249 8 1	7,92,510 9 9
Disbursements	10,16,618 13 11	* 8,90,182 7 7
	Excess of Receipts. 31,630 10 2	Deficit. 97,671 13 10
Punjab Military Van Dâk.		
Receipts	2,56,505 10 3	2,14,9[illegible] 4 8
Disbursements	2,52,847 13 11	2,33,[illegible]0 10 8
	Excess of receipts. 3,657 12 4	Deficit. 18,488 6 0
Passenger Services on Mail Cart Lines.		
Receipts	1,57,196 12 6	93,392 6 6
Disbursements	1,57,196 12 6	93,392 6 6
Military Transport Train.		
Disbursements	1,57,550 0 6	875 3 4
Contract Subsidies to Local Steamers engaged primarily for Non-Postal Services.		
Disbursements	5,05,574 7 8	7,74,694 5 9

* Purely Bullock Train ... ... Rs. 8,39,406 3 1
Road Steamer 26,605 6 5
District Dâk 24,170 14 1
8,90,182 7 7

Briefly stated, these results show—

		Rs.	
(1)	A net revenue in the purely Postal Department of ...	28,05,328	if official postage be included.
(2)	A net deficit in the purely Postal Department of ...	14,33,795	if official postage be excluded.
(3)	A net deficit in the Bullock Train Department of ...	97,671	including charges for the extension of District Dâk as noted above.
(4)	A net deficit in the Punjab Military Van Dâk of ...	18,488	

57. In the last Annual Report it was explained that the receipts and net revenue had for the first time been reduced by a subtraction of the amount of discount on the sale proceeds of postage stamps which in that year came to Rs. 1,38,429. A like deduction has again been made in the year under report amounting to Rs. 1,45,639.

58. Although the charges against the Bullock Train Fund of this department have been reduced by about 1¼ lacs, the receipts have fallen by about 2½ lacs, the net result being an expenditure of Rs. 97,671 in excess of revenue derived. This result is largely due to the extension of continuous railway communication and the consequent loss of traffic formerly consigned to the Government Bullock Train, whose charges for railway transit are somewhat higher than those of the several Railway Companies it employs. Another cause of the great fall in the Bullock Train revenue lies in the fact that the receipts for the years 1868-69 and 1869-70 were abnormally high, because the agricultural population were so impoverished and their cattle so reduced by the famine of those two years that country carts were not to be obtained on hire, and a large quantity of traffic, which under other circumstances would have been diverted in another channel, found its way to the Government Bullock Train. Steps have been taken to ascertain the financial condition of every Bullock Train line in India with the view of reducing the expenditure on such lines as may not prove self-supporting.

59. The expenses incurred in maintaining the Government Bullock Train have this year been separated from the charges debited against the fund for other purposes.

60. In the Punjab Military Horse Van Dâk there is a deficit of Rs. 18,488 against a net revenue of Rs. 3,657 in the preceding year. This result is attributable partly to the maintenance of certain branch lines which have not covered their working expenses and partly to the Punjab Military Horse Van Dâk fund being debited with disbursements paid under special orders for purely postal objects. Steps have been taken to close those lines the disbursements on which are not covered by their receipts, and there still remains a considerable surplus at the credit of this fund from the profits of previous years.

61. The large decrease both in receipts and disbursements under the head of "Passenger Service on mail cart lines" is the result of closing several mail cart lines consequent on railway extension. I allude especially to the line between Jubbulpore and Nagpore.

62. In the last Annual Report it was stated that the Military Transport Train was totally abolished on the completion of railway communication between Bengal and Bombay.

63. The increase of about 2½ lacs in contract subsidies to local steamers is only nominal, as the disbursements for the year under report include arrear payments due for the latter months of the previous official year.

64. I have, as in recent reports, noted on the margin certain items of free service not included in the Post Office Accounts. The estimate for railway free service, previously exhibited at Rs. 1½ lacs, has been increased to 1¾ lacs in consequence of the railway extensions already detailed. The estimate on account of stores for the Post Office purchased or manufactured in England has been framed as correctly as possible from the materials available in this office.

	Rs.
Railway free service (estimate)	1,75,000
English stores (estimate)	10,000
Free service rendered by the Government Press, Calcutta (estimate)	25,295
TOTAL ...	2,10,295

SECTION VIII.—GENERAL REVIEW OF PROGRESS SINCE 1854.

65. The figures in the margin show the number of letters and newspapers received for delivery in the year under report, as compared with the number received in the year prior to the introduction of the Post Office Act of 1854. Appendix XII gives the figures for intermediate years with the details in respect to each postal circle. I have already explained in a previous section (correspondence) that the apparently small increase under the head of letters is attributable to the large number of service covers which have now for the first time passed from the heading of letters to swell the enormous increase already reported under the head of books.

PROGRESS OF CORRESPONDENCE SINCE 1854.

Number of letters and newspapers received for delivery in the year under review as compared with the numbers received in the year prior to the introduction of the Post Office Act of 1854.

A year before the Act XVII of 1854 came into operation ...	19,082,676 = 100
1868-69	74,664,817 = 391
1869-70	83,032,957 = 435
1870-71	83,868,397 = 439

66. In 16 years the correspondence of the country has more than quadrupled itself, and yet, while in England each person receives an average of 27 letters annually, the 77 millions of letters delivered in India in the year 1870-71, if distributed throughout a population roughly estimated at 200,000,000, would give an average of only about one-third of a letter to each individual. I think that a considerable further development of the correspondence of India may be anticipated.

67. It may be interesting to add that 2½ millions of articles were sent by newspaper post in 1854-55 against 6½ millions in 1870-71; the book packets which, in the year 1854-55, numbered only 133,000, have, in the year under notice when included with pattern packets, increased to more than a million, while the annual number of bangby parcels which in 1854-55 stood at 463,000 has now risen to 694,000.

Progress of purely postal revenue.

YEAR.	Per-centage.
1853-54, last complete year of former rates...	128
1855-56, first complete year	100
1864-65, tenth ditto	214
1865-66, eleventh ditto	222
1866-67, twelfth ditto	230
1866-67, (ditto exclusive of Straits Settlement)	227
1867-68, thirteenth ditto	237
1868-69, fourteenth ditto	258
1869-70, fifteenth ditto	246
1870-71, sixteenth ditto	235

68. I also submit the usual statement (Appendix XIII) showing the progress of purely postal revenue derived solely from private correspondence from 1853-54 up to date. As already explained, the reduction of revenue from private correspondence is due to a heavy arrear payment equal to four lacs of rupees made to the London Post Office.

SECTION IX.—NOTICES OF POST OFFICE OFFICIALS.

69. During the whole of the year under review, the Post Office Department was administered by Mr. A. M. Monteath, now absent on leave.

70. Since August 1870, Mr. J. Tweedie, a Bengal Civilian, has officiated as Postmaster General of Bengal, and Major Battye, the Postmaster General of Bombay, was, in November last, succeeded by Mr. J. MacFarlan, a Bombay Civilian. To these officers as well as to Mr. Brown, the Compiler of Post Office Accounts and now acting as Officiating Deputy Director General of the Post Office, to Colonel Pears, the Postmaster General of Madras, to Major Lane, the Postmaster General of the Punjab, to Mr. Hutchinson, Postmaster General of the North-Western Provinces, to Major Fanshawe, Chief Inspecting Postmaster of British Burmah, to Mr. Beauvais, Chief Inspecting Postmaster of Sind and the Persian Gulf, to Mr. Hoghton, Acting Chief Inspecting Postmaster of the Central Provinces, and to Mr. George, the Superintendent, Frontier Travelling Post Office, the thanks of this office are due.

71. Mr. Douglas, selected by Mr. Monteath for special duty in connection with the revision of departmental forms, has specially distinguished himself by good service. I would also take this opportunity of acknowledging the services of Mr. C. K. Dove, Officiating Deputy Director General of the Post Office, who, after a long connection with the Postal Department extending over nearly 17 years, retired on pension in February 1871.

72. In Bengal the Postmaster General has named Rai Denobundhoo Mitter Bahadoor, Rai Soorjee Narayan Banerjee Bahadoor, Doorga Narayan Banerjee, Mr. Dillon and Mr. Roussac, all Inspecting Postmasters, as conspicuous for good service. In Madras the Post Master General desires to recognise the merits of Mr. Percy, Postmaster of Madras, and of Mr. Hodges, Inspecting Postmaster. The Postmaster General of Bombay wishes to acknowledge the services of Inspecting Postmaster Khan Saheb Cursetjee Pallonjee, and of Messrs. Hutton, Hynes, and Barwise, engaged in the marine postal service, and speaks in the highest possible praise of his Head Assistant Rai Saheb Gunput Rao Raghoba. In the North-Western Provinces Rai Saligram Bahadoor and Mr. Miller, both Inspecting Postmasters, head the list of officers noted by the Postmaster General for special mention. In the Punjab Mr. Faichnie, Inspecting Postmaster, has maintained the high reputation he always has held, Mr. Alpin has distinguished himself in the organisation of a Railway Travelling Post Office, and Mr. Sheridan, the Supernumerary Inspecting Postmaster, is highly praised by the Postmaster General; Mr. Buckner has maintained the Umballa and Simla postal line in a high state of efficiency, and Mr. Higgins, the Postmaster of Simla, has given great satisfaction. The Chief Inspector of the Central Provinces has expressed his satisfaction with the work of Mr. McLoughlin, Inspecting Postmaster, and Mr. Smith, Head Clerk of his Office, and in Burmah Mr. Antram, Officiating Postmaster of Rangoon, is mentioned as a meritorious Officer.

73. In the Sind Postal Division, Mr. Thaddeus, the Postmaster of Bagdad, has shown marked diligence in the execution of his duties.

APPEND X No. I.

Statement showing the number of Post Offices and Letter-Boxes which were opened during the years 1869-70 *and* 1870-71, *and the total number that stood at the end of those official years.*

Names of Postal Circles.	Opened in 1869-70.		Existing on the 31st March 1870.		Opened in 1870-71.		Total of 1870-71.		Closed or Discontinued.		Balance on the 31st March 1871.	
	Post Offices.	Letter-Boxes.	Post Offices.	Letter-Boxes.	Post Offices.	Letter-Boxes.	Post Offices.	Letter-Boxes.	Post Offices.	Letter-Boxes.	Post Offices.	Letter-Boxes.
Bengal	93	108	659	117	69	81	728	198	2	6	726	192
Madras	19	10	345	118	13	20	358	138	9	6	349	132
Bombay	22	153	528	718	21	76	549	794	72	68	477	726
North-Western Provinces	30	9	492	153	39	14	531	167	4	...	527	167
Punjab	70	172	375	200	64	30	439	230	14	...	425	230
British Burmah	1	...	19	...	...	...	19	...	...	...	19	...
Central Provinces	15	58	153	111	18	12	171	123	11	...	160	123
Sind	12	5	58	5	2	22	60	27	...	...	60	27
Total ...	262	515	2,629	1,422	226	255	2,855	1,677	112	80	2,743	1,597

ABSTRACT.

Total number of Post Offices and Letter-Boxes opened in 1869-70	777		
Ditto ditto existing on the 31st March 1870	4,051		
Ditto ditto opened in 1870-71	481		
		4,532	
Ditto ditto closed in 1870-71		192	
Gross number of Post Offices and Letter-Boxes existing on the 31st March 1871			4,340

APPENDIX No. II.

Statement showing the distance over which Mails were conveyed throughout India by Railway, Mail Cart, Horses, Runners and Boats, during the years 1869-70 *and* 1870-71.

Names of Postal Circles.	Railway.		Mail Cart, Horse or Camel Dak, &c.		Runners or Boat Lines.		Sea.		Total.	
	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870 71.
Bengal	787	957	440	363	8,203	8,727	2,837	2,837	12,267	12,884
Madras	892¾	1,017¾	371	144	6,655	6,272	...	...	7,918¾	7,433¾
Bombay	1,231	1,314	987	837	6,723	6,062	567	567	9,508	8,780
North-Western Provinces	548	548	1,452	828	6,400	7,082	...	...	8,400	8,458
Punjab	553	567	1,023	1,013	2,978	3,073	...	...	4,554	4,653
British Burmah	...	...	...	...	1,338	1,755	324	324	1,662	2,079
Central Provinces	317	485	164	98	2,477	3,495	...	...	2,958	4,078
Sind	105	105	896	892	724	760	1,885	1,885	3,610	3,642
Total ...	4,433¾	4,993¾	5,333	4,175	35,498	37,226	5,613	5,613	50,877¾	52,007¾

APPENDIX

Comparative Statement showing the Number of Letters, Newspapers, Parcels and Books received for delivery in the Post Offices under the Post Masters General of

NAMES OF POSTAL CIRCLES.		LETTERS.														NEWSPAPERS.		
		Delivered at the Window or sent out for Delivery by Peons.				Retained at Office as Unclaimed, or for Redirection, or for District Post.				Total Number received.				Grand Total.		Delivered at the Window or sent out for Delivery by Peons.		
		Paid.	Unpaid.	Service.	Registered.	Paid.	Unpaid.	Service.	Registered.	Paid.	Unpaid.	Service.	Registered.			Paid.	Unpaid.	Service.
Bengal ...	1869-70	8,181,023	4,484,239	211,426	463,381	792,495	1,874,293	27,844	69,407	8,973,518	6,358,532	239,270	532,788	16,104,108		1,112,710	37,088	8,934
	1870-71	**8,758,995**	**4,823,505**	**181,774**	**505,111**	**989,069**	**2,275,514**	**22,355**	**86,598**	**9,748,064**	**7,099,019**	**204,129**	**591,709**	**17,642,921**		**1,155,808**	**39,622**	**9,673**
Madras ...	1869-70	7,384,355	1,424,249	221,933	204,547	1,534,977	792,233	62,372	44,265	8,919,332	2,216,482	284,305	248,812	11,668,931		838,032	43,958	17,113
	1870-71	**7,627,765**	**1,491,240**	...	**218,262**	**1,614,039**	**810,784**	...	**45,886**	**9,241,804**	**2,302,024**	...	**264,148**	**11,807,976**		**913,680**	**42,705**	...
Bombay ...	1869-70	7,590,822	4,012,061	2,625,301	235,331	892,946	1,856,923	558,356	39,498	8,483,768	5,868,984	3,183,657	274,829	17,811,238		1,010,608	52,888	26,734
	1870-71	**7,111,772**	**3,591,764**	**2,009,925**	**221,601**	**760,770**	**1,415,271**	**370,662**	**31,028**	**7,872,542**	**5,007,035**	**2,380,587**	**252,629**	**15,512,793**		**972,767**	**51,452**	**33,860**
N.-W. P. ...	1869-70	8,319,183	5,164,161	360,171	218,671	853,545	2,133,974	49,060	37,859	9,172,728	7,298,135	409,231	256,533	17,136,627		928,622	50,367	11,726
	1870-71	**8,155,168**	**5,475,952**	**303,973**	**232,697**	**786,056**	**2,267,545**	**47,429**	**45,528**	**8,941,224**	**7,743,497**	**351,402**	**278,225**	**17,314,348**		**1,049,503**	**61,685**	**9,734**
Punjab ...	1869-70	4,979,166	2,322,098	...	87,819	915,846	1,131,150	...	15,192	5,895,012	3,453,248	...	103,011	9,451,271		567,240	111,144	...
	1870-71	**4,839,905**	**2,113597,**	...	**88,755**	**867,021**	**1,187,128**	...	**15,009**	**5,706,926**	**3,300,723**	...	**103,764**	**9,111,413**		**674,595**	**74,423**	...
B. Burmah ...	1869-70	301,884	203,066	961	11,000	4,580	7,367	...	104	306,464	210,433	961	11,104	528,962		145,752	11,248	438
	1870-71	**306,167**	**204,520**	**893**	**11,718**	**6,185**	**11,306**	**1**	**129**	**312,352**	**215,826**	**894**	**11,847**	**540,919**		**156,249**	**10,095**	**554**
C. Provinces ...	1869-70	1,181,347	485,146	...	28,313	208,133	318,944	...	3,507	1,389,480	804,090	...	31,820	2,225,390		155,088	7,886	...
	1870-71	**1,545,161**	**759,216**	**168,831**	**42,324**	**268,310**	**478,606**	**73,382**	**9,113**	**1,813,471**	**1,237,822**	**242,213**	**51,437**	**3,344,943**		**222,094**	**8,955**	**808**
Sindh ...	1869-70	1,373,619	276,603	...	24,008	154,243	107,977	...	4,911	1,527,892	384,580	...	28,919	1,941,391		121,501	9,164	...
	1870-71	**1,476,525**	**280,930**	...	**26,118**	**140,162**	**98,047**	...	**5,979**	**1,616,687**	**378,977**	...	**32,097**	**2,027,761**		**136,019**	**9,597**	...
GRAND TOTAL	1869-70	30,311,429	18,371,623	3,419,792	1,273,073	5,356,765	8,222,861	697,632	214,743	44,668,194	26,594,484	4,117,424	1,487,816	76,867,918		4,879,553	323,243	64,945
	1870-71	**39,821,458**	**18,740,724**	**2,665,396**	**1,346,586**	**5,431,612**	**8,544,199**	**513,829**	**239,270**	**45,253,070**	**27,284,923**	**3,179,225**	**1,585,856**	**77,303,074**		**5,280,215**	**298,534**	**54,629**

No. III.

Bengal, Madras, Bombay, North-Western Provinces and Punjab, and Chief Inspectors of Post Offices, British Burmah, Central Provinces and Sindh.

NEWSPAPERS.							PARCELS.									BOOKS AND PATTERNS.		
Retained at Office as Unclaimed, or for Redirection or for District Post.			Total Number received.			Grand Total.	Delivered at the Window or sent out for Delivery by Peons.			Retained at Office as Unclaimed, or for Redirection, or for District Post.			Total Number received.			Grand Total.	Number of Steamer Books delivered.	Number of Indian Book-Post Packets delivered.	Total.
Paid.	Unpaid.	Service.	Paid.	Unpaid.	Service.		Paid.	Unpaid.	Service.	Paid.	Unpaid.	Service.	Paid.	Unpaid.	Service.				
117,307	7,605	880	1,230,017	44,693	9,814	1,284,524	64,731	28,737	52,584	7,789	3,942	2,844	72,520	32,679	55,428	160,627	15,820	135,161	150,981
136,618	**7,750**	**1,532**	**1,291,926**	**47,372**	**11,205**	**1,350,503**	**61,472**	**34,863**	**40,076**	**7,936**	**4,617**	**1,630**	**69,408**	**39,480**	**41,706**	**150,594**	**81,975**	**127,534**	**209,509**
283,727	15,568	22,900	1,121,759	59,526	40,013	1,221,298	28,363	29,766	46,328	9,247	4,582	9,116	37,610	34,348	55,444	127,402	30,195	122,921	153,116
305,720	**14,382**	...	**1,219,400**	**57,087**	...	**1,276,487**	**31,697**	**30,792**	**32,297**	**12,779**	**5,469**	**4,231**	**44,476**	**36,261**	**36,528**	**117,265**	**34,281**	**174,303**	**208,584**
122,957	14,888	6,369	1,133,565	67,776	33,103	1,234,444	37,208	23,309	57,759	6,063	3,581	8,297	43,271	26,890	66,056	136,217	37,251	67,864	105,115
107,207	**14,201**	**2,829**	**1,079,974**	**65,653**	**36,689**	**1,182,316**	**30,350**	**20,810**	**20,617**	**6,801**	**3,865**	**2,195**	**37,151**	**24,675**	**22,812**	**84,638**	**90,115**	**182,847**	**272,962**
129,952	17,014	2,195	1,058,574	67,381	13,921	1,139,876	39,317	31,418	74,282	7,210	4,103	4,220	46,527	35,521	78,502	160,550	43,168	115,567	158,735
131,963	**14,625**	**4,804**	**1,181,466**	**76,310**	**14,538**	**1,272,314**	**57,106**	**40,644**	**36,927**	**8,978**	**4,970**	**1,429**	**66,084**	**45,614**	**38,356**	**150,054**	**58,073**	**155,758**	**213,831**
87,061	20,718	...	654,301	131,862	...	786,163	72,654	24,531	...	14,464	4,722	...	87,118	29,253	...	116,371	36,197	77,236	113,433
107,527	**21,831**	...	**782,122**	**96,254**	**...**	**878,376**	**82,287**	**26,864**	...	**12,219**	**6,040**	...	**94,506**	**32,904**	...	**127,410**	**40,973**	**96,212**	**137,185**
2,546	1,700	...	148,298	12,948	438	161,684	2,366	2,651	2,955	370	136	24	2,736	2,787	2,979	8,502	10,373	8,311	18,684
3,375	**2,117**	...	**159,624**	**12,212**	**554**	**172,390**	**2,245**	**2,477**	**862**	**303**	**99**	**11**	**2,548**	**2,576**	**873**	**5,997**	**5,832**	**19,323**	**25,155**
20,166	2,501	...	175,254	9,887	...	185,141	20,502	5,987	...	1,473	505	...	21,975	6,492	...	28,467	9,128	13,879	23,007
31,414	**2,642**	**657**	**253,508**	**11,597**	**1,465**	**266,570**	**12,073**	**8,632**	**9,423**	**1,511**	**1,034**	**811**	**13,584**	**9,666**	**10,234**	**33,484**	**13,636**	**29,081**	**42,717**
18,868	**2,376**	...	**140,369**	**11,540**	...	**151,909**	**20,588**	**2,712**	...	**2,852**	**623**	...	**23,440**	**3,335**	...	**26,775**	**5,898**	**7,741**	**13,639**
17,717	**3,034**	...	**153,736**	**12,631**	...	**166,367**	**18,551**	**2,899**	...	**2,497**	**848**	...	**21,048**	**3,747**	...	**24,795**	**6,374**	**10,872**	**17,246**
782,584	**82,370**	**32,344**	**5,662,137**	**405,613**	**97,289**	**6,165,039**	**285,729**	**149,111**	**233,908**	**49,468**	**22,194**	**24,501**	**335,197**	**171,305**	**258,409**	**764,911**	**188,030**	**548,680**	**736,710**
841,541	**80,582**	**9,822**	**6,121,756**	**379,116**	**64,451**	**6,565,323**	**295,781**	**167,981**	**140,202**	**53,024**	**26,942**	**10,307**	**348,805**	**194,923**	**150,509**	**694,237**	**331,259**	**795,930**	**1,127,189**

APPENDIX No. IV.

Statement showing the Number of Unclaimed and Refused Letters received at and disposed of by the Dead Letter Offices at Calcutta, Madras, Bombay, Agra, Lahore and Kurrachee during the years 1869-70 *and* 1870-71.

CLASS OF LETTERS.	CALCUTTA.				MADRAS.				BOMBAY.				AGRA.				LAHORE.				KURRACHEE.			
	Number of chargeable letters unclaimed or refused in		Proportion.		Number of chargeable letters unclaimed or refused in		Proportion.		Number of chargeable letters unclaimed or refused in		Proportion.		Number of chargeable letters unclaimed or refused in		Proportion.		Number of chargeable letters unclaimed or refused in		Proportion.		Number of chargeable letters unclaimed or refused in		Proportion.	
	1869-70	1870-71	1869-70	1870-71	1869-70	1870-71	1869-70	1870-71	1869-70	1870-71	1869-70	1870-71	1869-70	1870-71	1869-70	1870-71	1869-70	1870-71	1869-70	1870-71	1869-70	1870-71	1869-70	1870-71
The number of unclaimed paid letters returned to senders	44,106	44,316	57·73	62·28	14,291	15,454	37·87	32·09	40,198	45,256	73·83	71·2	28,261	29,028	66·92	52·06	23,578	28,376	89·77	93·88	Dead letter office not in existence.	2,706	...	86·09
Ditto that cannot be disposed of	32,285	26,832	42·26	37·71	23,440	32,691	62·12	67·90	14,244	18,304	26·16	28·79	13,965	26,727	33·07	47·93	2,684	1,849	10·22	6·11		437	...	13·9
TOTAL ...	76,391	71,148	99·99	99·99	37,731	48,145	99·99	99·99	54,442	63,560	99·99	99·99	42,226	55,755	99·99	99·99	26,262	30,225	99·99	99·99		3,143	...	99·99
The number of unclaimed bearing letters returned to senders	149,137	187,548	41·84	52·37	38,457	23,864	30·24	27·54	155,692	164,550	58·95	63·7	72,417	75,905	23·10	26·8	80,867	70,088	60·88	66·32		3,902	...	49·7
Ditto that cannot be disposed of	207,501	170,516	58·15	47·62	65,806	62,762	69·75	72·45	108,408	96,314	41·04	36·92	240,969	207,219	76·89	73·19	51,972	35,590	39·11	33·67		3,949	...	50·29
TOTAL ...	356,638	358,064	99·99	99·99	104,863	86,626	99·99	99·99	264,100	260,864	99·99	99·99	313,386	283,124	99·99	99·99	132,839	105,678	99·99	99·99		7,851	...	99·99
The number of refused paid letters returned to senders	787	744	72·06	74·4	127	185	9·34	15·17	4,313	3,956	91·55	89·6	1,026	1,249	75·77	66·54	253	502	75·29	80·96		596	...	71·63
Ditto that cannot be disposed of	305	256	27·93	25·6	1,231	1,034	90·65	84·82	398	459	8·44	10·39	328	628	24·22	33·45	83	118	24·70	19·03		236	...	28·36
TOTAL ...	1,092	1,000	99·99	100	1,358	1,219	99·99	99·99	4,711	4,415	99·99	99·99	1,354	1,877	99·99	99·99	336	620	99·99	99·99		832	...	99·99
The number of refused bearing letters returned to senders	82,179	109,128	39·54	40·96	19,218	19,337	28·56	26·89	93,549	99,240	55·11	58·41	72,061	88,735	31·21	34·71	50,888	76,650	60·07	77·25		8,771	...	65·98
Ditto that cannot be disposed of	125,643	157,284	60·45	59·03	48,041	52,566	71·43	73·1	76,174	70,644	44·88	41·58	158,813	166,904	68·78	65·28	33,830	22,563	39·92	22·74		4,521	...	34·01
TOTAL ...	207,822	266,412	99·99	99·99	67,259	71,903	99·99	99·99	169,723	169,884	99·99	99·99	230,874	255,639	99·99	99·99	84,718	99,213	99·99	99·99		13,292	...	99·99
TOTAL NUMBER OF ALL CLASSES OF LETTERS RETURNED TO SENDERS	276,209	341,736	43·02	49·05	72,093	58,840	34·26	28·3	293,752	313,002	59·58	62·76	173,765	194,917	29·55	32·88	155,586	175,616	63·72	74·49		15,975	...	63·59
DITTO THAT CANNOT BE DISPOSED OF ...	365,734	354,888	56·97	50·94	138,318	149,063	65·73	71·69	199,224	185,721	40·41	37·23	414,075	401,478	70·44	67·31	88,569	60,120	36·27	25·5		9,143	...	36·4
TOTAL NUMBER OF LETTERS RECEIVED IN THE DEAD LETTER OFFICES	641,943	696,624	99·99	99·99	210,411	207,893	99·99	99·99	492,976	498,723	99·99	99·99	587,840	596,395	99·99	99·99	244,155	235,736	99·99	99·99		25,118	...	99·99

ABSTRACT.

	1869-70.	1870-71.
The total number of all classes of letters returned to senders	971,405	1,100,086
Ditto that cannot be disposed of	1,205,920	1,160,403
GRAND TOTAL	2,177,325	2,260,489

APPENDIX No. V.

Statement showing the number of Ordinary Postage Labels of each denomination sold in each of the Presidencies and Provinces, with gross value and discount thereof, during the years 1869-70 *and* 1870-71.

Names of Presidencies and Provinces.	8 Pie Labels.	½ Anna Envelopes.	½ Anna Notepaper.	1 Anna Envelopes.	½ Anna Labels.	1 Anna Labels.	2 Anna Labels.	4 Anna Labels.	6 Anna Labels.	6 Anna and 8 Pie Labels.	8 Anna Labels.	Gross Value.	Discount.
	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Rs. A. P.	Rs. A. P.
Bengal	305,687	15,421	18,596	5,514	6,402,079	2,101,854	631,971	682,931	177	34,560	386,324	8,03,053 6 11	34,344 1 11
Madras	182,618	19,152	10,670	3,392	7,683,714	1,088,173	314,387	378,587	...	8,724	106,991	5,08,105 2 4	27,935 15 11
Bombay	309,137	6,628	404	2,161	7,647,800	1,349,551	493,845	380,156	...	19,004	346,508	6,74,569 15 2	28,756 0 3
North-Western Provinces ...	156,908	60,338	3,688	5,231	5,530,720	1,459,581	225,483	372,395	328	9,806	116,566	4,57,171 11 11	26,004 2 0
Punjab	104,191	13,602	68	3,692	3,306,166	508,088	132,099	215,845	...	5,232	90,915	2,58,289 12 11	15,051 3 8
British Burmah	56,093	320	112	688	249,104	159,438	85,553	59,641	6	12,467	61,364	81,628 12 8	4,536 0 6
Central Provinces	25,769	3,768	2,540	945	1,259,982	170,527	63,034	83,879	...	645	19,121	90,069 15 4	4,838 13 10
Sind	30,182	1,712	64	816	1,032,436	113,317	44,906	37,661	...	1,584	23,118	67,970 14 4	4,173 8 6
Total of 1870-71 ...	1,170,585	120,941*	36,142†	22,439‡	33,112,001	6,950,529	1,991,278	2,211,095	511	92,022	1,150,907	29,40,859 11 7	1,45,639 14 7
Total of 1869-70 ...	1,162,264	132,920	756,711	34,814§	30,596,155	6,725,445	1,922,277	2,083,503	88	162,392	1,088,375	28,28,986 10 3	1,38,429 2 2

* Sold at 10 annas per packet of 16 Envelopes.
† Do. at 8 annas do. of 16 Notepaper.
‡ Do. at 1 rupee do. of 16 Envelopes.
§ 7,608. one anna Envelopes sold at 1 rupee 1 anna per packet.

APPENDIX No. VI.

Statement exhibiting the number of Service Postage Labels of each denomination sold in each Presidency and Province, and the gross value thereof, during the years 1869-70 *and* 1870-71.

Names of Presidencies and Provinces.	½ Anna Labels.	1 Anna Labels.	2 Anna Labels.	4 Anna Labels.	8 Anna Labels.	Gross Value.
	Number.	Number.	Number.	Number.	Number.	Rs. A. P.
Bengal	202,847	292,328	104,198	54,826	47,056	74,868 11 6
Madras	250,451	129,171	37,792	21,478	15,699	33,842 12 6
Bombay	477,672	316,304	125,539	66,637	40,630	87,362 14 0
North-Western Provinces	414,204	365,123	120,664	58,480	20,078	75,506 1 0
Punjab	135,269	173,522	69,910	28,226	11,093	36,414 0 6
British Burmah	6,472	12,604	3,443	1,680	419	2,049 14 0
Central Provinces	90,336	69,017	26,139	9,765	1,482	13,586 3 0
Sind	140,298	58,888	18,219	8,315	7,203	16,022 7 0
Total of 1870-71. ...	1,717,549	1,416,957	505,904	249,407	143,660	3,39,652 15 6
Total of 1869-70 ...	921,039	1,034,681	393,347	148,221	36,215	1,97,781 2 6

APPENDIX No. VII.

Statement showing the Correspondence sent to and received from the District Post by the General Post in each Postal Circle during the year 1870-71.

Names of Postal Circles.	Total number sent to District Post.			Number received back from District Post.			Received for despatch from District Post.		
	Letters.	Newspapers.	Parcels.	Letters.	Newspapers.	Parcels.	Letters.	Newspapers.	Parcels.
Bengal	784,436	36,476	5,523	87,755	648	90	586,802	2,271	1,254
Madras	980,590	122,561	15,066	75,868	1,308	226	753,033	16,886	3,796
Bombay	915,184	28,440	4,259	80,223	437	69	286,176	13,652	908
North-Western Provinces	930,249	32,250	3,769	159,410	1,135	101	624,971	2,202	665
Punjab	334,804	10,835	2,755	51,701	708	68	208,177	3,691	222
Central Provinces	164,206	4,415	942	12,107	215	16	163,512	408	312
Sindh	211,425	12,002	2,248	12,075	229	22	173,098	1,948	182
Total ...	4,320,894	246,979	34,562	479,139	4,680	592	2,796,769	41,058	7,339

APPENDIX No. VIII.

Statement showing the Offences committed by Post Office Officials during the year 1870-71.

Names of Postal Circles.	Number of ascertained Cases of Dishonesty on the part of Post Office Officials.		Total.
	Number of Legal Convictions.	Number of Cases Departmentally punished.	
Bengal	6	12	18
Madras	5	9	14
Bombay	26	49	75
North-Western Provinces	26	...	26
Punjab	5	7	12
British Burmah	2	4	6
Central Provinces	1	6	7
Sindh	...	2	2
Total ...	71	89	160

APPENDIX No. IX.

Statement showing the Staff of Officers, Clerks, and others of the Post Office Department in India on the 31st March 1871.

Designation.	Bengal.		Madras.		Bombay.		N.-W. Provinces.		Punjab.		Central Provinces.		British Burmah.		Sindh.		Total.	
	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870-71.
Director General of the Post Office of India ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Deputy Director General of the Post Office ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Personal Assistant to the Director General and Compiler of Post Office Accounts	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Post Masters General and Chief Inspectors exercising the powers of a Post Master General ...	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	8
Inspecting Post Masters, including Supernumerary and Sub-Inspectors	*15	41	15	15	14	14	35	38	17	...	2	2	...	...	3	3	101	133
Post Masters and Deputy Post Masters	557	614	312	321	449	443	448	458	264	269	88	136	8	8	46	55	2,172	2,304
Clerks (English and Vernacular)	496	574	280	293	345	330	295	294	239	257	49	54	26	27	31	33	1,761	1,862
Post Men and other Servants	1,401	1,551	768	804	1,047	920	1,216	1,173	446	552	208	156	40	39	120	86	5,248	5,281
Road Establishment, consisting of Superintendents, Overseers, Mootsuddies, Runners, Bearers, Coachmen, Syces, Boatmen, and others	3,256	3,302	3,758	3,383	2,304	2,274	2,653	2,465	1,906	1,935	1,120	1,215	144	151	396	374	15,537	15,099
Total ...	5,729	6,086	5,134	4,817	4,160	3,982	4,648	4,429	2,875	3,034	1,468	1,564	219	226	597	552	24,330	24,690

* Including one Inspector attached to the Compiler's Office.

APPENDIX No. X.

Comparative Statement showing the Receipts of the Post Office Department for the years 1869-70 *and* 1870-71.

Head of Receipts.	1869-70.	1870-71.	Increase.	Decrease.
Postal Service.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Postage on Letters.				
Bengal	3,10,673 11 0	3,47,022 0 10	36,348 5 10	...
Madras	1,31,723 15 8	1,35,464 3 0	3,740 3 4	...
Bombay	2,89,752 7 8	2,73,292 6 8	...	16,459 0 11
North-Western Provinces	3,85,[illegible] 8	4,15,127 2 6	29,223 9 10	...
Punjab	1,72,950 2 [illegible]	1,73,390 7 [illegible]	440 5 3	...
British Burmah	15,417 7 7	[illegible]48 12 [illegible]	...	768 11 4
Central Provinces	38,371 15 3	61,[illegible]	93,180 12 11	...
Sindh	20,503 8 2	21,232 2 [illegible]	[illegible] 7	...
Total ...	13,65,296 12 1	14,41,730 15 7	93,661 15 [illegible]	[illegible] 3
Postage on Banghy Parcels.				
Bengal	46,668 9 11	65,590 14 6	18,922 4 7	...
Madras	45,257 7 8	51,431 6 5	6,173 14 9	...
Bombay	40,382 12 0	35,210 4 0	...	5,172 8 0
North-Western Provinces	58,740 15 11	1,06,562 10 11	47,821 11 0	...
Punjab	36,321 10 0	44,732 0 6	8,410 6 6	...
British Burmah	5,421 12 8	6,229 2 2	807 5 6	...
Central Provinces	11,629 6 8	23,801 10 4	12,172 3 8	...
Sindh	3,664 6 10	4,802 2 4	1,137 11 6	...
Total ...	2,48,087 1 8	3,38,360 3 2	95,445 9 6	5,172 8 0
Sale of Ordinary Postage Stamps.				
Bengal	7,60,226 4 5	8,03,053 6 11	42,827 2 6	...
Madras	4,90,388 5 8	5,08,105 2 4	17,716 12 8	...
Bombay	6,97,063 1 9	6,74,569 15 2	...	22,493 2 7
North-Western Provinces	4,15,246 15 1	4,57,171 11 11	41,924 12 10	...
Punjab	2,53,869 3 9	2,58,289 12 11	4,420 9 2	...
British Burmah	80,768 0 10	81,628 12 8	860 11 10	...
Central Provinces	63,990 0 1	90,069 15 4	26,079 15 3	...
Sindh	67,434 10 8	67,970 14 4	536 3 8	...
Total ...	28,28,986 10 3	29,40,859 11 7	1,34,366 3 11	22,493 2 7
Deduct—Discount on Sale	1,38,429 2 2	1,45,639 14 7	7,210 12 5	...
Net Amount ...	26,90,557 8 1	27,95,219 13 0	1,27,155 7 6	22,493 2 7
Sale of Service Postage Stamps.				
Bengal	35,058 9 0	74,868 11 6	39,810 2 6	...
Madras	19,085 15 6	33,842 12 6	14,756 13 0	...
Bombay	36,400 11 0	87,362 14 0	50,962 3 0	...
North-Western Provinces	52,265 15 0	75,506 1 0	23,240 2 0	...
Punjab	36,658 3 6	36,414 0 6	...	244 3 0
British Burmah	2,604 11 0	2,049 14 0	...	554 13 0
Central Provinces	10,884 0 6	13,586 3 0	2,702 2 6	...
Sindh	4,823 1 0	16,022 7 0	11,199 6 0	...
Total ...	1,97,781 2 6	3,39,652 15 6	1,42,670 13 0	799 0 0
Official Postage.				
Bengal	6,11,119 1 0	6,04,077 3 4	...	7,041 13 8
Madras	4,27,925 2 0	5,60,604 8 8	1,32,679 6 8	...
Bombay	7,11,895 3 [illegible]	8,17,802 12 11	1,05,907 9 11	...
North-Western Provinces	3,33,991 11 0	8,65,283 14 [illegible]	5,31,292 3 11	...
Punjab	4,69,153 5 0	5,57,684 14 11	88,531 9 11	...
British Burmah	26,189 4 0	21,872 4 3	...	4,316 15 9
Central Provinces	77,234 11 0	3,58,981 14 8	2,81,747 3 8	...
Sindh	32,337 12 0	1,13,163 11 0	80,825 15 0	...
Total ...	26,89,846 1 0	38,99,471 4 8	12,20,984 1 1	11,358 13 5
Steam Postage due by the London Post Office.				
Bengal	6,740 1 0	4,511 10 0	...	2,228 7 0
Madras	2,328 0 6	1,870 8 6	...	457 8 0
Bombay	2,30,102 12 8	2,22,221 0 0	...	7,881 12 8
Total ...	2,39,170 14 2	2,28,603 2 6	...	10,567 11 8

APPENDIX No. X—*continued.*

Head of Receipts.	1869-70.	1870-71.	Increase.	Decrease.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Postal Service—*continued.*				
Miscellaneous.				
Bengal	(a)1,151 10 0 8,436 13 2	10,896 1 2	1,307 10 0	...
Madras	(a)915 8 0 (c)700 4 11	6,589 13 6	...	3,025 15 5
Bombay	796 8 0 64 14 4	13,470 14 2	...	6,790 8 2
North-Western Provinces	9,133 0 2	*7,391 13 6	...	2,989 14 8
Punjab	(a)947 14 0 8,619 12 6	7,007 9 11	...	2,560 0 7
British Burmah	(a)198 8 0 (c)2,499 1 11	2,110 7 6	...	587 2 5
Central Provinces	(a)160 0 0 2,078 10 0	5,759 2 0	3,520 8 0	...
Sindh	(a)259 0 0 939 11 4	1,198 6 5	...	0 4 11
TOTAL ...	67,550 0 4	†56,424 4 2	4,828 2 0	15,953 14 2
Total of Postal Service.				
Bengal	17,80,074 11 6	19,10,020 0 3	1,29,945 4 9	...
Madras	11,26,324 11 11	12,97,908 6 11	1,71,583 11 0	...
Bombay	20,27,858 6 4	21,25,931 2 11	98,072 12 7	...
North-Western Provinces	12,56,530 13 10	19,27,043 6 9	6,70,512 8 11	...
Punjab	9,78,520 2 11	10,77,518 14 2	98,998 11 3	...
British Burmah	1,33,098 14 0	1,28,539 4 10	...	4,559 9 2
Central Provinces	2,04,348 11 6	5,53,751 9 6	3,49,402 14 0	...
Sindh	1,29,962 2 0	2,24,389 11 10	94,427 9 10	...
TOTAL ...	76,36,718 10 0	92,45,102 9 2	16,12,943 8 4	4,559 9 2
DEDUCT—Discount on Sale of Postage Stamps	1,38,429 2 2	1,45,639 14 7	7,210 12 5	...
NET AMOUNT ...	74,98,289 7 10	90,99,462 10 7	16,05,732 11 11	4,559 9 2
Deduct Amount due to the London Post Office				
Bengal	2,19,219 2 2	3,61,824 3 10	1,42,605 1 8	
Madras	40,862 12 0	62,651 2 4	21,788 6 4	
Bombay	4,22,197 0 4	6,92,091 11 10	2,69,894 11 6	
TOTAL ...	6,82,278 14 6	11,16,567 2 0	4,34,288 3 6	
Net Amount.				
Bengal	15,60,855 9 4	15,48,195 12 5	...	12,659 12 11
Madras	10,85,461 15 11	12,35,257 4 7	1,49,795 4 8	...
Bombay	16,05,661 6 0	14,33,839 7 1	...	1,71,821 14 11
North-Western Provinces	12,56,530 13 10	19,27,043 6 9	6,70,512 8 11	...
Punjab	9,78,520 2 11	10,77,518 14 2	98,998 11 3	...
British Burmah	1,33,098 14 0	1,28,539 4 10	...	4,559 9 2
Central Provinces	2,04,348 11 6	5,53,751 9 6	3,49,402 14 0	...
Sindh	1,29,962 2 0	2,24,389 11 10	94,427 9 10	...
GRAND TOTAL ...	69,54,439 11 6	81,28,535 7 2	13,63,137 0 8	1,89,041 5 0
DEDUCT—Discount on Sale of Postage Stamps	1,38,429 2 2	1,45,639 14 7	7,210 12 5	...
NET AMOUNT ...	68,16,010 9 4	79,82,895 8 7	13,55,926 4 3	1,89,041 5 0

(a) Sale proceeds of the Indian Postal Guide.
(b) Including Rs. 5,578 4 0 on account of passage money in Dâk Boats.
(c) Ditto 124 0 0 ditto ditto.
* Including Rs. 4-3-6 on account of Camel Dâk.
† Including sale proceeds of the Indian Postal Guide and passage money in Dâk Boats, as follows:—

	Sale of Postal Guide.	Passage money in Dâk Boats.
Bengal ...	335 13 0	490 15 0
Madras ...	138 4 0	...
Bombay ...	64 8 0	7,186 8 0
N.-W. Provinces	216 8 0	4 3 6
Punjab ...	159 6 0	...
British Burmah	56 4 0	...
Central Provinces	41 8 0	111 0 0
Sindh ...	28 12 0	...
TOTAL ...	1,040 15 0	7,792 10 6

APPENDIX No. X—*continued.*

Head of Receipts.	1869-70.	1870-71.	Increase.	Decrease.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Non-Postal Branches.				
Bullock Train.				
Bengal	4 2 0 (a) 31,10[illegible] 2,09,168 8	*1,57,369 7 5	...	82,953 3 6
North-Western Provinces ...	(a) 14,017 5 2,66,783 9	38,067 12 10	...	64,733 2 1
Punjab	(a) 36,110 4,44,907 8	311 2 8	...	89,706 6 7
British Burmah	400 0 0	...	...	400 0 0
Central Provinces	(a) 946 10 0 22,761 11 0	5,762 2 10	...	17,946 2 2
TOTAL ...	10,48,249 8 1	7,92,510 9 9	...	2,55,738 14 4
Military Van Dâk.				
Punjab	2,56,505 10 3	2,14,942 4 8	...	41,563 5 7
Passenger Service.				
Bengal	29,893 11 6	34,558 11 0	4,664 15 6	...
Madras	911 9 6	706 7 0	...	205 2 6
Bombay	12,174 3 0	10,360 9 6	...	1,813 9 6
North-Western Provinces... ...	20,418 10 6	16,330 15 3	...	4,087 11 3
Punjab	15,167 11 0	§28,057 7 3	12,889 12 3	...
Central Provinces	78,630 15 0	3,378 4 6	...	75,252 10 6
TOTAL ...	1,57,196 12 6	93,392 6 6	17,554 11 9	81,359 1 9
Total of Non-Postal Branches.				
Bengal	2,70,216 6 5	1,91,928 2 5	...	78,288 4 0
Madras	911 9 6	706 7 0	...	205 2 6
Bombay	12,174 3 0	10,360 9 6	...	1,813 9 6
North Western Provinces	3,23,219 9 5	2,54,398 12 1	...	68,820 13 4
Punjab	7,52,690 14 6	6,34,310 14 7	...	1,18,379 15 11
British Burmah	400 0 0	...	...	400 0 0
Central Provinces	1,02,339 4 0	9,140 7 4	...	93,198 12 8
GRAND TOTAL ...	14,61,951 14 10	11,00,845 4 11	...	3,61,106 9 11

(a) On account of Service Packages due from the Military Department at the close of March 1870. Receipts to the like extent deducted from the collections in 1870-71.

		Rs.	A.	P.
* Including	...	27,603	5	6
† ,,	...	19,023	2	6
‡ ,,	...	25,027	1	11
TOTAL	...	71,653	9	11

on account of Service Packages due from the Military Department at the close of March 1871.

§ Including Rs. 10,000 on account of contributions from the Bhawulpore State.

APPENDIX No. X—*continued.*

Comparative Statement shewing the Charges of the Post Office Department for the years 1869-70 *and* 1870-71.

Head of Charges.	1869-70.	1870-71.	Increase.	Decrease.
Postal Service.				
Salaries and Establishment.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Director General of Post Office	68,962 15 6	76,460 12 0	7,497 12 6	...
Compiler of Post Office Accounts	56,475 14 2	57,620 [illegible] 1	1,404 1 11	...
Bengal	6,29,518 14 3	6,35,794 6 8	6,275 8 5	...
Madras	6,996 [illegible]	6,92,230 3 0	66,133 12 3	...
Bombay	7,56,595 10 2	7,09,885 1 7	...	48,710 8 7
N. W. Provinces	6,19,049 3 4	7,05,165 4 4	86,116 1 0	...
Punjab	3,26,108 3 5	3,45,683 7 11	19,575 4 6	...
British Burmah	77,245 6 8	79,356 5 8	2,110 15 0	...
Central Provinces	1,47,681 2 2	2,05,217 12 1	57,536 9 11	...
Sindh	70,543 8 2	79,556 9 5	9,013 1 3	...
Total ...	35,50,017 4 7	37,56,969 14 9	2,55,663 2 9	48,710 8 7
Miscellaneous and Contingent Charges.				
Director General of Post Office	6,843 7 8	9,309 8 5	2,466 0 9	...
Compiler of Post Office Accounts	1,408 2 5	2,441 15 5	1,033 13 0	...
Bengal	(a) 261 7 2 (c) 2,19,195 11 9	(b) 2 4 0 (a) 131 13 0 (g) 1,59,445 4 6	...	59,877 13 5
Madras	(a) 2 6 8 79,229 1 1	(a) 6 9 7 (b) 106 6 8 64,408 9 10	...	14,709 13 8
Bombay	(d) 2,21,701 7 5	(b) 523 9 4 (f) 1,76,599 15 10	...	44,577 14 8
N. W. Provinces	(a) 117 11 0 62,832 10 4	(a) 7 0 0 (b) 10 11 0 85,755 15 5	22,823 5 1	...
Punjab	(a) 2 14 5 54,262 2 11	60,757 7 3	6,492 5 11	...
British Burmah	7,443 4 7	(a) 269 14 0 4,276 11 8	...	2,896 10 11
Central Provinces	(e) 26,265 15 1	(a) 50 14 0 24,703 5 3	...	1,511 11 10
Sindh	9,944 7 8	(a) 125 15 8 10,489 4 6	670 12 6	...
Total ...	6,89,510 14 2	(h) 5,99,423 3 4	33,486 5 3	1,23,574 0 1
Mail Cart (after deducting charges for Passenger Service.)				
Bengal	47,927 12 8	62,022 11 3	14,094 14 7	...
Madras	1,62,773 0 5	1,36,109 5 6	...	26,663 10 11
Bombay	2,79,454 5 9	1,59,464 1 2	...	1,19,990 4 7
N. W. Provinces	2,90,320 10 2	1,69,190 14 9	...	1,21,129 11 5
Punjab	1,63,963 8 8	1,33,940 1 8	...	30,023 7 0
Central Provinces	2,74,394 9 9	39,751 6 6	...	2,34,643 3 3
Sindh	1,06,538 10 5	1,03,253 4 4	...	3,285 6 1
Total ...	13,25,372 9 10	8,03,731 13 2	14,094 14 7	5,35,735 11 3
Bounty Money.				
Bengal	71 2 0	9 1 0	...	62 1 0
Madras	516 11 0	698 8 0	181 13 0	...
Bombay	1,337 4 0	922 3 0	...	415 1 0
British Burmah	1,328 1 0	695 15 0	...	632 2 0
Sindh	31 5 0	54 6 0	23 1 0	...
Total ...	3,284 7 0	2,380 1 0	204 14 0	1,109 4 0

(a) On account of Law Charges.
(b) Profit and loss.
(c) Including Rs. 1,00,464-12-0 on account of haulage for sorting carriages and Rs. 3 being postage collections of the Goh Post Office stolen by robbers and written off to profit and loss under orders of Government No. 3137, dated 23rd October 1868.
(d) Including Rs. 7,157-10-6 on account of special trains.
(e) Including Rs. 651-12-0 ditto ditto.
(f) Including Rs. 16,658-3-8 ditto ditto.
(g) Including Rs. 43,116-2-8 on account of haulage of sorting carriages exclusive of Rs. 58,770-5-4 due by the East Indian Railway Company.
(h) Including Rs. 68,050-13-3 on account of printing charges, as follows :—

Bengal.	Madras.	Bombay.	N. W. Provinces.	Punjab.	British Burmah.	Central Provinces	Sindh.
361-11-0.	1,494-15-7	13,028-6-3	24,360-6-4	24,865-4-5	73-0-0	480-0-0	3,387-1-8.