

REPORT

TO

THE SECRETARY OF STATE FOR INDIA IN COUNCIL

ON

RAILWAYS IN INDIA,

FOR THE YEAR

1870-71.

BY JULAND DANVERS, ESQ.,

GOVERNMENT DIRECTOR OF THE INDIAN RAILWAY COMPANIES.

Presented to both Houses of Parliament by Command of Her Majesty.



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REPORT.

To His Grace the DUKE OF ARGYLL, K.T., Secretary of State for India.

MY LORD DUKE,

India Office, 1st June 1871.

I HAVE the honour to lay before your Grace the following report on Railways in India for the year 1870-71.

2. At the commencement of the year 1870 a length of 4,283 miles of Railway was open. During the year 557 miles were added. Since the beginning of the present year a further extent of 211 miles has been finished; so that at the present time the total length of Railway open in India is 5,051 miles, of which 710 are constructed with a double line. Progress during year 1870.

3. The most important section completed during the year was that from Sohagpore to Jubbulpore on the Great Indian Peninsula line, by means of which railway communication between Bombay and Calcutta was established, but the opening having taken place early in March was mentioned in my report of last year. Next in importance to this event in the railway annals of the year was the completion of the whole length of Railway between Calcutta and Lahore by the opening of the last remaining section on the Delhi and Punjab line.

4. Since the end of the year, the lines from Bombay in a south-easterly direction, and from Madras in a north-westerly direction, have met at Raichore, the point of junction fixed upon, and a train service has been established between those two presidencies. (Thus may the system of trunk lines for India, originally laid down by Lord Dalhousie, be regarded as completed.) The three presidency towns are united, and the north-west frontier has been brought into railway communication with the southern portion of the peninsula. Commencing at Negapatam, the most southern terminus of the present Madras system, and proceeding by Bombay, Jubbulpore, Allahabad, and Lahore, to Moulton, on the Indus, a continuous length of about 2,800 miles of railway has been formed. The extension line of the Eastern Bengal Railway, which terminates at Goalundo, at the confluence of the Ganges and Brahmapootra rivers, was opened by the Viceroy on the last day of the year. It will form a valuable addition to the original line, as much of the up-country traffic which formerly went on these rivers will now flow to the railway. Since the end of last year the chord line of the East Indian Railway has also been opened for traffic. A saving of 65 miles in the journeys from Calcutta to the north-west and to Bombay is effected by this route, and great facilities are given for making the coal of the districts through which the line passes available for this and other railways in Upper India.

Completion of Lord Dalhousie's system of trunk lines.

5. The following statement furnishes particulars as to the length of each undertaking, and its progress towards completion : Length of lines.

Railway.	Gauge.	Length sanctioned.	Length opened during 1870.	Length opened since Dec. 1870.	Total Length opened.	Portion laid with Double Line.	Length remaining to be finished.
Guaranteed.	East Indian { Main line Jubbulpore line }	5' 6" { 1,278	—	147	1,278	390	—
		5' 6" { 224	—	—	224	—	—
	Great Indian Peninsula	5' 6" 1,272	385	15	1,272	237	—
	Madras	5' 6" 862	76	49	832	—	30
	Bombay, Baroda and Central India	5' 6" 391	—	—	312	18½	72
	Scinde, Punjab and Delhi	5' 6" 674	43	—	674	5	—
	Great Southern of India	5' 6" 378	—	—	168	—	210
	Eastern Bengal	5' 6" 159	45	—	159	—	—
	Oude and Rohilkund	5' 6" 738	—	—	42	—	679
Carnatic	3' 3½" 100	—	—	19	—	81	
Unguaranteed.	Nulhuttee	4' 0" 27½	—	—	27½	—	—
	Calcutta and South-eastern	5' 6" 28	—	—	28	—	—
		5' 6" 8	—	—	8	—	—
	Khamgaon	5' 6" 7½	7½	—	7½	—	—
	Oomrawuttee	5' 6" 116	—	—	—	—	116
	Goolburga to Hyderabad	5' 6" 270	—	—	—	—	270
	Punjab Northern	3' 3½" 500	—	—	—	—	500
	Indus Valley	3' 3½" 370	—	—	—	—	370
	Rajpootana	3' 3½" 84	—	—	—	—	84
Indore to Khundwa	3' 3½" —	—	—	—	—	—	
Total	—	7,432	556½	211	5,051	709½	2,431

- Progress on State lines. 6. Much progress has not at present been made on what are termed the State lines, viz., those which the Government of India has determined to construct under its own immediate supervision, without the intervention of companies. A small branch from the Great Indian Peninsula Railway to the cotton mart of Oomrawuttee, of $7\frac{1}{2}$ miles in length, has been opened, making the second line of this description which has been constructed by Government in the Central Provinces; but the line from Lahore towards Peshawur has not been advanced beyond laying it out as far as Jhelum, a distance of 102 miles. Delay in proceeding with the works in this undertaking has been occasioned by the proposal to alter the designs, which had been prepared for the standard gauge, and to adapt them to the narrow gauge. Now that this question has been settled in the affirmative, new plans are being made, and operations will commence in earnest. It is estimated that 200,000*l.* will be expended on this line during the present year. The total cost of the whole, which is 270 miles in length, will be about 3,000,000*l.*
- Oomrawuttee.
- Punjab Northern.
- Indus Valley. 7. The Indus Valley Railway is also to be constructed on the narrow gauge. Its northern portion has been laid out, and is about to be commenced. This starts from a point six miles west of Moultan on the Punjab Railway, and runs through Shoojabad and Bhawalpore to Sukker. The lower division extends from that place to Kotree, and is beset with difficulties arising from inundations. A committee is investigating the route on either side of the river, and will report which they consider to be the more favorable for the construction of a railway.
- Rajpootana. 8. With regard to the projected railways in Rajpootana, lines have been surveyed from Agra to Ajmeer, via Jeypoor and Sambhur, 236 miles, and from Delhi via Rewaree and Tellour, 125 miles, to join the above, with a branch of eight miles to the Salt Works. Operations have commenced on the line between Delhi and Rewaree, which will involve an outlay of 50,000*l.* during the present year. The line to Ajmeer will probably be taken, ultimately, on to Indore, from which place to Khundwa, on the Great Indian Peninsula Railway, a line, 84 miles in length, has been laid out. A treaty has been made between the British Government and the Maharajah of Jeypore for the lease of the Sambhur Salt Lake, by which the British Government will have the exclusive right to manufacture and sell salt there.
- Indore.
- Carwar to Hooblee. 9. The line from Carwar to Hooblee, south of Bombay, is still under consideration. The difficulties of this scheme, and the expensive nature of the works over the ghâts, made it necessary to survey the ground afresh. More favorable gradients and easier works than were originally contemplated have now been found practicable.
- Goolburga to Hyderabad. 10. The railway from Goolburga, on the Great Indian Peninsula, to Hyderabad, which is to be constructed with funds provided by the Nizam, has been laid out and commenced. It will be about 116 miles in length, and will go by Secunderabad and Trimulgherry. At the particular desire of the Nizam this line will be constructed on the broad gauge.
- Gauge. 11. I may here mention that the important question of gauge has occupied much attention during the past year. The present width of 5 feet 6 inches was fixed upon by the home authorities, when Indian railways were first commenced, in the year 1859. Lord Dalhousie was in favour of 6 feet; but after much consideration 5 feet 6 inches was decided upon as preferable. Since that time the introduction of a lighter system of railways into India has more than once been proposed. Colonel H. Yule, R.E., C.B., strongly advocated it some years ago, and the Indian Branch Railway Company constructed two short lines of this description, both on the broad and narrow gauge, Mr. Wilson being their engineer. The recommendation that a much narrower gauge than 5 feet 6 inches should at once be applied to future lines of railway in India was made by the present Viceroy last year. The chief ground upon which Lord Mayo came to this conclusion was economy. He and the members of his Council considered that the railway system of India was really in its infancy; that its extension to any great length upon the existing mode of construction would be greatly retarded by the necessary outlay; that saving of cost in every direction was imperatively called for, and that such saving could be most satisfactorily secured by adopting a narrow gauge. The Government of India regarded 3 feet 6 inches as the maximum that should be used, but begged that this point should be determined in England.
- Gauge committee. 12. A committee, consisting of Colonel R. Strachey, R.E., C.S.I., Colonel C. H. Dickens, R.A., C.S.I., Mr. John Fowler, C.E., and Mr. A. M. Rendel, Consulting Engineer to the East Indian Railway Company, was accordingly appointed "to consider the precise gauge and general character for an average

narrow gauge line of railway in India." The result of their investigations and deliberations was given in two reports, one containing the conclusions at which all the members of the committee, excepting Mr. Fowler, had arrived, the other expressing that gentleman's opinion alone. All, including Mr. Fowler, were in favour, on the ground of economy, of introducing a narrower gauge into India than the present standard of 5 feet 6 inches in districts where a break of gauge would not be productive of serious inconvenience, but they differed as to what that gauge should be. Colonel Strachey, Colonel Dickens, and Mr. Rendel recommended 2 feet 9 inches; Mr. Fowler, 3 feet 6 inches. The opinion of the former was founded upon the conviction that "to obtain the greatest economy in construction, and, consequently, the greatest possible extension of railways in India, the gauge selected should be not only narrow, but the narrowest which would combine convenience of transport for various kinds of goods and passengers with reasonable speed, and with economy and safety in working;" and they were persuaded that these conditions would be fulfilled by a 2 feet 9-inch gauge. Mr. Fowler, on the other hand, was of opinion that a width of 3 feet 6 inches should be adopted, "on the clear ground that it was not greater in first cost of works and rolling stock than a gauge of 2 feet 9 inches, and was greatly superior in carrying capacity, convenience, and economical working." The other members of the committee considered that the cost of a railway was in proportion to its gauge; he did not. He felt that to secure the greatest simplicity and economy of construction and working in a locomotive a gauge of 3 feet 6 inches was required. They thought that engines of sufficient power might be put on a 2 feet 9-inch gauge to draw at a sufficient speed the largest traffic which the lines for which a narrow gauge is suitable are likely to carry. The same differences of opinion on similar grounds are expressed in regard to the rolling stock of the respective gauges. Opinions were also given on the subject by Mr. John Hawkshaw, as Consulting Engineer to the Madras and the Eastern Bengal Railways, and by Mr. G. P. Bidder, as Consulting Engineer to the Scinde, Punjab and Delhi Railway. They are both opposed to the application of any other than the existing gauge to future lines, which may be required as branches to or extensions of the systems of railway with which they are connected. They attach great importance to the evils and inconveniences of a break of gauge, and contend that the very small saving, if any, which might be secured by the adoption of a narrow gauge would be more than counterbalanced by those disadvantages. Mr. Hawkshaw, however, admits, in the early part of his report, that if "it were a well-ascertained fact that there are districts in India where, having regard to financial reasons, a railway on a narrower gauge could be made, but where a railway on the existing gauge could not and ought not to be made, then that would be a case in which a narrow gauge might be considered as an absolute necessity." He calculates, upon certain assumptions, that the difference in the first cost of a heavy railway on the 5 feet 6-inch and a light railway on the 3 feet 6-inch gauge would be 1,810*l.* per mile, and that the saving in maintenance and renewals of permanent way would be 50*l.* per mile per annum, or, if capitalised at 20 years' purchase, 1,000*l.* He considers, however, that the object of economy would be best attained by constructing a lighter system of railway on the existing gauge, and calculates that by this means 1,250*l.* per mile might be saved in the first cost, and 40*l.* per annum in maintenance, or 800*l.* capitalised. Thus, under the least favorable view of the case, a saving of about 800*l.* per mile is admitted. The case above described in Mr. Hawkshaw's words would probably be regarded as the rule, instead of the exception, for future lines in India. If ten thousand miles are to be laid out, economy must be observed in the construction of every mile, and a saving of 800,000*l.* in every thousand miles, or of 8,000,000*l.* in ten thousand miles, becomes a matter of importance.

13. A much greater saving, however, is expected by the advocates of the narrow gauge. I may mention, in passing, that the estimates for the Carnatic Railway, on the broad and narrow gauge systems, made by Mr. C. Douglas Fox, the Consulting Engineer to that company, show a saving of 1,700*l.* per mile in favour of the latter. The same capital would thus make 112 miles of the 5 feet 6 inches, or 151 miles of 3 feet 3 inches. I am informed also that in America 80 miles of a line which is to be 850 miles in length has been laid on a 3 feet gauge, at a cost of 2,500*l.* per mile, including rolling stock, the rail being 30 lbs. to the yard, joined by fish plates, the sleepers pine wood, 5 feet long, set 2 feet 6 inches apart.

14. The existence of another gauge in the country necessarily complicates the

question of introducing the narrow one; and in some places and situations the inconveniences of a break of gauge may be so great, or the value of a line of communication for strategical purposes may be so impaired by it, as to make it worth while to pay the difference in cost; but, under ordinary circumstances, these kinds of difficulties may be greatly reduced by improved mechanical appliances and good traffic arrangements. The condition of things, moreover, in this country, where, within short distances, and with an immense traffic, a break of gauge has been found to be most burdensome and objectionable, is very different from that of India.

14. All the opinions above mentioned were on the 26th October last transmitted to the Government of India, with a despatch to H.E. the Governor General in Council, in which were weighed the advantages and disadvantages, on political and economic grounds, of the application of a narrow gauge to future railways, especially to the cases of the Punjab Northern and the Indus Valley lines, and after commending to his investigation certain points of a local and technical character which would bear upon the question, the decision was left in the hands of the Government of India. That Government has since decided that the future narrow gauge for Indian railways shall be a metre or 3 feet $3\frac{3}{8}$ inches, this being in its opinion most convenient as respects the width of vehicle which can be run on it, and one which, while equal to the present requirements of the traffic with light rails and rolling stock, may be readily adapted in case of an important increase of traffic for larger vehicles and heavier engines. The Government determined also that it should be adopted for the Punjab Northern and Indus Valley lines as well as for the Rajpootana and Indore Railways.

Dates at which the right of purchase by the Government may be exercised.

15. It was mentioned in my last report that certain modifications had been made in the original contracts with many of the Railway Companies, the chief object being to arrange in future for the equal division of surplus profits, that is, of profits above the rate of guaranteed interest, between the Government and the Companies so long as the railways remained in the hands of the Companies. Under most of the former contracts power was given to the Government to purchase the railways upon terms specified on the 25th and 50th year after the dates of the respective contracts. The dates at which the first opportunity of purchase was fixed have in some cases been altered, and in others the right of purchase at the end of the first 25 years has been given up by the Government. The position in which each company now stands in this respect will be seen by the subjoined list.

16. Dates when the right of purchase can first be exercised by Government in the case of the several guaranteed Indian railways:

East Indian, main line	-	-	15 February 1879.
" Jubbulpore line	-	-	21 April 1883.
Great Indian Peninsula	-	-	17 August 1899.
Madras	-	-	1 April 1907.
Bombay, Baroda and Central India	-	-	1 May 1905.
Scinde, Punjab and Delhi	-	-	1 January 1885.
Easter Bengal	-	-	30 July 1883.
Great Southern of India	-	-	1 January 1899.
Oude and Rohilkund	-	-	2 August 1887.
Carnatic	-	-	1 March 1890.

Dates of purchase.

17. It is well known that under the contracts the purchase money, the amount of which is to be regulated by the average price of the stock of the railway sold during the three preceding years, may be paid either in a lump sum or in the shape of an annuity, payable half yearly in London, "to be reckoned from the time when the gross amount would be payable, and to continue during the residue of the term of 99 years; the rate of interest which shall be used in calculating such annuity being determined by the average rate of interest during the preceding two years received in London upon public obligations of the E.I. Company, and other public obligations in London by the Secretary of State in Council, and which shall be ascertained by reference to the Governor and Deputy Governor of the Bank of England for the time being." Should the railways be purchased under the operation of the clauses which either enable or require the Government to take them over, the authorities will of course be guided by the circumstances existing at the time as to which is the preferable mode of payment; but it would seem probable that the conversion of the capital into an annuity would be the course followed. In the cases of the Oude and Rohilkund and Carnatic Companies, in lieu of the option of paying by means of an annuity, the Government has the power of transferring to them Government of India 5 per cent. stock, redeemable at par, instead of making a cash payment.

18. As intimately connected with railway communication at Calcutta, it may be mentioned that the crossing of the Hooghly at Calcutta by a floating bridge has been determined on. It is estimated to cost 180,000*l.*, and has been placed in the hands of its projector, Mr. Leslie, late Chief Engineer of the Eastern Bengal Railway, who is preparing the materials for its construction in this country.

Floating bridge
Calcutta.

19. In giving an account of the progress of railway works in India allusion may properly be made to any improvements in the means of communication with India. Last year I had to allude to the opening of the Suez Canal. This year the completion of the tunnel under Mount Cenis is an event which cannot be overlooked in regard to its effect upon the future journey to India. It will promote the establishment of a route which will reduce the sea passage from six days (by Marseilles) to three (by Brindisi) and effect a saving in time of many hours.

Mont Cenis tunnel

PERSONS EMPLOYED ON THE RAILWAYS.

20. It will be seen by the subjoined tables that the number of persons employed in the management and maintenance of 4,599 miles of railway on the 30th of September last was 69,233, or about 15 per mile; of these 5,048 were Europeans and East Indians, and 64,185 were natives. By another return the average number of Europeans and East Indians during the year ending the 30th June 1870 is given at 5,572, of which 3,865 were Europeans, and 1,707 were East Indians. The number of stations open when the census of the 30th September was taken was 477; so that the number of Europeans was 10.58 per station, and 1.09 per mile, and the number of natives 134.5 per station, and 13.9 per mile. The number per mile employed on the East Indian is rather in excess of the average, being 16.4; the number on the Great Indian Peninsula is 18; on the Bombay, Baroda, and Central India 15; and on the Madras 10.

European and
Native servants.

21. There were 48 deaths amongst Europeans, and 11 amongst East Indians. Of the Europeans 456 and of the East Indians 183 resigned or did not renew their engagements; 317 Europeans and 62 East Indians were dismissed. The per-centage of casualties by death amongst Europeans in Bengal (including the Punjab) was 1.2, in Madras 2, in Bombay 1.1, being an average of 1.2 for the whole of India. The per-centage of Europeans who resigned was in Bengal 10.8, in Madras 10.2, in Bombay 13.9, or an average of 11.8. The per-centage of Europeans dismissed was in Bengal 9.5, in Madras 4.9, in Bombay 6.6, or an average of 8.2 for the three Presidencies. It would thus appear that, exclusive of deaths, the changes in the European staff of the railways were last year at the rate of 20 per cent. per annum.

Casualties.

22. Upon this fact, Major Williams, R.E., the Secretary to the Government of India in the Railway Department, makes the following remark:—"There are special difficulties in this country (India) in maintaining a permanent staff, on lines with a fluctuating traffic, that shall be at all times efficient, and yet moderate in cost. If these returns establish that the Railway Companies may depend on the local supply for the chief part of their staff, they also establish that the European portion of that supply is being constantly changed. It is scarcely necessary to dwell upon the serious risk to safe working that this implies."

The following table exhibits the average number of EUROPEANS and EAST INDIANS employed on the RAILWAYS in INDIA, in the TRAFFIC, LOCOMOTIVE, and GENERAL DEPARTMENTS during the half-year ending 30th June 1870, with the reductions in the same from various causes.

Railways in	Average Number of Servants.		Total.	Percentage of Reduction by						Percentage of Losses of all kinds.		Number who died.		Number who resigned.		Number dismissed.		Total.	
	Europeans.	East Indians.		Death.	Resignation or Discharge.		Dismissed.	Europeans.	East Indians.	Europeans.	East Indians.	Europeans.	East Indians.	Europeans.	East Indians.	Europeans.	East Indians.	Europeans.	East Indians.
					Europeans.	East Indians.													
Bengal and N. W. P.	2,290	782	3,072	1.2	4	10.8	12	0.5	2.7	21.5	13.1	28	3	248	94	218	21	44	118
Madras	804	616	1,420	2	1.3	10.2	5.8	4.9	2.3	17.1	9.6	6	7	31	30	15	12	52	49
Bombay	1,271	409	1,680	1.1	0.2	13.9	14.4	6.6	7.1	21.6	21.7	14	1	117	59	84	20	27.5	69
All India	3,865	1,707	5,572	1.4	0.6	11.6	10.7	7	4	20.1	15.4	46	11	456	183	317	62	821	266

ABSTRACT RETURN of Persons employed in the various Departments of the Indian Railways on the 30th September 1870.

Railways.	Agent's Department, including Medical and Barrack Departments.			Account Department.			Audit Department.			Printing and Stationery Department.			Stores Department.			Traffic Department, including Steam Ferry.			Engineer's Department.			Carriage and Wagon Departments.			Locomotive Department.			Telegraph Department.			Grand Total.			No. of Miles open.	No. of Stations.
	Europeans and East Indians.	Natives.	Total.	Europeans and East Indians.	Natives.	Total.	Europeans and East Indians.	Natives.	Total.	Europeans and East Indians.	Natives.	Total.	Europeans and East Indians.	Natives.	Total.	Europeans and East Indians.	Natives.	Total.	Europeans and East Indians.	Natives.	Total.	Europeans and East Indians.	Natives.	Total.	Europeans and East Indians.	Natives.	Total.	Europeans and East Indians.	Natives.	Total.					
	GUARANTEED.																																		
East Indian	30	182	212	18	405	423	31	377	408	8	271	279	39	948	987	318	4,132	4,650	108	7,107	7,370	128	3,351	3,479	819	2,858	3,375	61	1,121	1,182	1,755	20,510	22,285	1,354	130
Great Indian Peninsula	32	232	264	—	—	—	—	—	—	—	—	—	20	288	314	318	3,263	3,578	318	10,710	11,038	—	—	—	546	5,411	5,957	16	48	64	1,264	19,951	21,265	1,184	107
Madras	29	220	249	—	—	—	—	—	—	—	—	—	10	93	103	159	1,478	1,637	74	2,698	2,772	—	—	—	398	1,946	2,347	42	111	153	712	6,549	7,267	707	68
Bombay, Baroda, and Central India.	12	80	92	—	—	—	—	—	—	—	—	—	10	10	20	41	563	604	31	2,809	2,729	—	—	—	204	970	1,174	14	101	115	312	4,422	4,734	312	51
Scinde, Punjab and Delhi	49	823	872	28	43	71	24	64	88	1	131	132	10	175	191	211	1,570	1,831	84	694	768	—	—	—	189	2,016	2,205	—	—	—	602	5,026	6,228	671	56
Great Southern of India	20	107	127	—	—	—	—	—	—	—	—	—	—	—	—	20	223	273	31	688	719	—	—	—	63	515	578	—	—	—	134	1,503	1,637	169	22
Eastern Bengal	8	53	61	4	70	74	1	21	22	—	24	24	4	27	31	65	1,043	1,108	64	2,837	2,901	5	104	109	47	314	361	3	92	95	201	4,945	4,946	113	26
Oude and Rohilkund	13	20	48	10	60	70	1	5	6	7	60	67	—	—	—	5	108	113	6	75	81	—	—	—	18	275	284	2	14	3	62	607	669	42	5
Carnatic	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	1	18	19	1	52	53	—	—	—	2	10	12	—	—	—	4	23	27	19	4
STATE.																																			
Calcutta & South-Eastern	2	—	2	—	5	5	—	1	1	—	1	1	—	1	1	4	51	55	2	139	141	—	6	6	4	19	23	—	6	6	19	220	241	23	8
Total	260	1,727	1,927	60	683	643	57	463	525	10	487	503	108	1,545	1,650	1,340	12,578	13,918	714	27,768	28,402	133	3,621	3,654	2,265	10,035	16,320	138	1,493	1,631	5,048	64,185	69,233	4,594	477

23. Efforts are being made by the Companies and the Government to bring the European staff to the lowest practicable limit. One of the hindrances to Indian railway enterprise is the necessarily expensive nature of that portion of the working staff which is filled by Europeans. To train and educate natives to perform the duties now allotted to Europeans is an important object to keep in view in connexion with the subject of economical reform. In Madras considerable success has already attended the measures that have been taken for that purpose. The system of apprenticeship has answered very well there. As a rule, the youths have remained in the service of the Companies after the expiration of their term of apprenticeship. The same plan has been adopted in Bombay, and the results are encouraging there also.

Reduction of
European staff.

ACCIDENTS.

24. Although there have been several accidents of a serious nature during the year 1870, the general results compare favorably with the year 1869 and most other previous years. The number of passengers killed and injured in 1870 were 13 and 63 respectively, as against 48 and 92 in 1869; the proportion of those who suffered from causes beyond their control being in 1870 2.53 per million instead of 6.66, and of those who were killed by their own misconduct or incaution 1.65 in 1870, in place of 1.81 per million in 1869. As respects the servants employed on the railways, 113 lost their lives, 13 from causes beyond and 100 from causes within their control; 134 also were injured, 114 from causes which might have been avoided. To complete the list of casualties, the number of trespassers has to be added. Of these, 78 were killed and 27 injured. A further class in the list of mortality has to be mentioned, and that is deaths in trains or at stations, of which 114 occurred in 1870. These cases, as described in the returns, show that the deaths occur under various circumstances and at all seasons, but that all may be attributed to natural causes, such as heat apoplexy, exhaustion, cholera, which no arrangements on the railways could altogether prevent.

Accidents.

Passengers.

Servants.

25. The most serious accident of the year occurred on the Madras Railway, which hitherto had been exempt from any fatal accident to passengers. On the night of the 20th October a portion of the bridge which crosses the Cheyair river, on the road to Cuddapah, was washed away, and the train was precipitated into the water, eight persons losing their lives, five being servants of the company and three passengers, consisting of the Rev. Mr. and Mrs. Seymour and Mr. Charry. One body was found in the river a few days after, sixty miles from the scene of the accident. The foundations of the bridge, which rested on treacherous ground, were undermined by the scour; but whether the structure gave way before the train arrived at the bridge, or while it was crossing, does not appear to have been ascertained. A commission of experienced officers has been appointed to investigate the condition of all the bridges on the line, which are constructed in a similar manner.

Accident on the
Madras line.

26. From the number of fires it would appear that the spark catchers which it was thought would have removed the chief cause are susceptible of improvement. The question is being again looked into in this country. The inference which will naturally be drawn from the occurrence of so many cases of "running over cattle" is that the fencing is at fault, and to a certain extent it may be so considered; but it is a question whether, instead of being not good enough, it may not be too good, or whether in fact it may not be safer in many places to do without it altogether. When it is borne in mind that wild buffaloes, camels, sheep, goats, wild pigs, bears, wolves, and even elephants, are included in the term "cattle," it will not be thought surprising that a fence must be of a very peculiar character to keep them out, especially when they may be tempted by a richer pasturage within than without the railway boundary. Instances have been brought forward, in fact, where cattle, with the cognisance, if not the encouragement, of the herdsmen, have passed over on to the railway land to feed there. Having entered, it is not so easy to return, especially when terrified by a train, and the consequence is that the beast is run over, unless the cow-catcher does its work properly. The American plan of leaving the railways unfenced through grazing lands, and of making the herdsman responsible, might be advantageously applied to certain parts of India. The matter is now receiving the consideration of the Government, who seem doubtful as to the necessity for requiring fencing for some of the state lines. A Bill, moreover, has been introduced into the Legislative Council, which, if it becomes law, will make herdsmen or owners of cattle liable to heavy fines for allowing cattle to trespass on railways. The fencing of the 5,000 miles of railway now open in India has probably cost not less than 1,000,000*l.* This would be worth saving on the next 5,000 miles.

Fires.

Fencing.

27. The statements and remarks which follow are taken from the report compiled for the Government of India.

TABLE No. I.

ABSTRACT of the NUMBER and NATURE of the ACCIDENTS and of the Injuries to Life and Limb which occurred in 1870 on all Railways open for Traffic in India.

Presidency.	Mean Mileage open.	Railways.	Classification of Accidents to Trains, &c.							Passengers.				Servants of Companies or of Contractors.				Other Persons.						Total Persons of all Classes.			
			Main Heads.					Total.	From Causes beyond their own Control.		From their own Misconduct or want of caution.		From Causes beyond their own Control.		From their own Misconduct or want of caution.		Whilst crossing at Level Crossings.		Whilst trespassing (including Suicides).		Miscellaneous.						
			I. Collisions.	II. Getting off proper Line.	III. Fire.	IV. Running over cattle.	V. Other Causes.		Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed and Injured.
Bengal	1,354	East Indian	1870	5	10	1	128	2	147	1	38	9	14	5	8	25	46	1	1	41	8	7	1	89	116	205	
	1,354		1869	33	9	—	30	4	76	1	23	13	10	2	24	39	46	3	2	33	10	5	1	96	116	212	
	112	Eastern Bengal	1870	1	1	3	3	—	8	—	—	—	2	1	2	—	—	—	—	2	—	—	—	5	4	9	
	112		1869	—	2	—	—	1	3	—	—	1	—	—	—	3	3	—	—	2	—	—	—	6	3	9	
	28	Calcutta and South-eastern.	1870	—	1	—	3	—	4	—	—	—	—	—	—	1	1	—	—	—	—	—	—	1	1	2	
	28		1869	—	—	1	1	1	3	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	1	
	27	Nulluttee	1870	—	—	—	1	8	9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1
	27		1869	—	3	1	1	1	6	—	—	1	—	—	—	—	—	—	—	1	—	—	—	—	1	—	1
	42	Oude and Rohilkund	1870	2	3	1	4	4	14	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1	—	2
	42		1869	—	4	20	6	3	33	—	—	—	—	—	1	2	6	—	—	—	—	—	—	—	2	7	9
541	Punjab and Delhi	1870	3	34	38	4	18	97	—	—	—	3	—	1	8	4	—	—	—	—	—	—	—	8	8	16	
441		1869	6	6	15	—	4	31	—	—	—	2	4	5	10	2	1	—	3	—	—	—	—	18	9	27	
711	Madras	Madras	1870	3	4	6	53	8	74	8	—	—	—	6	2	10	7	—	2	2	—	—	—	21	11	32	
689			1869	1	9	2	34	4	50	—	—	—	1	—	—	10	10	1	—	1	—	—	—	12	11	23	
168	Great Southern of India.	of India.	1870	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	
168			1869	—	—	—	41	—	41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	2	
19	Carnatic	—	1870	—	—	—	2	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	2	
19			1869	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Bombay	1,160	Great Indian Peninsula	1870	46	182	2	52	31	313	—	1	—	2	1	6	44	46	1	1	14	11	—	—	61	67	128	
	872		1869	31	94	11	25	22	183	19	43	1	—	2	8	25	82	—	—	7	2	—	2	54	82	136	
	312	Bombay, Baroda, and Central India.	1870	8	19	1	46	1	75	—	3	—	—	—	1	9	8	—	—	8	2	—	—	17	14	31	
	308		1869	6	16	—	106	3	131	11	19	1	—	—	1	12	10	—	—	1	1	—	—	25	25	50	
	106	Scinde	—	1870	—	4	1	18	5	28	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	1
109	1869			1	6	2	3	2	14	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	3	3	
India	4,581	—	1870	59	258	53	314	78	772	4	42	9	21	13	20	101	114	2	4	68	22	8	1	204	224	428	
	4,170		1869	78	149	52	248	45	572	31	79	17	13	8	34	100	112	6	2	48	15	5	3	216	258	474	

TABLE NO. II.—NUMERICAL ABSTRACT OF ACCIDENTS of all Classes on all Railways open for Traffic in India during the Year 1870.

	BENGAL, NORTH-WESTERN PROVINCES, OUDE, AND PUNJAB.												MADRAS.						BOMBAY.						Total.			
	East Indian.		Eastern Bengal.		Calcutta and South-Eastern.		Nulhuttee.		Oude and Rohilkand.		Punjab and Delhi.		Madras.		Great Southern of India.		Carnatic.		Great Indian Peninsula.		Bombay, Baroda, & Central India.		Scindo.					
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed & Injured.	
PASSENGERS.																												
<i>From causes beyond their own control, viz. —</i>																												
From accidents to trains	1	37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
From other causes	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Total	1	38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Per million of passengers	0·19	7·09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
<i>From their own misconduct or incaution</i>																												
Per million of passengers	1·68	2·61	—	1·45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Total from all causes	10	52	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
SERVANTS OF COMPANIES OR OF CONTRACTORS.																												
<i>From causes beyond their own control</i>																												
From their own misconduct or incaution	25	46	2	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Total from all causes	30	54	3	2	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
OTHER PERSONS.																												
Crossing at level crossings	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Trespassers, including suicide	41	8	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Miscellaneous	7	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Total from all causes	49	10	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Grand total of all classes from all causes	89	116	5	4	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Mean length of railway open during the year (miles)	1,354		112		28		28		42		541		711		168		19		1,160		312		106		4,581			
Number of passengers carried	5,353,547		1,376,671		290,691		72,950		354,292		1,876,238		2,091,886		767,584		79,572		3,226,623		2,561,220		95,097		18,146,371			
Train mileage (goods and passengers)	6,519,914		364,522		89,645		21,376		59,662		928,396		2,456,252		240,086		27,892		3,633,107		1,068,864		132,623		15,502,339			

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TABLE No. III.

Showing the TOTAL NUMBER of ACCIDENTS to PERSONS of all kinds, and to TRAINS, &c., on all RAILWAYS open for TRAFFIC in each Presidency of India, during the Year 1870.

Presidencies.	Mean Length of Railway open.	Total Number of Train Miles.	Train Miles per Mile open.	Total Number of Accidents to Trains, &c., of all kinds.	Total Number of Passengers carried.	Average Number of Passengers per Mile opened.	Passengers.		Servants.				Trespassers, &c.		Total.			
							Killed.	Injured.	Beyond their own Control.		Within their own Control.		Killed.	Injured.	Killed.	Injured.	Killed and Injured.	
									Killed.	Injured.	Killed.	Injured.						
Bengal -	1870	2,105	7,933,515	3,769	279	9,324,389	4,430	10	57	6	11	86	52	52	11	104	131	235
	1869	2,005	7,739,367	3,860	152	8,426,046	4,202	16	35	6	30	54	57	48	13	124	135	259
Madras -	1870	898	2,734,230	3,045	77	2,939,042	3,273	3	-	6	2	11	7	2	2	22	11	33
	1869	876	2,211,791	2,525	92	3,094,630	3,533	-	1	-	-	10	10	3	2	13	15	26
Bombay -	1870	1,578	4,934,594	3,064	416	5,862,940	3,728	-	6	1	7	53	55	24	14	78	82	160
	1869	1,289	3,752,203	2,911	328	4,992,361	3,873	32	56	2	4	37	45	8	5	79	110	189
India -	1870	4,581	15,502,339	3,384	772	18,146,371	3,961	13	63	13	20	100	114	78	27	204	224	428
	1869	4,170	13,703,291	3,286	572	16,513,037	3,960	48	92	8	34	101	112	59	20	216	258	474

Sixty-nine collisions are reported in 1870, against 78 in 1869, and 64 in 1868; the train and open mileages in the three years have been—

Causes of accidents.
Collisions.

	Train Mileage.	Open Mileage.
In 1868 - - - -	11,431,656	3,958
In 1869 - - - -	13,703,381	4,170
In 1870 - - - -	15,502,339	4,581

Of these 69, no less than 46 occurred on the Great Indian Peninsula Railway, over which 3,633,107 train miles were run; and only six on the East Indian Railway, over which 6,919,914 train miles were run. The result of the whole 69 collisions was that three persons were killed and 42 injured.

Under the head, "Getting off proper line," a very serious increase in the number of accidents is reported, the total for all India being:—

In 1868	-	-	-	104
In 1869	-	-	-	149
In 1870	-	-	-	258

Getting off line.

This increase is quite out of proportion with the increase in the number of miles worked or of trains run. Of the whole 258 accidents, 182 occurred on the Great Indian Peninsula Railway; 40 on the Scinde, Punjab, and Delhi Railway; and only 10 on the East Indian Railway.

There were 53 cases of fire in 1870, against 52 cases in 1869, and 27 in 1868. In 1869 the greatest number of cases occurred on the Oude and Rohilkund Railway, but in 1870 the Scinde, Punjab, and Delhi Railway stands at the head of the list, with no less than 39 cases of fire. With few exceptions, all cases from fire are reported to be caused by sparks from the engine, and, as might be expected, are most frequent on lines where wood fuel is burned. They seem, however, to be by no means confined to such lines. The following table shows the amounts paid by the three principal companies during the last few years for compensation for losses by fire:—

Fire.

Railway Company.	1867.	1868.	1869.	1st Half 1870.
	Rs.	Rs.	Rs.	Rs.
East Indian (<i>burns coal</i>)	28,365	1,135	7,749	9,529
Great Indian Peninsula (<i>burns coal</i>)	36,671	4,338	20,831	500
Madras (<i>burns wood</i>)	1,354	16,854	3,968	14,983

314 cases of running over cattle occurred in 1870, of which 128 were on the East Indian Railway; 53 on the Madras Railway; 52 on the Great Indian Peninsula Railway; and 46 on the Bombay, Baroda, and Central India Railway. No serious accident has been occasioned by running over cattle; but on two occasions out of the 128 on the East Indian Railway carriages were thrown off the line by the shock. On the Jubbulpore line a fast mail train ran over a buffalo, and a second-class carriage left the rails; and on the main line a fast mail train ran over a wild buffalo, and the rear break van was thrown off the line. No person was hurt on either occasion. On the Madras Railway a buffalo was run over, and a wagon was in consequence thrown off the rails and dragged for a couple of miles. On the Scinde Railway a horse was run over, and, as the ballast was low, it got under the cow-catcher, but fortunately no harm resulted.

Running over cattle.

45 accidents occurred in 1869, and 78 in 1870, which cannot be classified under any of the foregoing heads. Of these, 11 in 1869 and 12 in 1870 were due to defective rolling stock; 9 in 1869 and 16 in 1870 to the neglect of gate-men or police; and five in 1869 and twelve in 1870 were caused by the locomotive department.

Other causes.

PROCEEDINGS IN THIS COUNTRY.

Proceedings in this country.

28. The proceedings in this country have consisted, as usual, in raising the necessary capital, meeting the requisitions for stores from India, and shipping the various materials to their destination. The four principal Companies have now nearly completed the construction of their lines, so that stores in future to be provided by them will be chiefly for maintenance and working purposes. The amount of such materials, however, will not be inconsiderable, though of course much less than the yearly average of those sent to make and equip the lines.

Shipments.

29. The shipments during the past year and from the commencement of operations are shown in the following tables.

SHIPPING OPERATIONS DURING 1870.

Railway.	Number of Ships employed in 1870.	Number of Tons of Goods shipped in 1870.	Value of Goods shipped in 1870.	Amount paid for Freight and Insurance in 1870.	Rate of Freight and Insurance per Ton.
			£	£	£ s. d.
East Indian - - -	33	18,280	153,948	25,642	1 8 0
Great Indian Peninsula - - -	110	111,904	487,800	189,291	1 13 10
Madras - - -	33	11,427	80,268	16,443	1 8 9
Bombay, Baroda and Central India	60	*11,911	75,960	19,876	1 13 4
Scinde, Punjab and Delhi - - -	34	2,508	53,241	6,667	2 13 0
Great Southern of India - - -	29	28,071	194,600	47,127	1 13 7
Eastern Bengal - - -	9	550	8,957	1,057	1 18 0
Oude and Rohilkund - - -	122	68,496	539,273	90,539	1 6 5
Carnatic - - -	4	2	190	22	11 0 0
State Railways - - -	31	10,300	87,275	13,802	1 6 9
Total - - -	465	263,449	1,681,512	410,466	

* Exclusive of coal.

SHIPMENTS FROM THE COMMENCEMENT.

Period.	Number of Ships employed.	Number of Ships lost.	Number of Tons of Goods shipped.	Value of Goods shipped.
				£
Up to end of 1860 - - -	2,605	39	2,094,686	10,431,976
In 1861 - - -	407	—	182,621	1,669,443
" 1862 - - -	280	1	138,013	1,487,582
" 1863 - - -	279	2	166,840	1,285,464
" 1864 - - -	233	—	102,818	1,018,164
" 1865 - - -	442	2	199,157	1,729,543
" 1866 - - -	581	7	312,227	2,527,757
" 1867 - - -	512	5	333,329	3,052,652
" 1868 - - -	364	3	188,858	1,849,554
" 1869 - - -	455	1	211,750	1,432,784
" 1870 - - -	461	1	263,449	1,688,209
Total - - -	6,619	61	4,193,248	28,173,128

Proprietors.

30. Within the last two years the proprietors of the various shares, stocks, and debentures have increased from 53,500 to 58,637, while the capital has increased from 82,376,625*l.* in March 1869 to 91,102,810*l.* on the 1st April last.

Railway.	Number of Shareholders on 31st December 1870.						Number of Debenture Holders.		Total Number of Proprietors on the 31st December 1870.
	Registered in England.			In India.			Bond.	Stock.	
	With Stock or Shares to the Amount of 1,000 <i>l.</i> and upwards.	With Stock or Shares of less Amount than 1,000 <i>l.</i>	Total in England.	Europeans.	Natives.	Total in India.			
East Indian - - -	6,476	7,854	14,330	234	126	360	1,565	505	16,760
Great Indian Peninsula -	5,296	7,190	12,486	70	97	167	1,535	887	15,075
Madras - - -	2,595	3,784	6,378	—	—	—	728	—	7,106
Bombay, Baroda and Central India - - -	2,088	3,687	5,755	13	69	82	933	—	6,770
Scinde, Punjab and Delhi - - -	2,944	3,906	6,850	77	11	88	30	—	6,968
Great Southern of India -	612	805	1,417	2	7	9	77	—	1,494
Eastern Bengal - - -	667	997	1,664	23	20	43	452	—	2,169
Oude and Rohilkund - - -	705	965	1,670	12	20	32	47	—	1,749
Carnatic - - -	149	381	529	9	18	27	—	—	556
Total - - -	21,333	29,249	51,079	440	368	808	5,367	1,392	58,637

CAPITAL EXPENDITURE AND FINANCIAL POSITION OF THE RAILWAY COMPANIES.

31. Up to the 1st April last a sum of about 88,064,000*l.* had been expended by the Companies on the railways undertaken by them. Of this, 5,500,000*l.* was expended during the year just past, and about 614,000*l.* represents the capital of the Calcutta and South-eastern Railway Company now in the possession of the Government. The total amount of capital which, it is estimated, will be required for the lines which have been sanctioned, including those open and those incomplete, is estimated at about 100,000,000*l.*, of which 91,102,810*l.* has been raised and paid into the Government treasury. Of this, a sum of 6,225,971*l.* was raised last year, 5,252,322*l.* by means of shares, 839,299*l.* by debenture stock, and 134,350*l.* by terminable debentures. Finance.

32. The 91,102,810*l.* above mentioned consists, 1st, of share capital, 78,487,585*l.*; 2nd, of debentures, 10,242,485*l.* (of which 3,363,285*l.* are convertible into shares at the option of the holder); and 3rd, debenture stock, 2,372,740*l.* The present financial year began with a balance of about 3,652,995*l.* in favour of the Companies towards the expenditure of the current year, which has been estimated at 4,600,000*l.*, of which 1,985,000*l.* will be in England.

33. With regard to the State lines, no accurate estimates have yet been made of their cost, but the following figures will give an approximate idea of the money required for those which have been decided upon:— State lines.

	Length.	Estimated Cost.
Punjab Northern, from Lahore to Peshawar -	270 miles	£3,000,000
Indus Valley, from Moulton to Kotree -	500 "	5,000,000
Rajpootana { from Agra to Ajmere -	236 "	2,500,000
{ from Delhi to join the above branch to Salt Works -	125 "	
{ branch to Salt Works -	8 "	
Indore to Khundwa on Great Indian Peninsula Railway -	84 "	800,000
Wurda, on Great Indian Peninsula Railway, to coalfields at Warora -	45 "	300,000
Carwar to Hooblee -	60 "	700,000
	<u>1,328</u>	<u>£12,300,000</u>

34. During the year 1870-71 a sum of about 280,000*l.* has been expended by the Government on surveys, plans, and certain materials connected with the foregoing projects; and the short line of 7½ miles, connecting Oomrawuttee with the Great Indian Peninsula Railway, has been constructed for 30,000*l.* In the year 1871-72 it is calculated that about 1,500,000*l.* will be required by the Government, but no actual estimates or accounts have yet been received in this office from the Government in India. In addition to the above mentioned lines, one from Goolburga on the Great Indian Peninsula Railway to Hyderabad, 116 miles in length, has been undertaken by the Nizam, who will expend on it this year a sum of about 250,000*l.* Government surveys, &c.
Goolburga line.

35. The following tables, prepared in the Accountant General's department of this office, explain the financial position of each Company:—

STATEMENT No. 1.

Showing the Amount of Capital estimated to be required for each Undertaking as now sanctioned, the Amount authorised to be raised, the Amount raised, and the Amount expended, to 31st March 1871.

Railway.	Estimated Cost of Lines.	Amount authorised to be raised to 31st March 1871.					Amount raised in England to 31st March 1871.				Amount raised in India to Date of last Advices.	Total Amount raised to 31st March 1871.	Total Amount expended to 31st March 1871 (partly estimated).
		Share Capital.	Debentures.		Debenture Stock.	Total.	Share Capital.	Debentures.		Debenture Stock.			
			Convertible into Shares.	Inconvertible.				Convertible into Shares.	Inconvertible.				
East Indian { Main line -	£ 27,500,000	£ 22,169,430	£ 830,570	£ 2,950,000	£ 1,500,000	£ 27,450,000	£ 21,797,407	£ 830,570	*£ 2,959,550	£ 744,100	£ 326,290	£ 26,657,917	£ 27,277,628
East Indian { Jubbulpore line -	£ 3,500,000	£ 2,625,580	£ 574,420	—	—	£ 3,200,000	£ 2,614,900	£ 574,420	—	—	£ 7,665	£ 3,196,985	£ 3,123,648
Great Indian Peninsula -	£ 26,000,000	£ 20,000,000	—	£ 2,793,200	£ 1,956,850	£ 24,750,050	£ 18,523,856	—	£ 2,793,200	£ 1,620,110	£ 404,371	£ 23,341,537	£ 22,417,464
Madras - - - -	£ 11,000,000	£ 8,655,700	£ 844,300	£ 500,000	—	£ 10,000,000	£ 8,608,311	£ 844,300	£ 458,850	—	—	£ 9,911,461	£ 9,748,135
Bombay, Baroda, and Central India - - - -	£ 8,500,000	£ 7,056,900	£ 943,100	—	—	£ 8,000,000	£ 6,759,562	£ 943,095	—	—	£ 21,672	£ 7,724,329	£ 7,436,158
Scinde, Punjab, and Delhi -	£ 12,000,000	£ 11,402,600	£ 22,100	—	—	£ 11,424,700	£ 10,807,667	£ 22,100	—	—	£ 48,735	£ 10,878,502	£ 10,106,700
Great Southern of India -	£ 3,000,000	£ 2,323,500	£ 97,900	£ 75,000	£ 425,000	£ 2,921,400	£ 2,256,279	£ 97,900	£ 75,000	£ 7,000	£ 1,221	£ 2,437,400	£ 1,656,067
Eastern Bengal - - -	£ 3,000,000	£ 2,250,000	—	£ 592,600	£ 6,100	£ 2,848,700	£ 2,222,061	—	£ 592,600	£ 1,530	£ 16,337	£ 2,832,528	£ 2,860,667
Oude and Rohilkund - -	£ 5,000,000	£ 3,881,100	£ 118,900	—	—	£ 4,000,000	£ 3,037,179	£ 50,900	—	—	£ 396,259	£ 3,484,337	£ 2,766,400
Carnatic - - - -	£ 800,000	£ 800,000	—	—	—	£ 800,000	£ 637,814	—	—	—	—	£ 637,814	£ 56,948
Total - - - -	£ 100,300,000	£ 81,164,810	£ 3,431,290	£ 6,910,800	£ 3,887,950	£ 95,394,850	£ 77,265,036	£ 3,363,285	£ 6,879,200	£ 2,372,740	£ 1,222,549	£ 91,102,810	£ 87,449,815

* Including £9,550 debentures, which fell due on 15th December 1870, payment of which had not been claimed on the 31st March 1871.

Accountant General's Department,
8th April 1871.

W. G. GOODLIFF,
Accountant General.

STATEMENT NO. 2.

Showing the Amount received from and withdrawn by each Company during the Year ended 31st March 1871.

Railway.	Sums standing to the Credit of the Companies on the 31st March 1870.	Sums advanced to the Companies on the 31st March 1870.	Amount received between 1st April 1870 and 31st March 1871.			Amount withdrawn.				Total received during the Year ended 31st March 1871.	Total Amount withdrawn during the Year ended 31st March 1871 (partly estimated).
			Share Capital.	Debenture Stock.	Debentures.	In England, between 1st April 1870 and 31st March 1871.	In India.		Estimated Withdrawals between dates specified and 31st March 1871.		
	£	£	£	£	£	£	Date to which Accounts have been received.	£	£	£	£
East Indian { Main line - Jubbulpore line	— * 612,084	* 71,965 —	£ 91,269 —	£ 744,100 —	£ — —	† 1,686,165 —	31st Jan. 1871 "	‡ 353,050 § 535,747	50,000 3,000	£ 835,369 —	£ 1,383,115 538,747
Great Indian Peninsula	126,982	—	2,009,726	86,669	—	609,656	"	619,648	70,000	2,096,395	1,299,304
Madras - - -	308,545	—	10,026	—	134,350	81,572	31st Dec. 1870	158,023	50,000	144,376	289,595
Bombay, Baroda and Central India.	434,963	—	11,440	—	—	251,882	31st Jan. 1871	¶ 102,650	12,000	11,440	158,232
Scinde, Punjab and Delhi	—	164,630	1,034,369	—	—	120,278	Scinde Rlwy. { 31st Jan. 1871 Indus Flotilla { 1871 Punjab Rlwy. { 31st Dec. 1870 Delhi Rlwy. { 1870	** 64,341	42,000	1,034,369	97,937
Great Southern of India	907,894	—	56,400	7,000	—	168,993	31st Dec. 1870	15,968	5,000	63,400	189,961
Eastern Bengal - -	27,758	—	58,106	1,530	—	16,243	31st Jan. 1871	82,290	17,000	59,636	115,533
Oude and Rohilkund -	501,161	—	1,564,772	—	—	542,126	"	635,870	170,000	1,564,772	1,347,996
Carnatic - - -	180,856	—	416,214	—	—	10,197	31st Dec. 1870	3,507	2,500	416,214	16,204
Total - - -	3,100,243	236,595	5,252,322	839,299	134,350	3,487,112	—	1,528,012	421,500	6,225,971	5,436,624

* These Balances are subject to adjustment in respect of Rolling Stock supplied by the Main line for the Jubbulpore line to the value, as approximately estimated, of £500,000.

† Includes £1,490,450 for the discharge of debentures.

‡ This sum is the difference between the amount expended in India on the Main line within the year, and the amount transferred from the Jubbulpore line in repayment of the value of Materials and Stores supplied from [the Main line.

§ Includes £512,559 transferred, as stated in preceding note, to the Main line.

|| Includes £100,000 for the discharge of debentures.

¶ Transfers of expenditure to Revenue Account, and the sale proceeds of Stores, exceed by this sum the amount withdrawn in India on Capital Account between 1st April 1870 and 31st January 1871.

** Difference between the amount withdrawn in India on Capital Account, and the amount of balances to the credit of the Indus Steam Flotilla taken in reduction of Capital Expenditure.

Accountant General's Department,
8th April 1871.

W. G. GOODLIFFE,
Accountant General.

STATE OF DEBENTURE LOANS ON the 31st March 1871.

Railway.	Amount.			Rate of Interest.	Date at which Loan expires.	Whether renewable.
	Convertible.	Inconvertible.	Total.			
East Indian	—	9,550		5	15th Dec. 1870. (remaining unclaimed on 31st March 1871.)	Renewable.
"	187,920	—		5	1st April 1871.	
"	456,570	—		5	9th August 1871	
"	50,000	—		4½	10th July 1872.	
"	—	1,000,000		4½	22d August 1872.	
"	—	440,000		4½	19th March 1873.	
"	—	10,000		4½	19th March 1875.	
"	574,420	—		5	23d March 1875.	
"	—	196,150		4½	10th August 1875.	
"	—	1,024,000		4½	" "	
"	136,080	—		5	9th August 1876.	
"	—	96,400		4½	10th August 1877.	
"	—	183,450		4½	" "	
	1,404,990	2,959,550	4,364,540			
Great Indian Peninsula	—	382,350		5	30th June 1871.	
"	—	6,400		4½	" "	
"	—	583,400		5	31st Dec. 1871.	
"	—	39,200		5	" "	
"	—	435,000		5	30th June 1872.	
"	—	42,800		4½	" "	
"	—	268,800		5	30th June 1873.	
"	—	1,035,250		5	31st Dec. 1876.	
	—	2,793,200	2,793,200			
Madras	100	—		5	1st January 1871. (remaining unclaimed on 31st March 1871.)	
"	13,000	—		5	1st July 1871.	
"	403,600	—		5	1st January 1872.	
"	216,900	—		5	" "	
"	—	458,850		4½	1st January 1876.	
"	210,700	—		5	1st January 1877.	
	844,300	458,850	1,303,150			
Bombay, Baroda and Central India	170,200	—		5	1st July 1871.	
"	204,795	—		5	1st July 1872.	
"	317,900	—		5	1st January 1875.	
"	250,200	—		5	1st July 1876.	
	943,095	—	943,095			
Scinde, Punjab and Delhi	22,100	—	22,100	5	1st May 1871.	
Great Southern of India	—	75,000		4½	1st July 1871.	
"	3,900	—		5	" "	
"	28,700	—		5	1st July 1872.	
"	10,000	—		5	1st January 1874.	
"	55,300	—		5	1st July 1874.	
	97,900	75,000	172,900			
Eastern Bengal	—	15,250		5	12th April 1871.	
"	—	333,450		5	12th October 1871.	
"	—	4,900		5	1st November 1871.	
"	—	181,900		5	1st November 1874.	
"	—	57,100		5	1st November 1876.	
	—	592,600	592,600			
Onde and Rohilkund	100	—		5	28th July 1871.	} Renewable.
"	100	—		5	9th March 1872	
"	300	—		3	24th March 1872	
"	50,300	—		5	15th April 1875.	
"	100	—		5	28th July 1876.	
	50,900	—	50,900			
			10,242,485			

36. The debenture loans, which on the 1st April 1870 stood at 13,605,685 $\frac{1}{2}$., have been reduced by 3,363,200 $\frac{1}{2}$., during the year, and replaced either by debenture stock or by share capital. A further reduction of about 2,250,000 $\frac{1}{2}$., will take place during the present year. The total amount of debenture stock now issued is 2,372,740 $\frac{1}{2}$.. The further issue of this stock, which, being limited to the amount that the Companies are empowered to borrow, can only be in substitution of debentures not convertible into shares, will be facilitated by the power lately given to trustees, who have hitherto been able to hold debentures, to take debenture stock instead.

Reduction of debenture loans.

Debenture stock.

37. On various occasions when it was necessary to issue fresh capital, instead of guaranteeing such a rate of interest below 5 per cent. as would have enabled the companies to issue shares at par, they have been allowed to offer to their shareholders and the public shares or stock bearing 5 per cent. interest at a premium, the amount realised by this premium being paid to an account not bearing interest at the credit of each company, and expended on its works like the rest of the capital. Stock upon these conditions has been put out at prices varying from 2 $\frac{1}{2}$., to 8 $\frac{1}{2}$., or 9 $\frac{1}{2}$., per cent. premium.

Premium realised from issue of shares, &c.

38. The following statement shows the amount received from each of the under-mentioned railway companies as premium on the issue of capital to the 31st March 1871:—

	£	s.	d.
East Indian	147,498	10	11
Great Indian Peninsula	207,857	2	9
Bombay, Baroda and Central India	18,000	0	0
Great Southern of India	36,000	0	0
Eastern Bengal	1,964	8	0
Carnatic	22,200	0	0
Total	£433,520	1	8

39. The following statement gives the amount of capital expended by the Companies named to the 31st March 1871. The cost per mile and the manner in which the expenditure was distributed may be seen by the following statements.

Average cost per mile.

Railway Company.	Length opened 31st March 1871.	Cost to 30th March 1871.	Cost per Mile.
		£	£
East Indian	1,503	30,401,276	20,227
Great Indian Peninsula	1,272	22,417,464	17,623
Madras	832	9,748,135	11,716
Bombay, Baroda and Central India	312	7,436,158	23,833*
Scinde, Punjab and Delhi	675	10,106,700	14,972
Great Southern of India	168	1,454,666	8,658
Eastern Bengal	159	2,860,667	17,928

* This represents an expenditure on a certain portion of line not yet opened.

Distribution of capital expended.

Railway Company.	Works and Bridges.	Permanent Way and Stations.	Freight and Insurance.	Rolling Stock and Engines.	Establishments.	Miscellaneous, Electric Telegraph, Stores, &c.
	£	£	£	£	£	£
East Indian	9,530,000	7,115,000	2,975,000	3,450,000	3,700,000	3,685,000
Great Indian Peninsula	9,077,553	7,051,054	1,661,231	2,727,366	1,551,965	202,301
Madras	3,008,635	3,608,920	—	1,048,084	806,232	407,931
Bombay, Baroda and Central India	3,081,211	1,824,368	—	1,079,037	717,144	735,810
Scinde, Punjab and Delhi*	1,966,837	3,395,957	759,368	1,218,447	1,028,250	1,193,979
Great Southern of India	—	1,007,555	—	133,835	175,285	72,507
Eastern Bengal	—	2,020,578	—	292,785	305,052	193,158
Oude and Rohilkund	285,360	760,380	—	117,380	211,130	105,210
Carnatic	6,100	31,599	—	12,063	11,264	12,279

* India Steam Flotilla:—
 Steamers and barges - - - 373,301 1 1
 Warehouses and workshops - - - 45,604 9 7
 Not included in above statement.

Rate of exchange.

40. It has been mentioned in previous reports, that in addition to the capital provided by the Companies under the Government guarantee, a contribution of something like 4,000,000*l.* has been made by Government through the operation of provisions of the contract with respect to the rate of exchange, viz. 1*s.* 10*d.* which the rupee was to be advanced by Government in India for the sterling money paid by the companies in England. For land and Government establishment further sum of about 3,000,000*l.* should be added, making the total sum expended on the guaranteed railways up to the end of the official year 1870-71 about 91,600,000*l.* This would bring the average cost per mile to 18,435*l.*

Annual expenditure of companies.

The following table gives the annual expenditure by all the companies:—

Year.	Miles opened during the Year.	Expended in England.	Expended in India.	Total.
		£	£	£
Up to 1850	—	130,375	44,781	175,156
In 1851	—	154,212	197,111	351,323
„ 1852	—	174,920	252,640	427,560
„ 1853	21½	252,484	418,165	670,649
„ 1854	50½	960,878	768,710	1,729,588
„ 1855	99	1,939,101	1,431,904	3,371,005
„ 1856	103¼	1,752,813	1,765,094	3,517,907
„ 1857	15½	1,324,873	2,092,395	3,417,268
„ 1858	140¾	1,940,052	3,551,073	5,491,125
„ 1859	194¼	2,507,949	4,654,923	7,162,872
„ 1860	211½	2,396,924	5,192,846	7,589,770
„ 1861	745¼	1,596,010	4,962,604	6,558,614
„ 1862	770	1,854,289	3,956,563	5,810,852
„ 1863	165¼	1,411,661	3,360,114	4,771,775
„ 1864	445¾	1,387,699	2,418,345	3,806,044
„ 1865	387½	2,192,090	3,192,323	5,384,413
„ 1866	199¼	3,942,598	3,816,957	7,759,555
„ 1867	369½	4,045,584	2,979,376	7,024,960
„ 1868	80	1,935,012	2,613,626	4,548,638
„ 1869	260½	2,156,114	2,236,913	4,393,027
„ 1870	549	3,487,112	1,919,512	5,406,624
To end of 1870	4,807¾	37,542,750	51,855,975	89,398,725

REVENUE.

41. The revenue derived from the railways during the year ending 31st December 1870 amounted to 2,846,600*l.*, being about 340,000*l.* in excess of the previous year. The gross receipts in 1870 were 6,213,865*l.*, compared with 5,709,382*l.* in 1869, and the expenses 3,367,261*l.* and 3,203,171*l.* respectively.

Revenue.

42. The amount paid by the Government for guaranteed interest during the corresponding period was in excess of the net receipts by 1,366,000*l.*, entailing to that extent a charge upon the revenues of the country. Of this, however, a sum of 500,000*l.* may be taken as having been paid upon capital not yet representing open or productive lines. The Oude and Rohilkund Railway Company, for instance, received interest upon 3,400,000*l.*, whereas only about 500,000*l.* was expended in the section which is at work. The same may be said of the interest for the capital expended on the Chord line of the East Indian, amounting to about 200,000*l.*, and of portions of the Great Indian Peninsula, Madras, Eastern Bengal, and others, which have either only recently been opened or are still in progress. But after taking these cases into account a considerable deficiency still remains, and although I believe that the earnings of some of the lines will soon cover the guaranteed interest, a certain amount will probably for some few years have to be borne by the State.

Guaranteed interest.

43. The gross receipts from passenger traffic in 1870 were 1,924,378*l.*, being 187,210*l.* in excess of 1869, when they were 1,737,168*l.* Those from goods traffic were 4,149,978*l.* in 1870, and 3,808,767*l.* in 1869. Miscellaneous receipts were 139,509*l.* and 163,447*l.* respectively.

Gross receipts.

44. While much may be done towards the improvement of the revenue from railways by wise economy, prudent management, and an equitable adjustment of rates and fares, their prosperity must in a great measure depend upon the general advance in the trade and condition of the people of the country. When commerce is active and labour is in demand, railways will thrive if they are properly managed. During the past year trade has been depressed and railways have suffered. Much of the cotton which had been grown has not found its way to the coast, and in some places it has been stored or buried to wait for better times. At the same time the high amount of working and maintenance expenses on certain lines seem to imply either an absence of strict economy or imperfect construction in the first instance, and to demand constant and earnest attention from the managers of the railways.

Economy for the future.

Recent depression of trade.

45. The following tables furnish the receipts and expenses of each line during the last two years, and the amount paid for guaranteed interest by the Government to the 31st December last. It will be seen that while 33,995,835*l.* has been advanced on this account, a sum of 16,403,373*l.* has been earned by the railways, and paid to the State, leaving 17,592,462*l.*, a portion of which may be recovered from the half surplus profits of those lines whose earnings exceed five per cent.

STATEMENT of the REVENUE in 1869 and 1870.

Railway.	Receipts.								Expenditure.						Per-centage of Working Expenses to Gross Receipts.		Net Receipts.	
	Passengers.		Goods.		Miscellaneous.		Total.		Maintenance.		Working.		Total.		1869.	1870.	1869.	1870.
	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.				
GUARANTEED.	£	£	£	£	£	£	£	£	£	£	£	£	£	£			£	£
East Indian: Main line -	678,532	722,510	1,743,474	1,840,728	54,907	68,231	2,481,913	2,631,469	178,561	193,897	857,031	905,562	1,035,592	1,099,459	41.72	41.78	1,446,321	1,632,010
„ Jubbulpore line -	42,561	62,846	51,861	55,976	14,177	8,641	109,599	122,463	23,104	19,170	94,344	85,676	117,448	104,846	108.14	85.61	<i>Dr. 8,849</i>	17,617
Great Indian Peninsula -	363,744	434,276	1,053,541	1,198,629	29,158	27,042	1,448,443	1,659,947	291,307	319,061	670,120	713,569	967,427	1,032,630	66.78	62.20	481,016	627,317
Madras -	189,730	187,112	347,877	286,912	23,023	19,189	562,630	493,213	102,686	72,923	173,932	186,770	276,618	259,693	49.16	52.65	286,012	233,520
Bombay, Baroda and Central India -	187,097	189,578	228,348	294,068	26,386	9,452	441,831	493,098	66,428	67,617	268,779	230,909	335,207	298,526	75.84	60.54	106,624	194,572
Scinde, Punjab and Delhi -	121,529	182,589	173,430	233,060	5,539	4,878	299,492	419,527	41,516	53,123	199,510	230,002	241,026	333,125	80.47	79.49	58,466	26,402
Indus Steam Flouilla -	11,139	5,211	75,243	94,937	1,663	780	88,045	100,928	—	388	67,673	63,292	67,673	63,540	76.86	62.95	20,370	27,388
Great Southern of India -	42,632	39,318	26,432	30,317	1,022	1,327	70,086	70,962	13,634	11,338	30,809	31,308	44,443	42,646	63.41	60.09	25,643	28,316
Eastern Bengal -	70,304	70,553	91,671	105,294	4,383	2,245	166,338	178,092	18,467	19,818	62,132	79,869	80,599	99,167	48.45	35.69	85,739	78,905
Oude and Rohilkund -	15,572	16,329	5,387	6,071	382	2,183	21,291	24,583	2,808	3,393	14,595	14,210	17,403	17,605	81.22	71.61	3,888	6,978
Carnatic -	3,972	3,954	856	409	81	56	4,849	3,518	1,959	742	2,851	3,225	3,910	3,967	80.63	112.76	939	<i>Dr. 449</i>
STATE.*																		
† Calcutta and South-eastern -	4,450	5,050	2,218	1,993	737	394	7,405	7,437	3,103	1,861	7,675	3,969	10,778	7,830	145.55	105.23	<i>Dr. 3,373</i>	<i>Dr. 393</i>
UNGUARANTEED.																		
Nulhattee -	5,906	5,952	2,429	2,534	125	92	8,460	8,623	1,214	968	3,831	3,239	5,045	4,207	69.63	48.75	3,415	4,421
Total -	1,737,168	1,924,378	3,808,767	4,149,978	163,447	139,509	5,709,382	6,213,865	743,897	763,751	2,459,284	2,603,510	3,293,171	3,367,261	56.10	54.18	2,506,211	2,846,604

MEMORANDUM.—The figures are quoted from returns furnished by the Companies in India

* An incomplete return only has been received of the working of the Khaungam Railway.

† This line was surrendered by the company of the same name to the Government.

GUARANTEED INTEREST.—INDIAN RAILWAYS.

Statement of the Total Amount of Interest advanced to each of the under-mentioned Railway Companies to 31st December 1870.

Railway Company.	Interest advanced to 31st December 1869.	Interest advanced during 1870.						Total.
		England.		India.		Total.		
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
East Indian - - -	12,767,601 4 2	1,480,015 0 11	13,227 7 7	1,493,242 8 6	14,260,843 12 8			
Great Indian Peninsula	6,780,613 6 10	1,026,633 9 9	19,749 19 8	1,046,383 9 5	7,826,996 16 3			
Madras - - - - -	3,909,176 9 1	482,954 12 7	—	482,954 12 7	4,392,131 1 8			
Bombay, Baroda and Central India - -	2,382,472 14 6	379,255 3 5	1,083 9 5	380,338 12 10	2,762,811 7 4			
Scinde, Punjab & Delhi	2,617,931 10 1	479,902 8 10	2,395 0 6	482,297 9 4	3,100,228 19 5			
Great Southern of India	394,701 19 0	94,474 14 8	—	94,474 14 8	489,176 13 8			
Eastern Bengal - -	786,155 10 9	137,116 9 1	793 10 0	137,909 19 1	924,065 9 10			
Oude and Rohilkund -	140,105 3 4	86,243 14 4	926 13 4	87,170 7 8	227,275 11 0			
Carnatic - - - - -	4,500 0 0	7,805 16 0	—	7,805 16 0	12,305 16 0			
Total - - - - -	£29,783,257 17 9	4,174,401 9 7	38,176 0 6	4,212,577 10 1	33,995,835 7 10			

Accountant General's Department,
8th April 1871.

W. G. GOODLIFFE,
Accountant General.

A STATEMENT showing approximately the AMOUNTS advanced on account of GUARANTEED INTEREST to the several under-mentioned Railway Companies to the 30th June 1870, beyond the amount of Net Revenue applied thereto.

Railway Company.	Total amount advanced to 31st December 1870.*	Aggregate of Net Revenue Balances for the several half-years to 30th June 1870, inclusive.	Net amount advanced.
	£	£	£
East Indian, Main line - - -	12,800,629	8,633,565	4,167,064
„ Jubbulpore line - - -	1,460,214	33,250	1,426,964
Great Indian Peninsula - - -	7,826,997	3,827,934	3,999,063
Madras - - - - -	4,392,131	1,921,821	2,470,310
Bombay, Baroda and Central India -	2,762,811	949,109	1,813,702
Scinde, Punjab and Delhi - - -	3,100,229	314,624	2,785,605
Great Southern of India - - -	489,177	209,063	280,114
Eastern Bengal - - - - -	924,065	492,621	431,444
Oude and Rohilkund - - - - -	227,276	18,224	209,052
Carnatic - - - - -	12,306	3,162	9,144
Total - - - - -	£33,995,835	16,403,373	17,592,462

* The Interest for the half-year to 30th June 1870 not being paid until the succeeding half-year.

Accountant General's Department,
8th April 1871.

W. G. GOODLIFFE,
Accountant General.

Guaranteed
interest.

46. The following statement gives the net amount of guaranteed interest paid by the Government on account of railway capital in each *official* year from 1856-57, *i.e.*, the amount which had to be borne by the revenue of the year after the net receipts from the railways had been applied towards the reduction of the advances for interest. The official year up to 1866 ended on the 30th April. Since that time it has been made to terminate on the 31st March. In my last report a similar statement was given, but the guaranteed interest on the Madras Irrigation capital was inadvertently included.

STATEMENT OF GUARANTEED INTEREST advanced by GOVERNMENT ON RAILWAY CAPITAL in each of the following Years, less Net Traffic Receipts.

		£			£
1856-57	-	404,197	1864-65	-	1,553,936
1857-58	-	526,420	1865-66	-	23,667
1858-59	-	606,046	1866-67	-	684,002
1859-60	-	796,872	1867-68	-	1,491,565
1860-61	-	1,096,332	1868-69	-	1,651,504
1861-62	-	1,396,991	1869-70	-	1,498,084
1862-63	-	1,541,140	1870-71	-	1,809,430*
1863-64	-	1,634,634			

TRAFFIC AND WORKING.

Traffic.

Passenger.

47. The statistics contained in the tables hereafter given furnish full particulars of the traffic and working of the various lines of railway now open. The general results with regard to passenger traffic show that the passenger tickets numbered 18,224,859, of which 135,829 were first class, 603,486 second, 584,980 intermediate, 14,181,221 third, and 2,719,343 fourth or coolie. Thus the third and fourth composed 92·72 per cent., the second and "intermediate" 6·52 per cent., and the first only 76 per cent. of the whole.

48. Each first-class passenger paid 14s., and travelled 112 miles at 1½d. per mile.

second	4s. 1¾d.,	48	1·02d.
third	1s. 8½d.,	58	·35d.
fourth	1s.	40	·30d.

Taking the passenger trains alone (exclusive of mixed and special), the average distance run by each train was 104 miles.

Goods.

49. The merchandise carried amounted to 2,633,687 tons, exclusive of coal, coke, and minerals, of which there were 801,582 tons. According to the returns furnished from India by the several companies the average distance run by each train with goods would be 144, with minerals 51, miles. The average amount paid for each ton of merchandise would be 1l. 5s., and of minerals 6s. 7d. Thus the average amount paid for each ton of merchandise per mile would be 2·08d., and for each ton of minerals 1·5d.†

50. The staples of the country which form the principal articles of traffic are grain, seeds, cotton, salt, sugar, jute, opium, timber, and hides. Fruit and vegetables are, in the neighbourhood of large towns, also now conveyed in large quantities. The chief articles of import which are carried up country by the railways are piece goods, iron, hardware, metals, cloth, and wines.

The following statement gives the quantities of these and some of the other principal articles which have been conveyed during the last year.

* Partly estimated.

† In the Appendix will be found a paper by Mr. Rendel on the results of the working of the East Indian Railway during the year. His data are probably more accurate than those upon which the above results are arrived at, in consequence of the necessity in the latter case of excluding the mixed trains. He makes out the average charge per mile to all passengers to be 38 of a penny on the East Indian Railway, and for goods 1·13 pence per ton.

STATEMENT of the QUANTITIES of the PRINCIPAL COMMODITIES conveyed on the GUARANTEED RAILWAYS in 1870, with the AMOUNTS paid for their CONVEYANCE.

ARTICLE.	East Indian.		Great Indian Peninsula.		Madras. *		Bombay, Baroda and Central India.		Sind, Punjab and Delhi.		Great Southern of India.		Eastern Bengal.		Oude and Rohilkhand.		Carnatic.	
	Quantity.	Receipts.	Quantity.	Receipts.	Quantity.	Receipts.	Quantity.	Receipts.	Quantity.	Receipts.	Quantity.	Receipts.	Quantity.	Receipts.	Quantity.	Receipts.	Quantity.	Receipts.
	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£
Cloth - - - - -											Tons: 615	£ 1,370					Tons. 196	£ 39
Coal and Coke - - -	282,502	142,092	2,240	2,104									14,026	4,053				
Coffee - - - - -					4,206	6,702			129	100								
Cotton - - - - -	33,243	183,156	90,641	360,925	8,930	18,038	43,138	71,553	8,416	7,817					397	101		
Dried Fruits - - -			9,954	22,785			8,868	11,058	8,440	2,926								
Grain - - - - -	63,000	78,300			24,191	16,606	77,027*	687,146	27,312	23,702	31,365	10,140	8,498	3,380	2,808	347	80	15
Green Fruits and Vegetables			10,180	11,886			6,879	5,521	1,202	1,134	1,077	1,005			397	101		
Hides - - - - -			792	1,708							546	1,159	3,185	2,247	407	90		
Jagrec and Sugar - -					13,078	26,859	12,863	18,709	9,434	7,734								
Jute - - - - -													70,808	70,433				
Metals and Hardware -	90,028	265,827	19,631	39,070	9,101	10,213	5,334	8,553	1,060	1,085								
Oil, &c. - - - - -			3,763	7,201	6,612	6,070			793	2,157	655	1,211					50	11
Opium - - - - -			4,034	86,202														
Piece Goods and Twist -	40,736	174,836	15,774	59,071			5,434	14,428	4,684	10,049			9,525	10,213	235	77		
Rice - - - - -	88,534	121,926			33,563	20,034											41	7
Salt - - - - -	102,640	98,730	50,084	94,148	55,066	33,897			1,441	1,366	7,096	8,377			3,097	375	1,520	145
Seeds - - - - -	160,936	226,374	147,210	173,142	11,977	10,447			6,052	4,007	2,471	2,239	14,361	9,427	403	64	198	48
Silk - - - - -									166	702								
Timber - - - - -			7,504	12,354	11,876	5,732	6,425	5,406	884	438					564	120		
Wines, Spirits, and Beer	8,773	44,151	5,008	14,525					7,867	17,900					959	378		
Tobacco - - - - -			330	578			4,001	61,959	284	382			4,246	25,161				

* Including seeds.

(0699)

D

Increase of traffic.

51. Comparing the results with the previous year, there is, as before stated under the head of revenue, a slight improvement in the gross receipts. Those per train mile almost correspond, being 8.49s. in 1870, and 8.47s. in 1869. The gross expenditure in 1870 was 3,343,139*l.*, and 3,135,497*l.* in 1869, and was 55 per cent. of the gross receipts in the former, and 57 in the latter. The receipts and expenses per train mile in each department will be found among the following statistics. The number of passengers has increased from 16,014,609 to 18,228,887, the proportion in the different classes being about the same. While the length of line open (including double lines) has increased from 4,065 to 4,780, the numbers of passengers per mile in 1869 and 1870 have been 3,940 and 3,971 respectively, and the amounts of goods were 636 and 716 tons per mile.

Working.

52. The number of locomotives and rolling stock belonging to each company and employed to carry on the traffic just described is given in the accompanying table.

Railway Company.	Locomotives.			Passenger Carriages.		Trucks and Wagons.		Total Number of Vehicles on 31st December 1870.
	Former Number.	Added in 1870.	Total Number, 31st Dec. 1870.	Former Number.	Added in 1870.	Former Number.	Added in 1870.	
East Indian - - -	537	•	535	901	22	6,562	284	7,769
Great Indian Peninsula - -	264	60	324	1,079	184	5,892	473	7,628
Madras - - - -	109	15	124	279	31	3,152	91	3,553
Bombay, Baroda and Central India } - - - -	63	9	72	183	—	2,874	—	3,057
Scinde, Punjab and Delhi - -	119	33	152	384	101	2,389	193	3,067
Great Southern of India - -	17	4	21	41	—	270	—	311
Eastern Bengal - - - -	43	—	43	124	22	640	10	796
Oude and Rohilkund - - -	6	4	10	33	1	89	4	127
Carnatic - - - - -	4	—	4	37	—	43	—	80
Total - - - - -	1,162	123	1,285	3,061	361	21,911	1,055	26,388

* Two locomotives were condemned as worn out.

SUMMARY of TRAFFIC on the INDIAN RAILWAYS in 1870.

SUMMARY of TRAFFIC on the

Railway.	Number of Miles of Open Line.			Number of Miles of Sidings.	Passenger Traffic.										Goods.			
	Double.	Single.	Total.		Number of Passengers (exclusive of Holders of Season and Periodical Tickets).							Number of Holders of Season and Periodical Tickets.	Number of Carriages and Palikess.	Number of Horses.	Number of Dogs, &c.	Live Stock.		
					First Class.	Second Class.	Intermediate Class.	Third Class.	Fourth or Coolie Class.	Total Number of Passengers.	Number of Cattle.					Number of Sheep.	Number of Pigs, &c.	
GUARANTEED.																		
East Indian (Main Line) -	278	853	1,131	251	31,164	96,509	564,837	4,443,736	—	5,136,606	1,138	1,311	4,443	7,232	370	1,303	29	
(Jubbulpore Line) -	—	234	234	12	3,302	11,513	14,994	185,914	—	215,723	80	80	401	472	86	6	—	
Great Indian Peninsula -	287	971	1,258	*	20,940	166,011	—	1,392,347	1,537,617	3,326,024	599	656	4,726	5,531	66	248,919	40	
Madras -	—	783	783	91	10,069	107,724	—	1,774,866	212,897	2,105,566	7	918	4,322	2,730	977	4,801	1,761	
Bombay, Baroda and Central India -	18	294	312	54	13,733	118,696	—	2,423,097	—	2,555,846	990	279	2,235	2,503	4,075	161,259	309	
Sind, Punjab and Delhi -	5	661	666	125	15,514	35,281	726	1,919,858	—	1,971,409	—	420	3,062	6,013	128	40	—	
Great Southern of India -	—	168	168	14	1,197	10,637	—	771,921	—	783,755	—	114	317	408	97	536	14	
Eastern Bengal -	—	113	113	*	27,340	36,346	—	293,149	908,070	1,224,907	1,155	112	696	1,416	54	30	—	
Oude and Rohilkund -	—	42	42	5	2,537	6,066	585	343,184	—	354,293	—	67	806	699	42	—	—	
Cuttack -	—	19	19	3	230	3,243	—	71,299	—	79,772	—	7	7	22	—	7	—	
STATE.																		
Calcutta and South-eastern -	—	28	28	9	—	5,327	—	232,250	—	237,477	59	4	20	77	153	23	1	
Khansam -	—	8	8	1	231	546	—	6,965	709	10,331	—	—	—	—	—	—	—	
UNGUARANTEED.																		
Null uttee -	—	26	26	*	633	1,033	3,888	67,385	—	72,949	—	26	25	54	—	—	—	
Totals -	588	4,192	4,780		135,829	603,486	694,980	14,181,221	2,719,843	18,224,859	4,028	3,915	21,751	27,037	6,057	416,952	2,154	

* Not stated.

MEMORANDUM.—The figures are quoted from the

INDIAN RAILWAYS in 1870.

Traffic.				Number of Trains run.						Number of Miles travelled by Trains (exclusive of Stunting, &c.)						Number of Engines employed.
Minerals (Including Earth and Railway Materials).		Total Number of Tons of Minerals.	Number of Tons of Merchandise (exclusive of Live Stock and Minerals).	Passenger.	Goods.	Mineral.	Mixed.	Extra.	Total Number of Trains.	Passenger.	Goods.	Mineral.	Mixed.	Extra.	Total Number of Miles.	
Number of Tons of Coal and Coke.	Number of Tons of other Minerals.															
260,486	15,863	244,718	893,009	2,397	7,010	2,005	17,684	4,079	34,344	153,870	2,424,876	415,281	2,366,764	710,062	6,070,662	486
390	—	390	69,037	—	401	—	1,400	331	2,285	—	80,011	—	836,337	42,903	440,251	87
2,340	429,374	432,114	540,405	10,084	18,504	5,130	5,139	—	39,436	1,215,252	1,820,159	41,168	556,528	—	3,683,107	252
762	40,868	41,077	303,012	—	—	—	9,550	633	10,238	—	—	—	1,443,044	49,874	1,492,918	109
5,396	11,368	16,704	244,706	730	4,503	2,034	8,247	177	15,331	223,330	376,066	30,041	285,102	10,707	934,316	52
232	1,468	1,740	279,040	15	3,532	—	4,675	304	8,576	1,036	360,664	—	682,583	17,128	1,061,411	75
—	610	610	70,900	—	—	—	3,220	—	3,220	—	—	—	239,668	—	239,668	21
14,025	5,046	19,000	171,500	8,132	1,070	—	920	6	5,434	173,327	138,835	—	52,584	766	364,522	*
—	477	477	26,800	—	—	405	952	37	1,424	—	—	16,884	40,740	2,044	59,668	16
—	10	10	2,855	—	—	—	1,400	8	1,468	—	—	—	27,740	152	27,892	4
550	132	698	21,454	—	—	—	1,310	23	1,538	—	—	—	33,360	685	30,045	3
—	—	—	11,463	—	163	—	310	—	463	—	474	—	2,450	—	2,954	1
3,060	226	3,235	6,457	—	—	—	730	33	763	—	—	—	20,452	924	21,376	4
230,753	564,820	901,682	2,633,637	16,038	36,012	10,294	53,592	6,294	125,140	1,763,974	5,201,125	512,374	6,082,982	835,235	14,306,700	

Returns furnished by the Agents in India.

* Not stated.

STATEMENT of the EXPENDITURE on REVENUE ACCOUNT in 1870.

Railway.	Maintenance and Renewal of Way and Works.		Cost of producing Locomotive Power by Wages and Materials.		Repairs and Renewals of Carriages and Wagons.		Traffic Charges.		Rates and Taxes.		Compensation for Personal Injury, &c.		Compensation for Damages and Loss of Goods.		Legal and Parliamentary Expenses.		Miscellaneous Working Expenditure, not included in the foregoing.		Total Working Expenditure.	
	Gross.	Per Train Mile.	Gross.	Per Train Mile.	Gross.	Per Train Mile.	Gross.	Per Train Mile.	Gross.	Per Train Mile.	Gross.	Per Train Mile.	Gross.	Per Train Mile.	Gross.	Per Train Mile.	Gross.	Per Train Mile.	Gross.	Per Train Mile.
GUARANTEED.																				
East Indian (Main Line)	199,897	7'06	878,453	14'06	100,402	4'21	218,604	8'04	3,419	'13	38	'00	4,885	'19	689	'02	192,053	7'63	1,089,450	3'62
" (Jubbulpore Line)	19,170	10'24	52,876	28'24	7,994	4'27	11,253	6'01	—	—	—	—	148	'07	—	—	18,410	7'16	104,846	4'06
Great Indian Peninsula	310,061	21'07	897,061	22'38	78,689	5'19	196,354	12'07	1,157	'08	3,440	'23	839	'06	2,287	'15	92,936	6'14	1,032,630	5'68
Madras	72,928	11'72	96,096	15'45	12,341	1'08	48,105	6'93	12,078	1'04	—	—	1,305	'22	1,023	'16	20,735	3'33	259,693	3'47
Bombay, Baroda and Central India	67,617	17'36	89,736	23'05	25,358	0'51	42,929	11'02	1,240	'31	1,760	'45	1,108	'28	911	'23	67,875*	17'44*	204,526	6'39
Scinde, Punjab and Delhi	53,123	12'01	124,038	28'04	17,880	4'04	70,921	16'03	2,015	'45	3	'00	608	'19	241	'05	64,036	14'48	333,125	6'27
Great Southern of India	11,238	11'38	15,555	15'87	2,954	2'36	6,342	0'35	933	'95	—	—	20	'03	2	'00	6,082	6'08	42,646	3'55
Eastern Bengal	19,818	12'71	25,005	10'46	10,925	7'19	23,360	15'37	2,467	1'62	—	—	59	'03	387	'25	17,696	11'63	99,167	5'14
Oude and Rohilkund	3,305	12'05	5,768	23'20	971	3'00	3,885	15'02	77	'80	200	'80	40	'16	—	—	3,200	13'14	17,605	5'90
Carnatic	742	6'38	847	7'39	96	'83	490	4'21	65	'56	—	—	—	—	127	1'09	1,600	13'73	3,067	2'84
STATE.†																				
Calcutta and South-eastern	1,861	11'43	2,921	17'95	267	1'64	1,908	12'24	150	'01	—	—	1	'00	27	'17	610	3'75	7,830	4'01
UNGUARANTEED.																				
Nulhuttee	968	10'87	1,380	15'49	501	5'65	956	10'50	—	—	—	—	—	—	—	—	422	4'74	4,207	3'93
Totals	788,413	12'72	1,130,634	18'85	263,796	4'30	620,230	10'33	23,031	0'33	5,477	0'09	9,353	0'15	5,693	0'09	481,594	8'03	3,308,721	4'59

MEMORANDUM.—The figures are quoted from Returns furnished by the Agents in India.

* It may be explained that these high figures include a large sum for cartage of goods, as well as for fire insurance.

† An incomplete return only has been received for the Khungam line.

RECEIPTS and EXPENSES per Train Mile in 1869 and 1870.

Railway.	Gross Receipts.		Expenses.																				Net Receipts.	
			Maintenance.		Locomotive.		Rolling Stock.		Traffic.		Rates and Taxes.		Personal Compensation.		Compensation for Damages.		Legal.		Miscellaneous.		Total.			
	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.
GUARANTEED.																								
East Indian:—Main Line - - -	8.14	8.66	7.03	7.66	14.99	14.96	3.67	4.21	8.83	8.64	0.15	0.13	0.01	0.00	0.07	0.19	0.04	0.02	5.97	7.63	3.39	3.62	4.75	5.04
„ Jubbulpore Line - - -	5.29	5.45	13.52	10.24	37.42	28.24	8.89	4.27	7.77	6.01	0.01	—	0.00	—	0.05	0.07	0.01	—	6.05	7.16	5.72	4.66	<i>Dr.</i> 0.43	0.78
Great Indian Peninsula - - -	10.43	9.14	24.64	21.07	27.61	22.83	7.28	5.19	15.98	12.97	0.32	0.08	0.29	0.23	0.07	0.06	0.23	0.15	5.55	6.14	6.82	5.68	3.61	3.45
Madras - - - - -	7.58	6.60	16.61	11.72	15.69	15.45	1.35	1.98	6.55	6.93	0.06	1.94	—	—	0.00	0.22	0.00	0.16	4.87	3.33	3.72	3.47	3.86	3.12
Bombay, Baroda and Central India - - -	11.11	10.55	30.51	17.36	24.71	23.05	11.09	6.51	11.46	11.02	0.86	0.31	0.01	0.45	0.41	0.28	0.31	0.23	21.79	17.44	8.43	6.39	2.68	4.16
Scinde, Punjab and Delhi - - -	7.20	7.90	11.99	12.01	25.45	28.04	2.36	4.04	16.62	16.03	0.01	0.45	—	0.00	0.75	0.19	0.04	0.05	12.18	14.48	5.80	6.27	1.40	1.62
Great Southern of India - - -	4.70	5.92	10.97	11.36	12.72	15.57	2.12	2.35	4.20	6.35	0.04	0.95	—	—	0.02	0.02	0.01	0.00	5.05	6.08	2.97	3.55	1.73	2.36
Eastern Bengal - - - - -	9.10	9.77	12.13	12.71	15.43	16.46	2.55	7.19	16.07	15.37	0.82	1.62	—	—	0.33	0.03	—	0.25	5.60	11.63	4.41	3.44	4.69	4.32
Oude and Rohilkund - - - - -	6.76	8.24	10.71	13.65	22.52	23.20	4.83	3.90	16.86	15.62	—	0.30	0.38	0.80	0.40	0.16	0.01	—	10.64	13.14	5.53	5.90	1.23	2.33
Carnatic - - - - -	3.36	2.52	8.83	6.38	9.37	7.29	0.57	0.83	6.81	4.21	—	0.56	—	—	—	—	—	1.09	7.02	13.73	2.71	2.84	0.65	<i>Dr.</i> 0.32
STATE.																								
Calcutta and South-eastern - - -	4.64	3.80	23.33	11.43	20.19	17.95	1.72	1.64	17.36	12.24	1.29	0.91	—	—	—	0.00	0.00	0.17	17.12	8.75	6.75	4.01	<i>Dr.</i> 2.11	<i>Dr.</i> 6.29
UNGUARANTEED.																								
Nulhuttee - - - - -	7.39	8.07	12.73	10.87	16.35	15.49	7.20	5.63	8.83	10.50	—	—	—	—	—	—	—	—	7.79	4.74	4.40	3.93	2.99	4.13
	8.47	8.49	14.09	12.72	19.70	18.35	4.49	4.39	10.75	10.33	0.23	0.33	0.07	0.09	0.10	0.15	0.09	0.09	7.07	8.03	4.72	4.59	3.74	3.90

MEMORANDUM.—The figures are quoted from Returns furnished by the Agents in India.

53. The train mileage receipts of the various lines vary from 3·80s. on the Calcutta and South-eastern, to 10·55s. on the Bombay, Baroda and Central India, the East Indian and the Great Indian Peninsula being at about the average, between 8s. and 9s. The train mileage expenses also vary, and bear a different proportion to the receipts in almost every case. While those of the Bombay, Baroda and Central India, and the Scinde, Punjab and Delhi, are at 6·39s. and 6·27s., those of the East Indian, the Madras, and the Great Southern of India are at 3·62s., 3·47s. and 3·55s. respectively. Thus the net mileage receipts of the East Indian main line are brought to 4·82s., the Great Indian Peninsula to 3·30s., the Madras to 2·88s., the Bombay, Baroda and Central India to 3·96s., the Eastern Bengal to 4·20s., and the Scinde, Punjab and Delhi to 1·54s. A comparison of the departmental charges on the different lines may help to indicate where there is room for improvement. The Bengal lines at present have an advantage over those on the west coast and in Madras in respect of the supply of coal for fuel, but there appears to be no sufficient reason why the locomotive departments of the Great Indian Peninsula, and Bombay, Baroda and Central India Railways should be 22·33d. and 23·05d. per train mile respectively, while those of the Madras and Great Southern of India are 15·45d. and 15·57d. The traffic charges likewise in some cases present a contrast which seems to call for explanation. On the Scinde, Punjab and Delhi Railway the traffic expenses per mile reach 16·03d.; on the Oude and Rohilkund 15·62d., and on the Eastern Bengal 15·37d.; while on the East Indian they are 8·64d., on the Madras 6·93d., and on the Great Southern of India 6·35d.

54. With regard to fares, 1s. 8½d. does not seem a high charge for third-class passengers travelling 58 miles, or 1s. for fourth-class passengers going 40 miles; but the distances are long average journeys for these classes, and seem to suggest whether lower fares would not attract a large number who may now probably walk, or otherwise use the road, for short distances.

The rates and fares now in existence are given approximately in the following table:—

Railway.	Passengers, per mile.					Goods, per ton per mile.							
	First Class.	Second Class.	Intermediate Class.	Third Class.	Fourth or Coolie Class.	1.	2.	3.	4.	5.	6.	Special.	
GUARANTEED.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.		
East Indian	2½	1½	1/8	3/8	—	1	1½	2½	2½	3	—	On most lines there are special low rates for certain articles.	
Great Indian Peninsula	2½	1½	—	3/8	1/8	1½	1½	3	4½	6	—		
Madras	2½	1½	—	3/8	1/8	1½	1½	2½	3	4½	—		
Bombay, Baroda and Central India	1½	1	—	3/8	—	1	1½	1½	2½	3½	5		
Scinde, Punjab and Delhi	2½	1½	—	3/8	—	1½	1½	2½	3	3½	—		
Great Southern of India	2½	1½	—	3/8	—	1½	2½	3	4½	6½	—		
Eastern Bengal	1½	1	1/8	3/8	—	1	1½	2	3	6	—		
Oude and Rohilkund	2½	1½	—	3/8	1/8	1½	1½	2½	3	3½	—		
Carnatic	1½	1	—	3/8	—	2	2½	3	4½	6	—		
STATE.													
Calcutta and South-eastern	—	1½	—	3/8	—	—	—	—	—	—	—		
Khangaum	2½	1½	—	3/8	1/8	—	—	—	—	—	—		
UNGUARANTEED.													
Nulhuttee	—	—	—	—	—	1½	2½	3	4½	9	—		

55. The fuel question is always an important one in connexion with the working expenses of Indian railways, and it is satisfactory to find that native coal will soon be more extensively used. The coal from the Nerbudda fields is at length likely to be available for the railways in Central India. A tramway from the pits to the Great Indian Peninsula Railway is now being laid down, and the railway company has engaged to take a certain quantity monthly at a fixed price. Sanguine hopes are also entertained with respect to the Chanda coalfields, specimens from which have been favourably reported on after experiments with them. The mines are situated to the south of the Nagpore branch of the Great Indian Peninsula Railway, and a line is being laid down by the Government with the main object of obtaining a good supply of fuel from this source. With these aids a considerable reduction should take place in the working expenses of the locomotive department of the Great Indian Peninsula line, and more favourable results produced by the traffic.

56. A regular system has been organised in the Madras Presidency for obtaining an adequate supply of wood fuel for railway purposes. It has been estimated that

nearly 100 square miles will be required to meet the demand; and already measures have been taken by the Forest Department for demarcating 26 miles in the districts of Cuddapah, North Arcot, Salem, and Coimbatore, to be used for the cultivation of trees suitable for the working of the railways. Similar measures have also been adopted in the Punjab and Scinde.

Conference.

57. While the carriages and vehicles used on the Indian railways have in some measure been constructed so as to meet the peculiarities of the climate and traffic, the English type has generally been followed. The experience which has now been gained in India, and the hints which have been taken from America and the continent of Europe by officers who have examined the railway systems there, pointed to the advantage of bringing together this knowledge and experience, and applying them to a consideration of how the requirements and the specialities of Indian railways might best be met and provided for.

58. The Government of India accordingly convened a conference, composed of competent officers connected with the Government Railway Department and representatives of the railway companies, to discuss and pronounce opinions upon various questions affecting the management of the railways. The conference was held in January, and on this occasion was presided over by Major F. T. Taylor, R.E., Consulting Engineer to the Government of Bengal.

Subjects of discussion.

59. The principal subjects of discussion were the rolling stock and the system of working the traffic. With regard to the former, the conference decided that it would be desirable to have a joint passenger stock for the through service on all trunk lines; that certain additional contrivances for keeping out the heat and dust, and for otherwise adding to the comfort of travellers by night as well as by day, should be applied to passenger carriages. The goods waggons recommended were covered vehicles, weighing $5\frac{1}{2}$ tons, and capable of carrying $9\frac{1}{2}$ tons.

60. On the subject of "working," the conference agreed that the speed of ordinary passenger and mail trains should be limited to 20 miles an hour, including stoppages, and its general opinion was that "the line clear" system was a desirable one. Other minor questions also were considered, such as communication between passengers and guards, and the locking of carriage doors.

61. Such meetings as these are very useful, being calculated to produce uniformity and to promote the introduction of all such improvements in the general system of working railways as may be considered desirable by the most intelligent officers employed on railway duties. It is to be hoped, therefore, that arrangements will be made for holding them periodically and in different places.

I have now to refer briefly to each undertaking.

EAST INDIAN RAILWAY.

62. This undertaking has now been completed by the opening of the Chord line on the 1st January last. Its whole length is 1,502 miles, of which 399 miles are made with a double line. The distance from Calcutta to Delhi, its northern terminus, is $953\frac{3}{4}$ miles by the new direct line; by the circuitous route, via Rajmahal, it is 1,019 miles. The branch from Nynce, three miles from Allahabad, to Jubbulpore is 224 miles in length; and other minor branches make up the total mileage above given. The cost of the railway up to the end of March was 30,401,276*l.*, or 20,200*l.* per running mile and 16,000*l.* per mile of single road. Its gross earnings last year were 2,753,932*l.*, and its expenses 1,204,305*l.*, leaving a net profit of 1,549,627*l.*, or rather more than 5 per cent.

The train mileage receipts for the last two years have been 7·96*s.* and 8·44*s.* respectively, and the expenses 3·39*s.* and 3·62*s.* Surplus profits to the amount of 140,000*l.* were earned on the main line in the half year ending the 30th June.

In the Appendix will be found a note by the Company's Consulting Engineer, containing some interesting particulars relative to the working of this railway during last year.

GREAT INDIAN PENINSULA RAILWAY.

63. The north-east portion of this undertaking, which has its terminus at Jubbulpore, was completed in March 1870, and the south-east line has recently been opened to Raichore, where it joins the Madras Railway. The bridge over the Kistna river, however, still remains to be finished, as well as the restoration of other viaducts and masonry works on various portions of the line. Until all this has been done, the railway cannot be regarded as complete; but its whole length of 1,272 miles, of which 287 are double, is sufficiently finished to enable the traffic to be carried on. During the past year 385 miles have been added to the open line. The capital ex-

penditure up to the 31st March had been 22,417,464*l.*, and if the estimated total expenditure of 26,000,000*l.* is correct about 3,500,000*l.* more will be required. The cost per mile open will then amount to 20,400*l.*, or 16,670*l.* for each mile of single line; but it seems probable now that the works will be completed for a less sum than was expected.

64. The gross receipts during the year 1870 were 1,659,947*l.*, and the expenses 1,032,630*l.*, leaving a net revenue of 627,317*l.*, as compared with 481,016*l.* of the previous year. There has been a considerable falling off in some of the principal articles of commerce, such as cotton and grain, in consequence of the state of trade. The maintenance and working charges continue high, having been 61·90 per cent. of the gross receipts.

MADRAS RAILWAY.

65. The whole of this undertaking, with the exception of the branch from Coimbatore to the Neilgherry Hills, is now completed. Seventy-six miles were added during the year 1870, and since the beginning of the present year the north-west line to Raichore, where it joins the Great Indian Peninsula Railway from Bombay, has been opened, and the branch to Bellary has likewise been finished. The whole length upon which traffic is now carried is 832 miles; consisting of the south-west line to Beypore and the Bangalore branch, 492 miles; the north-west to Raichore and branch to Bellary, 340 miles. The plans for the Neilgherry branch have not yet been approved by Government. The accounts of the south-west and north-west lines were until June last kept separate, but arrangements were then made for amalgamating them, and it is now one undertaking in every sense. For the first time, an accident of a very serious nature, involving the loss of eight lives, occurred on this line during the past year. It was caused by some piers of the bridge over the Cheyair river giving way, and has been noticed in the early part of this Report. The capital account on the 31st March showed an outlay of 9,748,135*l.*, being at the rate of 11,600*l.* per mile.

66. The traffic returns during the year have not been satisfactory. The depressed state of trade and the outbreak of epidemics in certain districts have injuriously affected the traffic. Compared with the previous year, which was influenced by similar causes, the gross receipts decreased from 562,630*l.* to 493,213*l.*, and the expenditure from 276,618*l.* to 259,693*l.*

BOMBAY, BARODA AND CENTRAL INDIA RAILWAY.

67. All the construction works on the original line, with the exception of the terminus at Bombay, having been now nearly completed, the principal operations in this undertaking are confined to the branch to Veerungaum, which was commenced last November. The 77½ miles embraced in this line were let out in four contracts, and the first, from Sabarmuttee to Samund, has already been opened for traffic. The moderate cost of this branch will diminish the high mileage rate of the whole line, the outlay on which up to the 31st March had been 7,436,158*l.*

68. The results of the traffic during the year have, upon the whole, been satisfactory. The earnings have increased, and the working charges have diminished. The gross receipts in 1870 were 493,098*l.*, compared with 299,492*l.* in the previous year, and the expenditure 298,526*l.*, as compared with 241,026*l.* The working and maintenance charges were 60·54 per cent. of the gross receipts. The train mileage receipts have fallen from 11·02*s.* in 1869 to 10·35*s.* in 1870, and the expenses per train mile have also been reduced from 8·45*s.* to 6·39*s.*; but there is still room for improvement. The effect of lowering the third-class passenger fares and certain goods' rates has not been yet fully demonstrated, but the present year will probably exhibit the benefits of that policy. The sea competition is a difficulty which this railway has to meet, and low rates will only tempt the trader to use the railway. In the mouths of February and March last, 18,334 bales of cotton out of 45,640 were taken by sea.

SCINDE, PUNJAUB AND DELHI RAILWAY.

69. The three lines of railway and the Indus Flotilla, which comprised this undertaking, have during the past year been amalgamated under the above title, so that there is now one capital and one revenue account for all, and greater economy as well as simplicity in the management has been secured. The bridge over the Sutlej, which was the only link wanting to complete the line between Delhi and Lahore, was opened on the 15th October by the Maharajah of Puttiala, and a continuous

line of railway communication from Calcutta and from Bombay to Multan was thus established.

70. The capital account on the 31st March showed that 10,106,700*l.* had been expended on the united undertaking, which consists of 675 miles of railway and a flotilla for the navigation of 500 miles of the River Indus.

71. The gross receipts for the year amounted to 520,455*l.*, and the gross expenditure to 396,665*l.*, leaving 123,790*l.* as net earnings, compared with 78,836*l.* for the previous year.

Bray arbitration.

72. The great arbitration case in which this company was concerned has at length been terminated by a compromise. The claim made by Mr. Bray, the contractor, against the company was for 213,595*l.* Proceedings commenced about 10 years ago. A sum of upwards of 34,000*l.* has been expended by the company in law charges, and the claimant has now accepted 45,000*l.* as a settlement.

GREAT SOUTHERN OF INDIA RAILWAY.

Tuticorin extension.

73. Although the surveys, plans, and estimates of the extension of this line to Tuticorin have been completed for some months, no commencement has been made with its construction. The question of gauge has had something to do with this delay, the Government having had under consideration whether the narrow gauge would not be suitable for the 210 miles embraced in the extension. As soon as this point is decided it is to be hoped active operations will immediately commence.

74. The capital expended on the open portion of this line to the 31st March last was 1,454,666*l.*, being under 9,000*l.* per mile.

75. The gross receipts on the open line during the year 1870 were 70,962*l.*, the expenditure being 42,646*l.*, and the net earnings 28,316*l.*, compared with 25,643*l.* of the previous year. The slight increase thus shown was entirely due to the merchandise traffic, that of passengers having fallen off.

EASTERN BENGAL RAILWAY.

Goalundo extension.
Goraie bridge.

76. The section between Kooshtee and Goalundo was opened on the 31st December last by the Governor General in person. The bridge over the Goraie river, which has been constructed under the superintendence of Mr. Bradford Leslie, is a work of considerable magnitude, and the successful manner in which all difficulties have been overcome reflects great credit upon Mr. Leslie and those employed with him. Its length is 1,760 feet, and it consists of 7 spans of 185 feet, and 10 of 45 feet. It is supported on iron cylindrical piers 138 feet long, some of them being 40 feet under the bed of the river. During its construction one of the piers was swept down by the force of the floods and has not been found since. The Eastern Bengal Railway is now 159 miles in length. The new northern terminus at Goalundo is situated at the confluence of the rivers Ganges and Brahmapootra, and is expected to become an important depôt for the produce of Eastern Bengal by intercepting the river traffic on its way from up country. The receipts from the line since the extension was completed afford promising hopes for the future. The capital expenditure up to the 31st March amounted to 2,860,667*l.* Some few additional works are being executed, but no very large outlay will be required, and the line when finished will probably have cost 18,000*l.* per mile.

Proposed extension.

77. Its extension still further to Darjeeling has been proposed, and plans for carrying it out are now under the examination of Government.

78. The gross earnings last year were 178,092*l.*, as compared with 166,338*l.* of the year 1869. The gross expenditure in the two years were 99,187*l.* and 80,599*l.* respectively, leaving the net profits for 1870 at 78,905*l.*, and for 1869 at 85,739*l.*

OUDE AND ROHILKUND RAILWAY.

Construction.

79. While construction operations have been vigorously carried on during the year, no addition has been made to the open line, which is still limited to the section between Cawnpore and Lucknow. The completion of the bridge over the Ganges at Cawnpore will unfortunately be deferred for another year, in consequence of the alterations which were considered to be necessary in the construction of the piers. It is expected that certain portions of the line will be shortly opened for traffic, the first being that from Lucknow to Byram Ghat.

80. The gross earnings on the open line amounted to 24,583*l.*, and the ordinary maintenance and working charges were 17,605*l.*, but of the expenditure which has been incurred in replacing the original light permanent way with rails and sleepers of a heavier description, a sum of about 40,000*l.* is regarded as a revenue charge, and will have to be paid out of future earnings.

CARNATIC RAILWAY.

81. The surveys and plans for the extension of this line have been made, but the sanction of the Government has not yet been given to the commencement of operations. It has been proposed to construct it with the 3-feet 3 $\frac{3}{4}$ -inch gauge, at an estimated cost of 4,900*l.* per mile. No further delay, it is to be hoped, will occur in laying out the line and proceeding with the works.

THE STATE RAILWAYS

82. Have been described in the early part of this report, with the exception of the Calcutta and South-eastern, leading from Calcutta to the Mutlah, which was surrendered to the Government by the company which constructed it, and is not yet in a prosperous condition, the results of the working during the year again exhibiting a small loss. Calcutta and South-eastern.

SUMMARY AND CONCLUSION.

83. It now only remains for me to recapitulate briefly the particulars given in the foregoing pages.

84. The extent of railway communication now open in India is 5,051 miles, of which 557 miles were completed last year, and 211 since the beginning of the present year. The three presidency towns and the capitals of the North-West provinces, and of the Punjab are now united, and the system of trunk lines laid out by Lord Dalhousie may be regarded as completed. This has been effected at a cost of about 70,000,000*l.*, and profits at the rate of about 3 $\frac{1}{2}$ per cent. upon this sum were earned last year. A further sum of about 18,000,000*l.* has been expended upon the other lines open for traffic and upon those which are in progress, making a total outlay of 88,000,000*l.* upon railways up to the 31st March last. Miles open.
Cost.

85. Materials to the value of more than 28,000,000*l.* have been sent out from this country for the railways since their commencement; and 263,499 tons, purchased for 1,611,512*l.*, were despatched last year. There are now nine companies, representing 51,887 shareholders, 5,367 bond or debenture holders, and 1,392 holders of debenture stock. Of this number 51,519 are Europeans, and 368 natives of India. Shipments.
Proprietors.

86. It has not been a good year for traffic. The gross receipts were about 6,214,000*l.*, of which 1,924,000*l.* was obtained from passengers, and 4,150,000*l.* from the conveyance of goods, &c. The expenses amounted to about 3,363,000*l.*, leaving a net revenue of 2,846,000*l.*, showing an excess of 340,000*l.* over last year; but the mileage open and the capital expenditure have increased in a greater ratio. Traffic.

87. The amount paid by the Government for guaranteed interest last year was 4,212,577*l.* The net receipts fall short of this, leaving a sum of about 1,366,000*l.* to be borne by the revenues of the country. During the first half of the year the East Indian Railway Company earned surplus profits, and divided with the Government a sum of 130,094*l.* 13*s.* 3*d.* therefrom. Guaranteed interest.
Surplus profits.

88. The results produced on some of the lines were satisfactory. On others there is room for improvements especially in regard to the reduction of working expenses. While the expenditure of some was in the proportion of 42 per cent. of the gross receipts, that of others was as high as 79 per cent. The train mileage receipts varies from 10*s.* 5*d.* to 2*s.* 5*d.*, and the expenses from 6*s.* 3*d.* to 2*s.* 8*d.* Working.

89. Of the 18,224,859 passengers conveyed, 92*·*73 per cent. were of the lowest classes; 6*·*52 per cent. second class; and 7*·*5 per cent. first class. Compared with last year, there was an increase of 1,800,000 in the number of passengers. Goods to the amount of 3,435,269 tons and 425,057 head of live stock, were carried, compared with 3,359,792 tons and 430,983 head of live stock carried in the previous year. Passengers.
Goods.

90. Accidents have not been so numerous as in previous years, but a very serious one occurred on the Madras line, by which eight lives were lost. A bridge over a

river gave way, and a train was precipitated into the water. During the whole year 13 passengers lost their lives, and of these nine through causes within their control.

Conference.

91. A conference of Government and railway officers was held during the year, and several minor questions connected with the working of the lines and the character of the rolling stock were discussed and settled. This will probably be the first of a series of such meetings, and much advantage may be expected from them.

New gauge.

92. The new gauge for certain future undertakings has been fixed at 3 feet 3 $\frac{3}{4}$ inches, that is, the French metre. Most of the State lines will be constructed on this scale. While the question of gauge was under consideration operations in connexion with the Government works were, with one or two small exceptions, kept in abeyance. Surveys have, however, been made of certain lines, for which estimates and designs are being prepared, and the promise of considerable progress during the next two or three years has been given.

I have the honour to be,

My Lord Duke,

Your Grace's very obedient humble servant,

JULAND DANVERS.

APPENDIX.

NOTE BY MR. RENDEL, ON THE WORK DONE BY THE EAST INDIAN RAILWAY IN THE YEAR 1870.

The company carried 5,137,744 passengers of various classes, and 1,170,658 tons (for the public) of minerals and goods, one fourth being minerals, besides parcels, horses, dogs, and mails, and fuel and other materials for the use of the line itself.

The company received for the transport of passengers, excluding special trains, the sum of 629,203*l.* 6*s.* 6*d.*, and for the transport of goods and minerals 1,831,526*l.*

From details of this traffic furnished by the company's officers it has been ascertained that the work done for the public in the carriage of passengers and goods represented approximately 397,391,526 passengers and 389,017,920 tons of goods and minerals carried one mile.

The average rate per mile therefore paid by passengers, taking all classes together, was approximately $3\frac{2}{10}$ pies, or, at the exchange of 1*s.* 10*d.* per rupee, $\cdot 38$ of a penny. The average rate paid by goods, including terminals, was approximately $\frac{1}{10}$ ths of a pie per maund, or in English money and weight 1·13 pence, or say 1½*d.* per ton.

The train mileage run during the year according to the audited returns was,—

Passenger trains (excluding special troop)	-	2,182,155 train miles.
Goods	-	3,879,935 "

The receipts therefore per train mile were,—

From passenger trains, for passengers only	-	5 <i>s.</i> 9½ <i>d.</i> per mile.
From goods and minerals carried for the public in goods trains	-	9 <i>s.</i> 5½ <i>d.</i> "

The average number of passengers and of tons of goods in any train at any one time must therefore have been (dividing the average mileage receipts by the average rates per mile) 182 passengers in passenger trains, and 100 tons of public goods in goods trains.

These figures do not, however, represent the whole work done by the trains. The passenger trains carried parcels, mails, horses, carriages, and dogs. The goods trains, again, carried very large quantities of coals and railway materials for the working of the line, for which no payment is made.

The receipts from these sources of coaching traffic amounted to 94,811*l.*, which, if supposed to have been paid by passengers, would at the average rate before given raise the total number of passengers carried one mile to 457,272,000, the average mileage receipts from passenger trains, including special trains, to 6*s.* 7½*d.*, and the average number in any passenger train at any one time to 209.

The railway materials carried for working purposes in the year amounted to 250,834 tons, chiefly coal. This weight was carried in the ordinary goods trains, with the assistance of 404,487 train miles run by the locomotive department. Assuming that this tonnage, if charged for, would have been carried at the ordinary special rate of $\frac{1}{4}$ pie per maund per mile, that is, for rather more than $\frac{1}{4}$ *d.* per ton, and that it was carried an average distance of 360 miles, the average charge for all kinds of goods would be reduced to $\frac{1}{3}$ rd of a pie per maund, or, in English money and weight, to 1·03 pence per ton per mile; the average receipts per train mile would be raised to 9*s.* 11*d.*; and the average load of each goods train to 115½ tons.

This load is materially below the maximum carrying power of the trains, which would be about 240 tons, mainly (1) because full train-loads can rarely if ever be obtained in both directions, (2) because the bulk of the mineral traffic necessarily involves empty return trains.

The cost of working, excluding Indian income tax, amounted per traffic train mile to 3*s.* 6*d.* Taking the train loads at 209 passengers for passenger and 100 tons for goods trains, and the cost of working both classes of trains to be the same, it follows that the average cost of carrying a passenger was approximately 1½ pies, or $\frac{1}{4}$ th of a penny, per mile, and of carrying goods $\frac{1}{10}$ ths of a pie per maund, or rather more than $\frac{1}{10}$ ths of a penny per ton, per mile. Including the work done in the carriage of fuel, &c. for the line, the working cost per ton of goods would be reduced to $\frac{1}{10}$ ths of a pie per maund, or $\frac{1}{3}$ rd of a penny per ton.

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