

# REPORT

TO

THE SECRETARY OF STATE FOR INDIA IN COUNCIL

ON

## RAILWAYS IN INDIA,

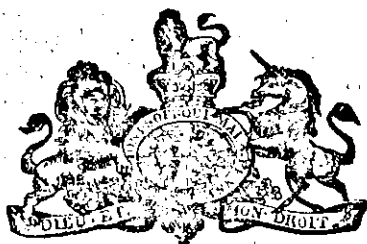
FOR THE YEAR

1869-70.



BY JULAND DANVERS, ESQ.,

GOVERNMENT DIRECTOR OF THE INDIAN RAILWAY COMPANIES.



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1870.

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Kabul  
AFGHANISTAN

BRITISH EMPIRE

Kobul

Lahore

Calcutta

Batavia

Bombay

Calcutta

Madras

ARABIAN SEA

### THE RAILWAYS OF INDIA

Statute Miles

Railways & Stations  
Proposed & in Progress

Andaman I.

CEYLON

INDIAN OCEAN

# REPORT.

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

MY LORD DUKE,

20th May 1870.

I HAVE the honour to lay before your Grace my usual annual report on the progress made in the construction of, and on the results of working, the Railways in India.

2. For the last ten years these reports have contained accounts only of operations which have been conducted through the instrumentality of Companies acting under the control of Government; but now, I shall for the first time have to refer to lines which have been undertaken and executed through the direct agency of Government. The operations, however, under this head are at present very limited, the various projects which were mentioned in my last report as those which were to be retained in the hands of Government being with one or two exceptions still under investigation.

3. The most important event which has marked the history of Indian Railways during this year is the junction of the Great Indian Peninsula and the East Indian Railways at Jubbulpore, whereby the whole breadth of the Peninsula is spanned, and Bombay and Calcutta, as well as Bombay, Delhi, and Lahore, are brought into railway communication with each other. The East Indian Railway has been opened to Jubbulpore since 1867, but unforeseen delay occurred in the completion of the works of the Great Indian Peninsula Railway, and the long-desired junction of the two lines has been deferred in consequence. (The works have lately been pushed on with great vigour and rapidity, and although there is still much to be done before the line can be considered thoroughly completed, it was sufficiently advanced to admit of the ceremony of opening being performed by the Duke of Edinburgh and the Viceroy on the 7th March last. The occasion gave rise to proceedings of much interest, in which the Governor of Bombay; the Chief Commissioner of the Central Provinces; Sir Salar Jung, the Minister of His Highness the Nizam; Maharajah Holkar; the Maharajah of Rewah; the Rajah of Myhere; and other high functionaries, took part.) But as an account of them has reached your Grace through other channels it is unnecessary to give any details here. The line in question proceeds from Bombay up the Thull Ghât via Jubbulpore to Allahabad; thence it follows the valley of the Ganges to Calcutta. Before the end of the year a more direct route will be opened for the latter part of the line by the completion of the chord line of the East Indian Railway from Luckeseraï via Ranegungo to Calcutta. The distance from Bombay to Calcutta by the present route is 1,470 miles. It will then be 1,400 miles. The journey occupies about 70 hours. The fares, as near as I can ascertain them, are 1st class about 14*l.* 2nd class 7*l.*, and 3rd class, 2*l.* 13*s.* By means of this line a saving of three or four days in the journey between England and Calcutta has during the past year been effected. No greater time is now occupied in reaching Calcutta from London than it took twenty years ago to get from one end of India to the other.

Completion of transpeninsula line between Bombay and Calcutta.

4. I have been giving prominence, however, to a proceeding that took place after the close of 1869, to which period this report chiefly relates. During that year 261 miles were added to the 4,020 open at the beginning. An addition of thirty (30) miles was made to the North-west Madras line, and of two hundred and thirty-one (231) miles to the Delhi. Since the end of the year a short branch of 8 miles, which has been constructed by the Government, extending

Additions to lines in 1869.

from Jhelling on the Great Indian Peninsula Railway to the Cotton mart of Khamgaon, and 25 miles more of the Delhi line have been opened, besides 69½ miles, between Sholapoor and Goolburga, on the S.E. branch of the Great Indian Peninsula Railway, and the Jubbulpore line before mentioned. The short extension of the Baroda Railway across the Sabarmuttee river, and 2 miles beyond, was also opened on the 1st January last. The whole length of Railway now open in India is 4,628 miles.

General progress.

5. Other works have been progressing and several lines are on the eve of completion. The chord line of the East Indian will, as already stated, be finished in the course of this year. The line between Madras and Bombay, with the exception of the bridge over the Kistna, should also be opened next cold season. The Delhi line will probably be completed. The Oude and Rohilkund Company will open their first section beyond Lucknow, viz., to Byram Ghât; and the extension of the Eastern Bengal Railway to Goalundo, the progress of which has been impeded by the damage inflicted on the Goraie and Chundna bridge works by the cyclone in June last, will it is expected be ready for opening in the course of this year. Progress has also been made on the Punjab State line, which with the exception of a few diversions is to occupy one half of the trunk road. The lines which form the system of railways for Oude and Rohilkund have now all been sanctioned and staked out, and the earthworks have been formed over many miles. The bridges also have been put in hand, and permanent way material taken to different parts of the line. The Bombay, Baroda and Central India and the Great Southern Railway Companies have made every preparation for carrying out with vigour the extensions committed to them; and the Carnatic Company, which has taken the place of the former Indian Tramway Company, is making the surveys for the extension of the line to Cuddalore, and is about to convert the narrow gauge line between Arcunum and Conjeveram into a first-class railway, with the standard gauge of 5 feet 6 inches.

Length of lines sanctioned and opened.

6. Particulars as to the present and future length of the various sanctioned lines will be found in the following table:—

Railway.	Length sanctioned.	Length opened during 1869.	Length opened since Dec. 1869.	Total Length opened.	Portion laid with Double Line.	Length remaining to be finished.	
East Indian - { Main line - - - - -	1,278	—	—	1,131½	203	147	
	Jubbulpore line - - - - -	225	—	225	—	—	
Great Indian Peninsula - - - - -	1,272	—	311	1,164	256	86	
Madras - { South-west line - - - - -	522	—	—	492	—	30	
	North-west line - - - - -	340	30	215	—	125	
Bombay, Baroda, and Central India - - - - -	384	—	3	310½	20	74	
Scinde - - - - -	109	—	—	109	—	—	
Punjab - - - - -	246	—	—	246	—	—	
Delhi - - - - -	320	231	26	310	—	10	
Great Southern - - - - -	378	—	—	168	—	210	
Eastern Bengal - - - - -	159	—	—	114	—	45	
Oude and Rohilkund - - - - -	672	—	—	42	—	630	
Carnatic - - - - -	100	—	—	18	—	82	
State Lines. {	Calcutta and Canning - - - - -	28	—	—	28	—	—
	Northern Punjab - - - - -	173	—	—	—	—	173
	Khamgaon - - - - -	8	—	8	8	—	—
	Oomrawuttee - - - - -	7½	—	—	—	—	7½
Subsidiary. {	Nullattee - - - - -	27½	—	—	27½	—	—
Total - - - - -	6,249	261	347	4,628½	479	1,519½	

7. The following table, which has been extracted from an interesting statistical statement prepared by Major E. C. T. Williams, R.E., Deputy Secretary to the

Government of India, shews the gradual progress which has been made in each year by each company since the commencement of operations in India ;— Annual progress from commencement.

Railways.	Length of Line open at the end of Years																
	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1st Oct. 1869.
East Indian Railway (including Subulporc)	—	87½	120½	120½	120½	141	284½	367½	560½	863½	987	1,105½	1,129½	1,129½	1,353½	1,353½	1,353½
Great Indian Peninsula	21½	34½	50½	88½	88½	194½	245½	297½	437½	494½	558	585½	701½	815½	853	875½	875½
Madras	—	—	—	66½	80½	95	95	180	397½	447	447	571	611	645	645	677½	707½
Bombay, Baroda, and Central India	—	—	—	—	—	—	—	35	132	186	185	305½	305½	305½	305½	305½	305½
Scinde	—	—	—	—	—	—	—	—	105½	105½	105½	105½	105½	108½	108½	108½	108½
Punjab	—	—	—	—	—	—	—	—	—	38	45	45	253	253	240	240	240
Delhi	—	—	—	—	—	—	—	—	—	—	—	—	—	—	53	53	244½
Great Southern of India	—	—	—	—	—	—	—	—	49	79	70	79	79	127	144	168	168
Eastern Bengal	—	—	—	—	—	—	—	—	—	110	110	110	110	110	113½	113½	113½
Oude and Rohilkand	—	—	—	—	—	—	—	—	—	—	—	—	—	—	42	42	42
Nulhattee & Azimgunge	—	—	—	—	—	—	—	—	—	—	27½	27½	27½	27½	27½	27½	27½
Carnatic	—	—	—	—	—	—	—	—	—	—	—	184	184	184	184	184	184
Calcutta & South-eastern	—	—	—	—	—	—	—	—	—	15	28	28	28	28	28	28	28
Total	21½	72	171	274½	389½	480½	624½	830½	1,591½	2,351½	2,510½	2,962½	3,368½	3,593	3,937½	4,017½	4,238½

8. Some of the lines embraced in the above lists have been sanctioned during the past year and consist of extensions of, or branches to, railways in the hands of existing Companies. In making arrangements with them for the execution of the new works certain terms in the original contracts were modified. A more definite power of control was, for example, given to the Government over the operations of the Companies' officers in their preparation of the plans and estimates and while the lines were in course of construction; and it was arranged that any excess profits over 5 per cent. were to be equally divided between the Government and the Companies. It will be recollected that, as the clause relating to profits originally stood, it was provided that in the event of the amount which had been advanced by Government for the guaranteed interest being repaid with interest, the whole of the net profits should go to the shareholders. The Government now arrange to keep no account of guaranteed interest as against the Companies, and to cancel the past debt, which was accumulating at a rate to leave little hope of the ability of the Companies to pay it off within the terms of their leases. The Companies which have agreed to this arrangement up to the present time are the Great Indian Peninsula; the Madras; the Bombay, Baroda, and Central India; the Scinde, Punjab, and Delhi; the Great Southern of India; and the Carnatic. The first three have been informed that the Government will waive its right to purchase their lines at the expiration of the first 25 years of their leases, which occurs, in the case of the Great Indian, in 1874; of the Madras, and Bombay and Baroda in 1880.

Modified terms of new contracts with Companies.

9. With regard to lines in the hands of Government and which are termed "State Railways," one, the Calcutta and Canning Town, was surrendered to the Government by the Company which constructed it; another, the Jhellum and Khamgaon, was executed under the directions of Government officers in the space of nine months, and is being worked by the Great Indian Peninsula Railway Company; the third, viz., the Lahore and Peshawur line, is being laid out and constructed under the superintendence of Mr. Lee Smith. The principle followed in the construction of this line is to commence it on a most economical scale and to make improvements gradually as the traffic justifies fresh outlay and calls for greater conveniences. The way is to be single, the works substantial and suited for a speed of 15 miles an hour, and all adjuncts and buildings are to be of the most simple and inexpensive kind. The general rules which have been laid down for the guidance of officers engaged in the railway operations of Government are given in the Appendix.

State lines.

10. The lines which are now being surveyed by the Government in view to their early commencement are, 1st, from Delhi in a southerly direction to Rewaree, with a branch to Furrucknuggur, where valuable brine springs exist; 2nd, from Agra to Sambhur salt lake, and on to Ajmeer, forming a junction at some point to be determined on with the above-mentioned line from Delhi; 3rd, from Mooltan by the valley of the Indus to Rohree; 4th, from Koolburga to Hyderabad;

State lines under survey.

State railways. 5th, from Karwar to Hooblee. No estimates have yet been made of the cost of the lines to be undertaken by Government, nor has it been considered necessary to make any special provision for the raising and issuing of money for the purpose. In the Loan Bill of last Session it was at first proposed that 1,000,000*l.* should be raised for "the purpose of the construction of Railways in India, and "for no other purpose whatsoever," but the clause was expunged from the Bill before it passed the House of Commons.

Expenditure on State railways. 11. In order to establish a proper system of accounts at starting, rules have been laid down for the guidance of all those who are engaged on the State railways. The accounts are to be kept distinct from those on other public works. A separate account will be kept for each railway. The expenditure is to be divided under 18 different heads. The rules are very complete and seem calculated to ensure method and accuracy in the preparation and rendering of periodical statements, as well as to provide checks against carelessness and irregularity in the conduct of the works.

Goolburga to Hyderabad line. (12. The line between Goolburga and Hyderabad has just been mentioned as a State line, and in one sense a State line it will be, although not paid for by the Government. The gratifying announcement has lately been made by the Government of India that Sir Salar Jung, the chief minister of His Highness the Nizam, has engaged to provide a million of capital for the construction of this line, which is to be executed and managed by the Indian Government for the Nizam. The Government have at the same time communicated the satisfactory intelligence that His Highness the Maharajah Holkar has also arranged to advance a million sterling for the branch to Indore from the Great Indian Peninsula Railway, the British Government allowing him 4½ per cent. interest upon the loan, and dividing with him rateably on the share of the outlay contributed by him the profits over and above that rate.)

Branch line to Indore. Light railways suitable in certain places. 13. It is a question worthy of serious consideration whether some of the future lines, which will not form part of the system of main trunk lines, but which will be branches and feeders to them, may not advantageously be constructed of a much narrower gauge and be altogether of a lighter description than the existing lines. Hilly and mountainous districts and places requiring railway communication, but where the traffic would be comparatively small, may be admirably served, it is thought, by a light 2 feet 6 inch or a 3 feet line, which should be made for a third or a quarter less than one with the standard gauge. And if the results exhibited on the Portmadoc and Festiniog Railway in Wales, with a gauge of 2 feet, are borne out by more extended investigation and by further practical tests, the double bogie engine, constructed on the plan designed by Mr. Fairlie, seems likely to assist in promoting the introduction of railways into places where it has hitherto been considered to be out of the question to take them in consequence of the expense. For by combining the narrow gauge with the double bogie locomotive it appears that a line may be taken up steep gradients and round sharp curves at a comparatively small cost, and worked with ease and economy. The experiments in Wales above referred to, were witnessed by a Commission of Russian Noblemen and Engineers, headed by the Count Bobrinsky; by a deputation from this office, consisting of Major-General Sir William Baker, K.C.B., Mr. William T. Thornton, the Secretary in the Public Works Department, and myself; by Captain H. W. Tyler, of the Board of Trade, and by several engineers from Sweden, Germany, and this country. The Duke of Sutherland also accompanied the expedition, and took a prominent part in the proceedings. The results have already been furnished to your Grace, and have been forwarded to the Government of India. The report of Captain Tyler to the Board of Trade is given in the Appendix.

Festiniog Railway. 14. An interesting account of the Festiniog 2-feet Railway, containing full particulars both with respect to its construction and working, has been written by Mr. C. E. Spooner, the Engineer and Manager of the line. Copies of this paper have been sent out for the information of the authorities in India. Mr. Spooner is an advocate for light and narrow gauge railways, and he gives the following summary of the advantages of the system, which is doubtless applicable to certain situations and circumstances, though not to all:—

1st. The large comparative saving in first construction.

2nd. The large proportion of paying load to non-paying or tare weight of train.

3rd. The great reduction in wear and tear of permanent way, through advantage gained by light rolling stock.

4th. Saving in reduced wear and tear of wheel tyres from reduced weight on each wheel.

5th. Large proportionate increased power of locomotives.

6th. Proportionate increased velocities gained by the light system.

7th. Greater economy in working traffic.

8th. Comparative increase in capabilities of traffic.

9th. Great advantages gained by application of the Fairlie system of locomotive engines in concentrated power, equalisation of adhesion of all the wheels to the rails, economy from reduced friction on wheel flanges, reduction of wear and tear to the permanent way, great saving in fuel, and economy in wages for given power secured.

15. Another investigation, which is likely to be of service to the cause of Indian Railways, was made during the past year by Major F. S. Taylor, R.E., the Consulting Engineer to the Government of Bengal. When in this country he was commissioned to visit America, Belgium, and France, and to examine and report on the system of railway construction and management pursued in those countries. The results of his observations and inquiries have been given to the Government, and go to show that in several respects India may learn something from Europe and America. With the view of bringing the experience of the latter to bear practically upon the railway operations that are now going on in India, two practised engineers from America have been engaged in the service of the Government.

Major Taylor's reports on foreign railways.

16. The year 1869 was not free from floods which either damaged or destroyed certain railway works. The Muller viaduct on the Scinde line, which was carried away in 1866, was again swept down by the violence of the torrent. The scour in the bed of the Goraie river, over which the Eastern Bengal Railway is carried, was, during the cyclone of June, so great as to undermine two iron cylinders of one of the piers, which fell over in consequence. The cylinders, which were 40 feet in length, and weighed, including brick work, upwards of 100 tons, had been sunk 10 feet into the soil. One of them was recovered shortly after the accident, but all efforts to recover the other have been unsuccessful.

Floods in 1869.

17. It was mentioned in last year's report that it had been determined to construct an ordinary bridge over the Hooghly at Calcutta so as to make the Howrah terminus of the East Indian Railway accessible to the Calcutta side of the river. By an ordinary bridge was understood a permanent one with a superstructure of iron. Your Grace has however determined, upon the recommendation of the Government of India, that a pontoon bridge, which will be of much less cost, shall be constructed.

Bridge over the Hooghly at Calcutta.

#### PROCEEDINGS IN THIS COUNTRY.

18. The materials sent from this country during the year have consisted principally of rails and sleepers for the Punjab Northern State Railway and the Oude and Rohilkund Railway, and of iron girders for the bridges connected with those lines. The prices paid have been rather below the average. The stores despatched by the other companies have been chiefly for purposes of maintenance and working. The quantity annually required for those objects has now become very large. The fuel alone at present provided is considerable. Last year it was not so much as usual, in consequence of the supplies from the Abyssinian expedition coming into use. Coal and coke to the amount of 45,530 tons were sent out, and cost, on arrival, 97,819*l*. Great hopes are, however, now entertained that fuel for lines in Central India, if not for Madras and Bombay, will be obtained from the Nerbudda coal mines and from some recently discovered beds near Chanda, about 80 miles south of Nagpore. If these hopes are fulfilled, a considerable reduction would take place in the quantity exported from this country to India. The rails recently supplied have been lighter than those which were sent in the first instance for the main lines. Formerly they were 84 lbs., now they are 60 lbs. to the yard; and this again may be reduced if steel is used. Steel rails of 45 lbs. have been recommended by Mr. C. D. Fox, the consulting engineer to the Carnatic Railway Company, as being adapted for maximum rolling loads of four tons per wheel. He states that they have been used with satisfactory results on lines in the United States and Canada, and are being adopted largely in South America. It must be admitted that the present price of steel is a temptation to use them. Rails which were formerly 20*l*. a ton may now be had for 10*l*. or 11*l*. a ton, which is only from 2*l*. to 3*l*. in excess of iron. If the saving of freight and the superiority of the metal is taken into account, a line may be laid with light

Materials for construction.

For working and maintenance.

Rails.



steel rails at the same cost as ordinary iron rails. The following table shows the amount shipped during the year 1869:—

Shipments during the year 1869.

SHIPPING OPERATIONS DURING THE YEAR 1869.

Railway Company.	Number of Ships employed in 1869.	Amount of Goods shipped in 1869.	Value of Goods shipped in 1869.	Amount paid for Freight and Insurance in 1869.	Rate of Freight and Insurance per Ton.	
					To	s.
East Indian	44	Tons. 24,538	£ 176,221	£ 40,642	Calcutta	33·10
Great Indian Peninsula	113	99,995	522,497	183,310	Bombay	36·
Madras	62	18,862	145,758	25,763	Madras	27·80
Bombay, Baroda, and Central India	28	7,951	41,641	14,321	Bombay	37·27
Scinde	8	99	1,807	273	Kurrachee	54·14
Punjab	20	1,113	22,913	3,121	"	56·
Indus Flotilla	9	305	4,461	726	"	47·70
Delhi	27	4,262	103,502	13,130	"	60·
Great Southern of India	5	2,500	16,610	4,103	Negapatam	32·40
Eastern Bengal	11	2,938	26,074	4,990	Calcutta	34·
Oude and Rohilkund	115	47,278	355,670	58,785	Calcutta	22·75
Carnatic	6	9	214	20	Madras	23·77
State Railways	7	1,900	15,416	2,250	Calcutta	23·68
<b>Total</b>	<b>455</b>	<b>211,750</b>	<b>1,432,784</b>	<b>351,974</b>		

19. One ship was wrecked during the year with a cargo of goods belonging to the Great Indian Peninsula Railway Company, valued at 7,673*l*. It was fully insured.

Shipments to present date.

20. The shipments from the commencement of operations are given in the following statement:—

Year.	No. of Ships.	Ships lost.	Amount of Goods shipped.	Value of Goods shipped.
Up to end of 1860	2,605	39	Tons. 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	—	102,318	1,018,164
" 1865	442	2	199,157	1,729,643
" 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
<b>Total</b>	<b>6,158</b>	<b>60</b>	<b>3,929,799</b>	<b>26,484,919</b>

Locomotive and rolling stock, 1869.

21. The following table shews what was the locomotive and rolling stock on the 1st January 1870:—

Railway.	Locomotives.			Passenger Carriages.		Trucks and Wagons.		Total Number of Vehicles on 31st December 1869.
	Former Number.	Added in 1869.	Total Number, 31st Dec. 1869.	Former Number.	Added in 1869.	Former Number.	Added in 1869.	
East Indian	514	23	537	900	1	6,430	132	7,463
Great Indian Peninsula	236	28	264	991	34	5,702	194	6,971
Madras	106	3	109	277	2	2,980	172	3,481
Bombay, Baroda, & Central India	63	—	63	181	2	2,874	—	3,057
Scinde	25	—	25	64	—	671	—	735
Punjab	38	—	38	116	—	669	—	785
Delhi	38	18	56	139	65	663	386	1,253
Great Southern of India	15	2	17	41	—	215	55	311
Eastern Bengal	43	—	43	100	24	563	77	764
Oude and Rohilkund	4	2	6	28	5	78	11	122
Carnatic	4	—	4	29	8	43	—	80
Calcutta and South-eastern	12	—	12	56	—	478	—	534
<b>Total</b>	<b>1,098</b>	<b>76</b>	<b>1,174</b>	<b>2,922</b>	<b>191</b>	<b>21,366</b>	<b>1,027</b>	<b>25,506</b>

22. The following statement shows that the number of persons who hold shares and debentures of Indian railways amounts to 56,417, being 2,918 in excess of 1870. last year:—

Railway.	Number of Shareholders on 31st December 1869.						Number of Debenture Holders.	Total Number of Proprietors on the 31st December 1869.
	Registered in England.			In India.				
	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 - - -	5,879	7,845	13,724	203	142	345	2,944	17,013
Great Indian Peninsula -	4,676	6,477	11,153	71	103	174	1,732*	13,227
Madras - - -	2,540	3,696	6,236	—	—	—	840	7,076
Bombay, Baroda, and Central India - -	2,029	3,356	5,385	14	69	83	1,002	6,470
Scinde - - -	640	1,050	1,690	13	3	18	140	1,843
Punjab - - -	676	1,085	1,761	19	2	21	120	1,902
Delhi - - -	1,484	2,316	3,800	45	6	51	—	3,851
Indus Flotilla - -	79	203	282	—	—	—	50	332
Great Southern of India	425	602	1,027	2	7	9	110	1,146
Eastern Bengal - -	641	998	1,639	22	23	45	444	2,128
Oude and Rohilkund -	516	559	1,075	11	20	31	74	1,180
Carnatic - - -	28	185	213	12	19	31	—	244
Total - - -	19,613	28,372	47,985	414	394	808	7,624	56,417

\* Including 168 holders of debenture stock.

### EUROPEAN STAFF.

23. It will be seen by the following table, which is again incomplete in consequence of the absence of returns from Bombay, that the number of Europeans and East Indians and natives employed on the lines in Bengal and Madras, on the 1st October last was 3,221 of the two former, and 35,422 of the latter. Thus nearly 10 per cent. were Europeans. One of the chief expenses connected with the working of railways in India is the high cost of European agency, and the time should now have arrived when the result of the instruction given to natives and Eurasians in the mechanical departments of a railway should be shewn. On the Madras Railway the system of apprenticing Indian-born youths as firemen, engine drivers, and mechanical workmen in the locomotive shops has succeeded admirably, and the aim of all should be gradually to allow native to take the place of highly paid European skill and labour. A certain proportion of Europeans will probably always be required, but they should be employed more in the positions of foremen and supervisors. To give an idea of the large amount earned by European drivers in India, I may mention that, while in England the maximum pay of a driver is 150*l.* a year, in India it has, by means of overtime earnings, reached 480*l.* a year. In England the average is from 110*l.* to 120*l.*; in India from 260*l.* to 280*l.* The actual charge in India of mechanical and skilled labour, is 5½*d.* per train mile run as against 1¾*d.* in England. Taking into account the passages of the Europeans, their furlough pay and failures from sickness and intemperance,\* the charge will be in the proportion of three in India to one in England. The number of miles run by trains last year in India was upwards of 12,000,000. If therefore the mileage rate could be reduced by one-third, so as to make it double that of English lines, it would produce a saving of 250,000*l.* a year.

24. There is no reason also why the more educated class of natives and Eurasians

\* On one line alone 25 men were discharged for drunkenness during the past year, and several lost their lives from the same cause.

should not fill the superior positions of Engineers, and Assistants in the Traffic and Locomotive Departments. This has already been done, I believe, on the Madras Railway.

PERSONS EMPLOYED ON LINES  
on the 1st October 1869.

Railway.	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.										
	Europeans and East Indians.		Europeans and East Indians.		Europeans and East Indians.		Europeans and East Indians.		Europeans and East Indians.		Europeans and East Indians.		Europeans and East Indians.		Europeans and East Indians.		Europeans and East Indians.		Europeans and East Indians.		Europeans and East Indians.													
	Natives.	Total.	Natives.	Total.	Natives.	Total.	Natives.	Total.	Natives.	Total.	Natives.	Total.	Natives.	Total.	Natives.	Total.	Natives.	Total.	Natives.	Total.	Natives.	Total.	Natives.		Total.									
East Indian	31	177	208	21	391	412	32	306	428	10	312	322	61	1,117	1,178	527	1,343	1,875	100	4,437	6,537	124	3,833	3,957	854	2,382	3,236	40	1,038	1,077	1,809	20,431	22,240	1,354
Eastern Bengal	8	52	60	3	68	71	1	22	23	16	16	6	31	37	62	946	1,008	64	2,091	2,145	5	168	173	44	367	411	3	84	87	186	3,355	4,041	113	
Calcutta & South Eastern (State)	5	1	6	1	6	6	1	1	—	1	13	14	5	76	81	5	160	165	—	6	6	6	6	6	21	20	—	12	12	23	295	317	28	
Oude and Rohilkund.	16	31	47	3	15	17	5	43	48	8	23	31	—	—	—	7	140	147	3	69	72	—	—	—	27	376	402	2	17	19	70	713	783	42
Punjab	20	40	60	26	46	71	17	37	44	1	124	125	15	233	248	101	848	949	44	112	156	12	340	352	106	542	648	46	94	129	397	2,655	2,842	433
Dellii	16	31	47	4	91	95	10	93	108	—	—	—	13	102	115	147	1,371	1,518	63	2,764	2,827	—	—	—	360	1,823	2,183	27	130	157	640	6,400	7,040	707
Madras	18	91	109	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Great Southern of India.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Carnatic	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	114	423	537	57	815	872	65	587	632	19	475	494	96	1,537	1,633	368	8,012	8,380	285	12,376	12,661	141	4,347	4,488	1,450	5,635	7,105	196	1,376	1,501	3,221	35,422	38,643	2,364

ACCIDENTS.

Accidents.

25. The list of casualties for the past year is a heavy one. Two accidents alone occasioned the death of 30 passengers and injury to 49 more. One was that which occurred at the reversing station of the Bhow ghât incline on the 26th January 1869, and which was described in the last report. The other took place at Etola, on the Bombay and Baroda line, on the 28th June. It was caused by the train running on a buffalo that had strayed on the line. The animal was struck by the cow-catcher, but not being full grown was thrown down, instead of being tossed off the line, and was drawn under the train. Two double-storied 3rd class carriages were smashed, 11 passengers were killed, and seven hurt. The result of investigation into the causes of the accident, was that "the accident was due mainly, to the inefficient state of the fencing which allowed the buffalo to stray on the line, and to the insufficiency of the cow-catcher to do the work for which it was designed."

26. The following tables, which have been compiled in India, furnish the number and nature of all the accidents that have occurred during the past and previous years. The number of passengers carried in 1869 is put down at 16,513,037. Out of these 31 or 1.87 per million lost their lives from causes beyond their control; and 4.78 per million were in like manner injured. Besides these, 17 were killed, and 13 injured through their own fault or incaution. With regard to the servants of the companies 109 were killed, out of whom eight met their deaths from causes beyond their control; trespassers to the number of 48 were also run over and killed. In addition to the deaths here recorded another remarkable list is given of persons who have died while travelling, or at stations when starting for their journey, or at the end of it. No less than 132 passengers were thus, during the half year, found either dead or dying. The most common cause ascribed is cholera. Heat apoplexy also took off several; chronic dysentery, fever, and asthma, others, but many deaths are attributed to "natural causes." It is possible that the fatigue of travelling and the heat may have accelerated death in some cases, but no complaint is made of overcrowding, and in all probability most of the sufferers started on their journey in a weak feeble state, some perhaps in the hope of reaching their homes or a sacred river or shrine and dying there.

TABLE No. I.

ABSTRACT of the NUMBER and NATURE of the ACCIDENTS and of the INJURIES to Life and Limb which have occurred on all Railways open for Traffic in India during the Year 1869.

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.		Killed.	Injured.	Killed and Injured.	
			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.						
Bengal.	1,254	East Indian -	1869	33	9	—	30	4	76	1	23	13	10	2	24	39	46	3	2	33	10	5	1	96	116	212
	1,245		1868	37	14	1	2	3	57	—	32	5	13	4	32	54	83	1	3	24	4	6	4	94	171	265
Ditto	113	Eastern Bengal	1869	—	2	—	—	1	3	—	—	—	—	—	3	9	—	—	2	—	—	—	—	6	3	9
	113		1868	1	—	—	—	—	1	—	14	6	—	—	—	—	—	—	—	—	—	—	—	19	7	26
Ditto	28	Calcutta and South-eastern.	1869	—	—	1	1	1	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
	29		1868	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ditto	42	Oude and Rohilkand	1869	—	4	20	6	3	33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	42		1868	—	—	—	—	—	—	—	—	—	—	—	1	2	6	—	—	—	—	—	—	—	—	—
Ditto	27	Nulhattee and Azimgunge.	1869	—	3	1	1	1	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	27		1868	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ditto	246	Punjab	1869	2	2	8	—	1	13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	246		1868	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ditto	195	Delhi	1869	4	4	7	—	3	18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	53		1868	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Madras	689	Madras	1869	1	9	2	34	4	50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	656		1868	—	2	10	—	1	13	—	—	2	4	—	—	1	10	10	—	—	—	—	—	—	—	—
Ditto	168	Great Southern of India.	1869	—	—	—	41	—	41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	168		1868	—	1	1	—	—	3	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ditto	19	Conjeveram Tramway	1869	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	19		1868	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bombay	872	Great Indian Peninsula	1869	31	94	11	25	22	183	19	43	1	—	2	3	25	32	—	—	7	2	—	2	54	82	136
	872		1868	20	71	2	6	14	113	—	—	2	3	5	14	23	32	—	—	12	5	2	1	45	55	100
Ditto	308	Bombay, Baroda, and Central India.	1869	6	16	—	106	3	131	11	13	1	—	—	1	12	10	—	—	1	1	—	—	25	25	50
	306		1868	3	7	—	17	—	27	1	—	—	—	—	—	2	9	10	—	—	2	—	—	13	15	28
Ditto	109	Scinde	1869	1	6	2	3	2	14	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	3
	109		1868	2	2	—	8	12	24	—	—	—	—	—	1	—	2	—	—	—	—	—	—	—	—	4
India	4,170	-	1869	78	149	52	248	45	572	81	79	17	13	8	34	101	112	6	2	48	15	5	3	216	258	474
	3,958		1868	64	104	27	34	30	259	16	42	19	22	10	50	100	139	3	3	45	13	9	5	192	274	466

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11

TABLE NO. II.—NUMERICAL ABSTRACT of ACCIDENTS of all Classes on all Railways open for Traffic in India during the Year 1869.

	BENGAL, NORTH-WESTERN PROVINCES, OGDH AND PUNJAB.												MADRAS.						BOMBAY.						Total.					
	E. Indian.		E. Bengal.		C. & S. E.		O. & R.		N. & A.		Punjab.		Delhi.		Madras.		G. S. OF I.		Conjeveram Tramway.		G. I. P.		B. B. & C. I.		Scinde.		Total.			
	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.	Killed & Injured.	
<b>PASSENGERS.</b>																														
<i>From causes beyond their own control, viz. :—</i>																														
From accidents to trains - - -	1	23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
From other causes - - -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Total - - -	1	23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Per million of passengers -	0.19	4.53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
<i>From their own misconduct or incaution</i>																														
Per million of passengers -	13	10	1	—	—	—	—	—	1	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Total from all causes -	14	33	1	—	—	—	—	—	1	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
<b>SERVANTS OF COMPANIES OR OF CONTRACTORS.</b>																														
From causes beyond their own control -	2	24	—	—	—	—	1	—	—	—	1	—	3	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
From their own misconduct or incaution	39	46	3	3	—	—	2	6	—	—	1	—	9	2	10	10	—	—	—	—	—	—	—	—	—	—	—	—	—	
Total from all causes -	41	70	3	3	—	—	2	7	—	—	2	—	12	7	10	10	—	—	—	—	—	—	—	—	—	—	—	—	—	
<b>OTHER PERSONS.</b>																														
Crossing at level crossings - - -	3	2	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Trespassers, including suicide - - -	33	10	2	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Miscellaneous - - -	5	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Total from all causes -	41	13	2	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Grand total of all classes from all causes	96	116	6	3	1	—	2	7	1	—	2	1	15	8	12	11	1	2	—	—	—	—	—	—	—	—	—	—	—	
Mean length of railway open during the year (miles) - - -	1,354		113		28		42		27		216		271		689		168		19		873		308		109		4,170			
Number of passengers carried - - -	5,073,377		1,294,976		248,837		347,788		81,301		653,165		711,652		2,166,158		826,285		102,187		3,042,250		1,851,282		98,829		16,513,037			
Train mileage (goods and passengers) -	6,504,856		365,336		81,916		65,942		22,884		295,120		453,333		1,868,590		312,901		30,300		2,836,760		794,960		120,483		13,703,381			

TABLE No. III.

Shewing 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 1869.

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 own Control.		Within own Control.		Killed.	Injured.	Killed.	Injured.	Killed and Injured.	
									Killed.	Injured.	Killed.	Injured.						
Bengal - - -	1869*	2,065	7,739,387	3,860	152	8,426,046	4,202	16	35	6	30	54	57	48	13	124	135	259
	1868†	1,828	5,781,253	3,162	79	7,931,288	4,338	19	52	5	32	59	85	32	11	115	180	295
Madras - - -	1869	876	2,211,791	2,525	92	3,094,630	3,533	—	1	—	—	10	10	3	2	13	13	26
	1868	843	1,748,334	2,074	16	3,002,195	3,561	3	8	—	1	9	10	7	1	19	20	39
Bombay - - -	1869	1,289	3,752,203	2,911	828	4,992,361	3,873	32	56	2	4	37	45	8	5	79	110	189
	1868	1,287	3,901,569	3,031	164	5,295,376	4,115	3	4	5	17	32	44	18	9	58	74	132
India - - -	1869*	4,170	13,703,381	3,286	572	16,513,037	3,960	48	92	8	34	101	112	59	20	216	258	494
	1868†	3,958	11,431,656	2,889	259	16,228,859	4,100	25	64	10	50	100	139	57	21	192	274	466

\* Contains figures for the Nulbattee line.

† Exclusive of figures for ditto.

## CAPITAL.

Capital.

27. On the 1st April 1869 there was a balance of 3,202,119*l.* standing to the credit of the Indian Railway Companies. During the year ending 31st March last, they have raised a further sum of 4,269,252*l.*, making 7,471,371*l.* in all, and have expended 4,393,027*l.*

28. The total amounts of capital which, up to the 31st March, had been raised by the Companies was 86,522,491*l.*, of which they had expended 83,444,147*l.* Of this, nearly two-thirds, or about 50,000,000*l.* has been used in India, and, with the exception of the Oude and Rohilkund Railway, has been advanced by the Government there in rupees at the rate of 1*s.* 10*d.*, the money having been paid into the Home Treasury in sterling. The current rate of exchange during the greater part of the period while these transactions have been going on has generally been 2*s.* the rupee. So that the Government has thus added 2*d.* in the rupee or 9 per cent. to the money provided by the Companies for construction purposes. A sum of about 4,000,000*l.* should accordingly be added to the 83,444,147*l.* expended by the Companies to exhibit the actual cost of the railways. The land also, which has in all cases been granted by the Government, must be taken into account and the cost of establishments. No complete statement has yet been received from India of the amount expended by the Government on these heads, but the value of the land cannot I think be taken at less than 2,500,000*l.*, and the cost of establishments\* at less than 500,000*l.* The total amount expended on Railways in the hands of the Companies will thus reach, in round numbers, 90,000,000*l.* The mileage cost of the 4,600 miles of open line cannot, however, be deduced from this sum without first deducting the amount which has been laid out on the lines not yet open, and it is difficult to form an opinion on this point at the present moment.

Cost of State railways.

29. No statements have been received of the actual expenditure on, or the estimated cost of, the lines in the hands of Government. The capital of the Calcutta and South-eastern line, surrendered to the Government by the company which constructed it, may be taken at about 650,000*l.*, and the cost of the Khamgaon line, which has been paid for out of the Berar revenues, at 40,000*l.* A sum of 100,000*l.* has also probably been expended on the Punjab Northern Railway, the cost of which it is estimated will come to about 10,000*l.* a mile, or 3,000,000*l.*

Classification of capital.

30. It will be seen that of the 86,522,491*l.* raised, 71,590,846*l.* consists of share capital, 13,605,685*l.* of debentures, and 1,325,960*l.* of debenture stock. The amount representing debentures has been reduced during the year by 2,370,830*l.*; viz., from 15,976,515*l.* to 13,605,685*l.*

Estimated expenditure during 1870-71.

31. With respect to the expenditure on the railways during the ensuing official year ending the 31st March 1871, it is estimated that a sum of 2,871,800*l.* will be required in India, and 2,150,000*l.* in England for the guaranteed lines, and that on the State lines 955,300*l.* will be expended in India, and 274,500*l.* in this country, making in all 5,021,800*l.* for guaranteed, and 1,229,800*l.* for State lines. Besides this, it is estimated that the State charges connected with the establishments and purchase of land will amount to 145,360*l.* Thus about 4,000,000*l.* will probably be expended in India, and 2,400,000*l.* in England during the ensuing year on Indian railways. A balance of about 3,000,000*l.* stood to the credit of the companies at the beginning of the year to be applied towards this expenditure.

## STATE LINES.

	£
Calcutta and Canning	- 10,500
Surveys, North of Ganges	- 5,000
Rajpootana	- 314,300
Punjab	- 595,000
Indus Valley	- 142,500
Rolling Stock	- 147,500
Hooblee and Carwar	- 15,000
Total	- 1,229,800

\* Since 1864, the cost of establishments has amounted to 271,240*l.*

STATEMENT No. 1.

Shewing 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 1870.

Railway.	Estimated Cost of Lines.	Amount authorised to be raised to 31st March 1870.					Amount raised in England to 31st March 1870.				Amount raised in India to Date of last Advances.	Total Amount raised to 31st March 1870.	Total Amount expended to 31st March 1870 (partly estimated).	
		Share Capital.	Debentures.		Debenture Stock.	Total.	Share Capital.	Debentures.		Debenture Stock.				
			Convertible into Shares.	Inconvertible.				Convertible.	Inconvertible.					
	£	£	£	£	£	£	£	£	£	£	£	£	£	
East Indian {	Main line -	27,500,000	21,683,530	1,316,470	4,450,000	—	27,450,000	21,222,577	1,316,470	4,450,000	—	320,501	27,309,548	27,401,230
	Jubbulpore line	3,500,000	2,593,630	606,320	—	—	3,200,000	2,583,000	606,320	—	—	7,665	3,196,985	2,596,112
Great Indian Peninsula -		26,000,000	17,000,000	—	3,211,350	1,388,650	21,600,000	16,355,359	—	3,211,350	1,325,960	394,905	21,287,574	20,945,620
Madras - {	South-west line	6,500,000	4,816,550	1,122,450	311,000	—	6,250,000	4,621,690	1,122,450	311,000	—	—	6,055,140	} 9,475,904
	North-west line	4,500,000	3,750,000	—	—	—	3,750,000	3,711,945	—	—	—	—	3,711,945	
Bombay, Baroda, and Central India -		8,500,000	6,987,500	1,012,500	100,000	—	8,100,000	6,678,722	1,012,495	100,000	—	21,672	7,812,889	7,368,579
Scinde -		2,250,000	2,030,600	69,400	150,000	—	2,250,000	2,000,065	69,400	124,600	—	21,775	2,215,840	2,116,970
Indus Flotilla -		700,000	542,600	81,400	—	—	624,000	332,605	25,400	—	—	—	358,005	707,268
Punjab -		3,000,000	2,150,000	100,000	300,000	200,000	2,750,000	1,990,787	—	300,000	—	9,659	2,300,446	2,643,366
Delhi -		6,000,000	5,000,000	—	—	—	5,000,000	4,952,823	—	—	—	16,237	4,969,110	4,547,680
Great Southern of India -		3,000,000	2,299,400	150,600	100,000	400,000	2,950,000	2,122,179	150,600	100,000	—	1,221	2,374,000	1,464,533
Eastern Bengal -		3,000,000	2,238,000	—	610,700	—	2,848,700	2,164,321	—	592,600	—	15,924	2,772,845	2,752,143
Onde and Rohilkund -		5,000,000	3,819,000	181,000	—	—	4,000,000	1,782,397	113,000	—	—	18,967	1,914,364	1,363,298
Carnatic -		800,000	800,000	—	—	—	800,000	243,800	—	—	—	—	243,800	61,444
<b>Total -</b>		<b>100,250,000</b>	<b>75,710,860</b>	<b>4,640,140</b>	<b>9,233,050</b>	<b>1,988,650</b>	<b>91,572,700</b>	<b>70,762,270</b>	<b>4,416,135</b>	<b>9,189,550</b>	<b>1,325,960</b>	<b>828,576</b>	<b>86,522,491</b>	<b>83,444,147</b>

Accountant General's Department,  
9th April 1870.

W. G. GOODLIFFE,  
Accountant General.



STATEMENT No. 2.

Shewing the Amount raised and expended by each Company during the Year ended 31st March 1870.

Railway.	Sums standing to the Credit of the Companies on the 31st March 1869.	Sums advanced to the Companies on the 31st March 1869.	Amount raised between 1st April 1869 and 31st March 1870.		Amount expended.				Total raised during the Year ended 31st March 1870.	Total Amount expended during the Year ended 31st March 1870 (partly estimated).
			Share Capital.	Debenture Stock.	In England, between 1st April 1869 and 31st March 1870.	In India.				
						Date to which Accounts have been received.	Amount.	Estimated Expenditure between dates specified and 31st March 1870.		
	£	£	£	£	£		£	£	£	£
East Indian { Main line - - - - -	—	* 297,617	997,366	—	298,485	31st Jan. 1870	412,946	80,000	997,366	791,431
East Indian { Jubbulpore line - - - - -	* 611,023	—	53,175	—	—	"	43,325	20,000	53,175	63,325
Great Indian Peninsula - - - - -	1,300,089	—	373,483	10,360	715,271	"	556,707	70,000	383,843	1,341,978
Madras - - - - -	669,359	—	36,966	—	216,142	"	139,002	60,000	26,966	415,144
Bombay, Baroda, and Central India	162,323	—	844,530	—	42,443	31st Jan. 1870	10,100	10,000	344,530	62,543
Scinde - - - - -	200,574	—	4,622	—	6,023	"	98,303	2,000	4,622	106,326
Indus Flotilla - - - - -	—	344,775	100	—	2,424	"	164	2,000	100	4,588
Punjab - - - - -	—	328,517	6,893	—	54,500	31st Dec. 1869	† 39,204	6,000	6,893	21,296
Delhi - - - - -	817,493	—	135,045	—	119,141	"	291,967	120,000	135,045	531,108
Great Southern of India - - - - -	—	65,371	1,024,000	—	12,889	"	31,273	5,000	1,024,000	49,162
Eastern Bengal - - - - -	—	18,172	192,319	—	16,705	"	116,740	20,000	192,319	153,445
Oude and Rohilkund - - - - -	495,710	—	906,593	—	670,647	31st Dec. 1869	130,590	50,000	906,593	851,237
Carnatic - - - - -	—	—	183,800	—	1,444	—	—	—	183,800	1,444
<b>Total - - - - -</b>	<b>4,256,571</b>	<b>1,054,452</b>	<b>4,258,892</b>	<b>10,360</b>	<b>2,156,114</b>	<b>—</b>	<b>1,791,913</b>	<b>445,000</b>	<b>4,269,252</b>	<b>4,393,027</b>

\* These Balances are understood to be subject to adjustment in respect of Rolling Stock supplied by the Main line for the Jubbulpore line to the value, as approximately estimated, of £250,000.

† The sale proceeds of Stores, and transfers to "Revenue Account," exceed by this sum the amount expended in India between 1st April and 31st December 1869 on Capital Account.

Accountant General's Department,  
9th April 1870.

W. G. GOODLIFFE,  
Accountant General.

## STATE OF DEBENTURE LOANS on the 31st March 1870.

Railway.	Amount.			Rate of Interest.	Date at which Loan expires.	Whether renewable.
	Convertible.	Inconvertible.	Total.			
East Indian	—	1,500,000		5	10th August 1870.	Renewable.
"	—	1,500,000		5	15th Dec. 1870.	
"	610,520	—		5	1st April 1871.	
"	655,950	—		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.	
"	606,320	—		5	23d March 1875.	
	1,922,790	4,450,000	6,372,790			
Great Indian Peninsula	—	36,900		5	30th June 1870.	Renewable.
"	—	67,550		5	31st Dec. 1870.	
"	—	313,700		4½	"	
"	—	382,350		5	30th June 1871.	
"	—	6,400		4½	"	
"	—	583,400		5	31st Dec. 1871.	
"	—	1,074,450		5	"	
"	—	435,000		5	30th June 1872.	
"	—	42,800		4½	"	
"	—	268,800		5	30th June 1873.	
	—	3,211,350	3,211,350			
Madras	42,000	—		5	1st July 1870.	Renewable.
"	110,350	311,000		5	1st January 1871.	
"	21,000	—		5	1st July 1871.	
"	458,500	—		5	1st January 1872.	
"	490,600	—		5	"	
	1,122,450	311,000	1,433,450			
Bombay, Baroda, and Central India	—	100,000		4½	15th January 1871.	Renewable.
"	473,200	—		5	1st July 1871	
"	212,395	—		5	1st July 1872.	
"	326,900	—		5	1st January 1873.	
	1,012,495	100,000	1,112,495			
Scinde	69,400	—		5	1st May 1870.	
"	—	124,600		4½	1st September 1870.	
	69,400	124,600	194,000			
Indus Steam Flotilla	25,400	—	25,400	5	1st May 1871.	
Punjab	—	300,000	300,000	4½	1st July 1870.	
Great Southern of India	42,100	—		5	1st July 1870.	
"	—	25,000		4½	1st January 1871.	
"	—	75,000		4½	1st July 1871.	
"	10,400	—		5	"	
"	500	—		5	1st January 1872.	
"	30,300	—		5	1st July 1872.	
"	10,000	—		5	1st January 1874.	
"	57,800	—		5	1st July 1874.	
	150,600	100,000	250,600			
Eastern Bengal	—	15,250		5	12th April 1871.	
"	—	333,450		5	12th October 1871.	
"	—	62,000		5	1st November 1871	
"	—	131,900		5	1st November 1874.	
	—	592,600	592,600			
Oude and Rohilkund	36,700	—		5	15th April 1870.	Renewable.
"	200	—		5	28th July 1871	
"	100	—		5	9th March 1872	
"	300	—		5	24th March 1872	
"	75,700	—		5	15th April 1875.	
	113,000	—	113,000			
			13,605,685			

Accountant General's Department,  
3rd May 1870.W. G. GOODLIFFE,  
Accountant General.

32. The following statements shew how the aforesaid expenditure has been incurred :—

Railway.	Works and Bridges.	Permanent Way and Stations.	Freight and Insurance.	Rolling Stock and Engines.	Establishments.	Miscellaneous, Electric Telegraph, Stores, &c.
	£	£	£	£	£	£
East Indian - - - -	9,365,000	6,990,000	2,955,000	3,370,000	3,675,000	3,643,000
Great Indian Peninsula - -	8,442,586	6,229,473	2,068,253	2,407,919	1,423,268	198,225
Madras - - - -	2,843,500	3,273,750	Store and Workshops. 948,016	883,111	769,405	389,244
Bombay, Baroda, and Central India -	2,990,000	1,815,000	Included in other items. 207,202	1,073,000	694,000	741,000
Scinde - - - -	595,250	371,879	207,202	226,030	268,298	314,614
Punjab - - - -	220,332	805,651	447,811	454,147	417,724	210,646
Delhi - - - -	1,090,232	2,114,303	62,318	478,787	216,459	507,448
Indus Flotilla - - - -	Steamers, &c., 593,843	Warehouses and Workshops. 45,504	35,169	—	63,206	85,148
Great Southern of India - - - -	—	972,310	—	114,581	165,689	52,322
Eastern Bengal - - - -	1,900,729	—	Included in other items.	284,161	275,848	201,853
Oude and Rohilkund - - - -	—	—	—	—	—	—
Carnatic - - - -	4,457	37,303	5,992	14,720	23,011	9,946

33. 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 -	22½	252,484	418,165	670,649
„ 1854 -	50½	960,878	768,710	1,729,588
„ 1855 -	98½	1,939,101	1,431,904	3,371,005
„ 1856 -	101½	1,752,813	1,765,094	3,517,907
„ 1857 -	143	1,324,873	2,092,395	3,417,268
„ 1858 -	145	1,940,052	3,551,073	5,491,125
„ 1859 -	74½	2,507,949	4,654,923	7,162,872
„ 1860 -	208	2,396,924	5,192,846	7,589,770
„ 1861 -	759	1,596,010	4,962,604	6,558,614
„ 1862 -	747	1,854,289	3,956,563	5,810,852
„ 1863 -	233½	1,411,661	3,360,114	4,771,775
„ 1864 -	402½	1,387,699	2,418,845	3,806,044
„ 1865 -	388½	2,192,090	3,192,323	5,384,413
„ 1866 -	205	3,942,598	3,816,967	7,759,555
„ 1867 -	349	4,045,584	2,979,376	7,024,960
„ 1868 -	174½	1,935,012	2,613,626	4,548,638
„ 1869 -	261	2,156,114	2,236,913	4,393,027

## REVENUE.

34. The net revenue of the railways for the year ending the 31st December last was 2,520,952*l.*, being 1,670*l.* less than that of the year 1868. There was an increase in the amount of gross receipts, which were 5,709,382*l.* in 1869, compared with 5,320,723*l.* in 1868, but the working expenses were 3,203,171*l.* compared with 2,808,038*l.* Revenue, 1869.

35. The guaranteed interest paid by the Government to the Railway Companies last year amounted to 4,013,871*l.*; in 1868 it was 3,704,388*l.*; so that last year the charge upon the State, after deducting the amount paid into the Government Treasury from the railway profits; including the 80,000*l.* surplus profits of the East Indian Railway, was 1,412,919*l.*, compared with 1,181,766*l.* in the previous year. Guaranteed interest.

36. The receipts from passengers in 1869 were 1,737,168*l.* as compared with 1,752,169*l.* in 1868, being a falling-off of 15,001*l.* The receipts from merchandise were 3,808,767*l.* in 1869 and 3,456,879*l.* in 1868, being an increase of 351,888*l.* Miscellaneous receipts also increased by 51,772*l.*, from 111,675*l.* to 163,447*l.* This net increase of 388,659*l.* in the receipts of 1869 over those of 1868 was, however, absorbed and converted into the small reduction above mentioned by an increase of 69,599*l.* in the maintenance charges, and of 325,534*l.* in the working expenses. Receipts.

37. These results cannot be regarded as satisfactory. There was a falling-off in the net receipts on all the lines, with the exception of the East Indian, on which there was an increase of 217,224*l.*, and the Delhi, where the increase, due to the additional mileage, was 41,864*l.* The depressed state of trade and famines in certain districts have seriously checked traffic, and the expense of repairing flood damages in the previous year have in some cases (especially on the Bombay, Baroda, and Central India, where the gross receipts had increased), raised the working and maintenance charges to an excessive height. Results.

38. It will be observed that the proportion of working expenses to gross receipts in some cases was above 80 per cent., while in others, viz., the East Indian and the North-west line of the Madras, it was about half that proportion. The average expenses of the 13 lines which realised profits were, in 1868, 61.77, and in 1869, 64.05 per cent. of the gross receipts. It may be expected that, when the lines have more fully developed the traffic which they ought to command, and when by the use of cheaper fuel from native sources the present heavy charges in the locomotive department are reduced, the average rate of expenditure will be under 50 per cent. If this had been the case during the past year of depression, nearly 350,000*l.* would have been added to the net receipts. Strenuous efforts are being made both by the Government and the Companies to reduce expenditure in every way, and to bring the working and establishment charges as low as is compatible with efficiency. High rate of working expenses. Efforts to reduce expenditure.

REVENUE ACCOUNTS for Years ended 31st Decmber 1868 and 1869.

Railway.	Receipts.								Expenditure.						Per-centage of Working Expenses to Gross Receipts.		Net Receipts.	
	Passengers.		Goods.		Miscellaneous.		Total.		Maintenance.		Working.		Total.		1868.	1869.	1868.	1869.
	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.				
East Indian : Main line -	£ 686,504	£ 678,532	£ 1,435,784	£ 1,748,474	£ 27,384	£ 54,907	£ 2,149,672	£ 2,481,913	£ 206,901	£ 178,561	£ 725,150	£ 857,031	£ 932,351	£ 1,035,592	43·37	41·72	£ 1,217,621	£ 1,446,321
„ Jubbulpore line -	41,824	42,561	42,376	51,861	1,105	14,177	86,306	108,599	12,236	23,104	52,744	94,344	64,980	117,448	—	—	Dr. 20,325	Dr. 5,849
Great Indian Peninsula -	379,440	363,744	1,083,682	1,055,541	16,917	29,158	1,480,039	1,446,443	237,572	291,307	677,189	676,120	914,761	967,427	61·80	66·78	565,278	481,016
Madras : South-west line -	160,701	153,419	242,684	244,232	16,981	22,312	420,366	419,963	66,738	92,700	117,952	125,943	184,690	218,643	43·93	52·06	235,676	201,320
„ North-west line -	82,372	36,311	112,457	103,645	947	2,711	145,776	142,657	9,998	9,986	40,236	47,969	50,234	57,975	34·46	40·63	95,542	64,692
Bombay, Baroda, and Central India -	187,561	187,097	196,953	228,348	35,200	26,386	419,714	441,831	76,265	66,428	196,230	268,779	272,495	335,207	64·94	75·84	147,219	106,624
Scinde -	19,278	13,911	76,513	57,949	1,691	1,703	97,482	73,563	15,416	17,159	51,302	44,186	66,718	61,345	68·64	83·39	30,764	12,218
Punjab -	40,796	37,192	59,728	57,420	2,310	2,256	102,834	96,868	18,249	20,741	60,141	78,646	78,390	99,387	76·23	—	24,444	Dr. 2,519
Delhi -	12,237	70,426	3,782	57,061	80	1,574	16,099	129,061	686	3,616	22,316	76,678	23,002	80,294	—	62·21	Dr. 6,903	43,767
Indus Steam Flotilla -	40,208	11,139	79,870	75,243	653	1,663	120,731	88,045	—	—	71,780	67,673	71,780	67,675	59·46	76·86	48,951	20,370
Great Southern of India -	44,843	42,633	27,717	26,432	820	1,022	73,380	70,086	5,302	13,634	28,299	30,809	33,601	44,443	45·76	63·41	39,779	25,643
Eastern Bengal -	73,676	70,304	85,888	91,671	6,873	4,363	166,437	166,338	18,224	18,467	57,070	62,132	75,294	80,509	45·23	48·45	91,143	85,739
Oude and Rohilkund : Main line -	17,286	15,572	7,387	5,337	187	332	24,860	21,291	1,976	2,808	18,541	14,595	20,517	17,403	82·53	81·22	4,343	3,888
„ Nulhatee line	7,879	5,906	144	2,429	112	125	8,135	8,460	1,709	1,214	5,102	3,831	6,802	5,045	83·61	59·63	1,333	3,415
Carnatic -	3,653	3,972	460	856	275	21	4,328	4,849	947	1,069	3,337	2,851	4,184	3,910	93·07	80·63	204	939
Calcutta and South-eastern (State)	* 3,911	4,450	* 1,454	2,218	0	737	* 3,505	7,405	* 2,078	3,103	* 6,461	7,675	* 8,539	10,778	—	—	Dr. * 5,094	Dr. 3,373
Total -	1,752,169	1,737,168	3,456,879	3,808,767	111,675	163,447	5,320,723	5,709,382	674,288	748,887	2,133,750	2,459,284	2,808,038	3,203,171	—	—	2,522,623	2,520,952

\* The figures for 1868 apply only from the 1st April to 31st December 1868.

### GUARANTEED INTEREST.

39. It will be seen by the subjoined statements that up to the 31st December 1869, a sum of 29,778,758*l.* 17*s.* 9*d.* had been paid by the Indian Government during the last 20 years for guaranteed interest. Of this sum 13,914,413*l.* 7*s.* 6*d.* had been recovered from the Companies; that is to say, their net half-yearly receipts (less the half surplus profits, which in three or four instances have been divided among the shareholders,) had, in the aggregate, amounted to that sum on the 30th June 1869, and had been paid to the Government. Guaranteed interest.

#### GUARANTEED INTEREST.—INDIAN RAILWAYS.

Statement of the Total Amount of Interest advanced to each of the under-mentioned Railway Companies to 31st December 1869.

Company.	Interest paid up to 31st December 1869.			Interest paid during 1869.						Total.					
				England.		India.		Total.							
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.			
East Indian - - -	11,307,097	14	2	1,443,664	10	3	16,838	19	9	1,460,503	10	0	12,767,601	4	2
Great Indian Peninsula	5,798,297	1	7	962,601	16	0	19,714	9	3	982,316	5	3	6,780,613	6	10
Madras - - -	3,427,146	4	8	482,030	4	5	—			482,030	4	5	3,909,176	9	1
Bombay, Baroda, and Central India - -	2,009,883	17	9	371,505	12	5	1,083	4	4	372,588	16	9	2,382,472	14	6
Scinde - - -	832,885	19	5	108,337	14	11	1,088	1	4	109,425	16	3	942,311	15	8
Punjab - - -	717,202	5	5	108,423	5	9	482	19	0	108,906	4	9	826,108	10	2
Delhi - - -	431,231	17	3	234,271	10	3	738	17	5	235,010	7	8	666,242	4	11
Indus Steam Flotilla -	165,373	14	4	17,895	5	0	—			17,895	5	0	183,268	19	4
Great Southern of India	328,576	19	0	66,125	0	0	—			66,125	0	0	394,701	19	0
Eastern Bengal - -	658,152	3	5	127,270	9	8	732	17	8	128,003	7	4	786,155	10	9
Oude and Rohilkund -	89,038	12	0	50,303	9	3	763	2	1	51,066	11	4	140,105	3	4
Total -	£ 25,764,886	9	0	3,972,428	17	11	41,442	10	10	4,013,871	8	9	29,778,757	17	9

Accountant General's Department,  
9th April 1870.

W. G. GOODLIFFE,  
Accountant General.

40. The actual amounts due from each Company at the end of last year for guaranteed interest is given, approximately, in the following statement. It must be borne in mind, however, that in addition to the sums here given, simple interest at the rate of 5 per cent. per annum is, under the contracts, chargeable upon the advances on this account. This interest is calculated to have reached about 4,900,000*l.*, raising the whole charge upon the future receipts of the railways up to half their surplus profits, *i.e.* the profits over and above the rate of interest guaranteed to about 20,765,000*l.*

41. The East Indian Railway debt would, for instance, thus be increased from 5,568,960*l.* to (say) 7,600,000*l.*; the Great Indian Peninsula from 3,559,248*l.* to 4,600,000*l.*; the Madras from 1,366,000*l.* to 3,000,000*l.*; the Eastern Bengal from 369,000*l.* to 470,000*l.* Some of the Companies, *viz.*, the Great Indian Peninsula, the Madras, the Bombay, Baroda, and Central India, the Scinde, Punjab, and Delhi, and the Great Southern, have agreed to the arrangements mentioned in the former part of this report, and will hereafter always divide the surplus profits with the Government, no account being kept against them for the guaranteed interest advanced.

A STATEMENT of the APPROXIMATE AMOUNTS advanced on account of GUARANTEED INTEREST to the several under-mentioned Railway Companies to 30th June 1869, beyond the amount of Net Revenue applied thereto.

Railway Company.	Total amount advanced to 31st December 1869.*	Aggregate of Net Revenue Balances for the several half-years to 30th June 1869, inclusive.	Net amount advanced.
	£ s. d.	£ s. d.	£ s. d.
East Indian, Main line - -	11,462,499 19 6	7,176,073 13 0	4,286,426 6 6
"    Jubbulpore line - -	1,805,101 4 8	22,567 16 10	1,282,533 7 10
Great Indian Peninsula - -	6,780,613 6 10	3,221,365 7 3	3,559,247 19 7
Madras, South-west line - -	2,802,455 13 4	1,436,388 12 3	1,366,067 1 1
"    North-west line - -	1,106,720 15 9	276,072 7 1	830,648 8 8
Bombay, Baroda, and Central India - -	2,382,472 14 6	869,203 6 10	1,513,269 7 8
Scinde, Scinde Railway - -	942,311 15 8	92,574 13 5	849,737 2 3
"    Indus Flotilla - -	183,268 19 4	—	183,268 19 4
"    Punjab Railway - -	826,108 10 2	140,211 18 3	685,896 11 11
"    Delhi Railway - -	666,242 4 11	69,022 9 10	597,219 15 1
Great Southern of India - -	394,701 19 0	184,100 12 11	210,601 6 1
Eastern Bengal - -	786,155 10 9	417,102 12 7	369,052 18 2
Oude and Rohilkund - -	140,105 3 4	9,729 17 3	180,375 6 1
	£ 29,778,757 17 9	13,914,413 7 6	15,864,344 10 3

\* The Interest for the half-year to 30th June 1869 not being paid until the succeeding half-year.

Accountant General's Department,  
3rd May 1870.

W. G. GOODLIFFE,  
Accountant General.

42. It would thus appear that a sum of 15,864,344*l.* has, during the last 20 years, while the railways have been in course of execution, been drawn from the revenues of India for the payment of the guaranteed interest. This gives an average of about 793,000*l.* a year. In some years it has amounted to more than twice that sum. In others it has been much less. The largest sum was 1,700,474*l.*, in 1868-69; the smallest 67,043*l.*, in 1865-66.

43. While the State has been making this annual contribution towards the railways, it must be borne in mind that it has for some years derived a direct pecuniary benefit from them, both by the conveyance of mails free of charge, and the conveyance of troops, both horse and foot at the lowest fares, and their baggage, ammunition, camp equipage and equipments, at the lowest rates chargeable for goods of that kind. The saving thus effected must be considerable, and nearly, if not quite equivalent to the amount of the annual average charge hitherto incurred by the revenues of the country for the guarantee. This charge, it may be hoped will gradually diminish, as the lines are completed, and the deficit ultimately converted into a surplus.

44. The following statement, which is taken from returns rendered to Parliament by the financial department, gives the amount of guaranteed interest paid by Government on railway capital, in each official year from 1856-57, less the net traffic receipts from the railways.

Year.	Net Amount of guaranteed Interest paid by the Government.	Year.	Net Amount of guaranteed Interest paid by the Government.
	£		£
1856-57 -	404,197	1863-64 -	1,669,283
1857-58 -	526,420	1864-65 -	1,591,797
1858-59 -	606,046	1865-66 -	67,043
1859-60 -	810,468	1866-67 -	731,049 (11 months)
1860-61 -	1,121,734	1867-68 -	1,540,435
1861-62 -	1,425,080	1868-69 -	1,700,470
1862-63 -	1,572,174	1869-70 -	1,524,821

#### TRAFFIC AND WORKING.

Traffic returns.

45. I have been enabled this year, by the prompt attention of the companies' agents in India to a request for the early delivery of traffic returns for the second half of last year, to bring these accounts up to the end of 1869, and the returns

in future will be given for the year ending 31st December, instead of as heretofore the 30th June. To enable a comparison, however, to be made with last year's results, the returns for the year ending June last are also given in this report. The following observations apply to the years ending in June, not in December, as is the case under the head of "Revenue."

46. It will be seen that the gross receipts from all sources for that period have increased on every line, except the Scinde section of the Scinde, Punjab, and Delli system, making an addition of 188,596*l.* in the aggregate in passengers and 577,108*l.* in goods, the former being 1,552,560*l.* in 1867-8 and 1,740,956*l.* in 1868-9, and the latter 3,128,256*l.* and 3,705,364*l.* respectively. The train mileage also increased from 11,980,319 in 1867-8 to 12,318,086 in 1868-9. The number of miles open were 3,688 and 4,065 respectively in the two periods.

47. The working charges also increased by 236,728*l.*, from 2,662,579*l.* in 1867-8 to 2,899,307*l.* in 1868-9. Thus an increase of 528,976*l.* in the net receipts was produced. The receipts per mile in 1867-8 were 547*l.*; in 1868-9, 634*l.*

48. The train mileage receipts and expenses exhibit upon the whole a slight improvement. The average gross receipts per train mile from the ten open lines in 1867-68 and 1868-69 were 8·5*s.* and 9·5*s.* respectively; the average expenses being 5·4*s.* and 5·5*s.* The heavy mileage charges for maintenance on the Great Indian Peninsula, the Bombay, Baroda, and Central India, and the Scinde are due to extraordinary repairs, and the great difference in the expenses of the locomotive department on the Bombay, Baroda, and Central India (30·9*d.*), the Scinde (42·16*d.*), the Great Indian Peninsula (28·4*d.*), the East Indian (15·75*d.*), the Madras (14*d.*), the Great Southern of India (12·8*d.*), and the Eastern Bengal (15*d.*), may be accounted for by the high price of fuel in Western India, the use of native coal in Bengal, and the more extensive employment of wood in Madras.

49. The first and second class still form a very small portion of the passenger traffic. Out of 16,011,633 conveyed, 137,762 were first, 626,355 second, and 15,247,516 third class, the last being 95·23 per cent. of the whole. The receipts from passengers amounted to 1,496,117*l.*, of which 1,263,481*l.*, or 84·45 per cent., was obtained from the third class, the second class producing 133,773*l.*, and the first 92,000*l.*

50. The goods which constitute the principal part of the merchandise traffic, are coal, cotton, iron, sugar, indigo, grains, rice, salt, piece-goods, jute, hides. During the year ending the 30th June, 2,588,513 tons of merchandise were carried, the receipts therefrom amounting to 3,705,364*l.*, of this 1,017,216 tons were conveyed by the East Indian, and 514,377 by the Great Indian Peninsula Railways alone, the receipts of these two Companies being 2,840,675*l.*, or 76 per cent. of the whole. The information at present procurable does not enable me to give the amount of each principal commodity conveyed, but I find that by far the greater proportion consists of grain and rice; then come salt, cotton, coal, sugar, piece-goods, hides, saltpetre, jute.

51. Upon the eve of the junction of the East Indian and Great Indian Peninsula Railways at Jubbulpore, the boards of the two Companies met to consider the traffic arrangements to be made, and at once decided upon laying down the principle of a free and unrestricted interchange of traffic between the two railways, leaving it to the agents and managers in India to carry that principle into practice in a manner that would be alike advantageous to the public and the companies. Spacious saloon carriages will be provided for the long journey, with all such comforts and conveniences for refreshment and repose as will reduce fatigue and weariness to a minimum.

52. With a view to economy in working, endeavours have been made, and are still being made, to increase the carrying capacity of the wagons and carriages in proportion to their dead weight and the load usually carried. In England and in America, a wagon, it is calculated, carries on an average a load 1·50 times its own weight. Where the goods are light, as some of the staple commodities of India are, there is more difficulty in fixing a favorable proportion, for the greater capacity of the goods in proportion to their weight, the higher the sides of, and therefore the heavier must be the vehicle; cotton, for instance, would probably require three times the space for the same weight of salt, and four or five times that of bricks, or iron. A variety of trucks is consequently desirable, and careful traffic management necessary, to secure strict economy. Amongst other devices an iron cylindrical wagon, designed by Mr. Prestage of the Eastern Bengal



Railway, and an iron wagon, not cylindrical, designed by Mr. Rendel, have been provided.

Uniformity in working different lines.

53. Now that the various lines are being formed into a united whole, it is very desirable to consider not only the mode by which a continuous traffic shall be conducted, but how uniformity in the arrangements of working the system may be established. The circumstances of each railway may, and do differ, but there is much that is common to all, and as far as is practicable, uniformity should be maintained both as regards the system of management and rates of charge as well as the rules for regulating the pay, leave, promotion, &c. of the various grades of the railway service generally. One branch of this question has already been referred to under the head of European staff. The existence in different parts of the country of so many agencies, all engaged in the same kind of work, and the ready means of communication which the railways afford, naturally suggest the expediency of periodical conferences between the representatives of the various departments of each railway, to exchange thoughts and ideas, and to give one another the advantage of their personal knowledge and experience.

Fares.

Reduction desirable.

54. No material change has been made in the rates and fares during the past year, but such alterations as have been made are in the right direction. The Bombay, Baroda, and Central India Railway Company reduced the rates for cotton on their line between certain places. The fares for third class passengers on the same line were also reduced to 3 pies, or  $\frac{3}{4}d.$  per mile. The effect of lowering the charge for the conveyance of grain on the East Indian Railway to  $\frac{1}{2}d.$  a ton a mile during the scarcity which prevailed was to produce a large increase in the traffic and a fair profit, results which should encourage the policy of adopting low rates for the carriage of the staple commodities of the country. It takes some little time for the managers of traffic, in a country where railways are new, to ascertain the habits and prejudices of the producers and traders, and it requires considerable skill and judgment to suit a new mode of conveyance or a fresh channel for trade to the tastes and wishes of the people. In many places the road and the river are still used in preference to the railway. The value of time has not yet been learnt. This knowledge will, in due course, be acquired; but it will, I think, be found good policy, in the meanwhile, to offer the temptation of lower rates for certain goods, especially on lines which have water communication to compete with them. Major Taylor, in his report on Belgian Railways before referred to, points out that in that country the principle of a sliding scale is adopted, the mileage charges being in an inverse ratio to the distance. A line is divided into certain equal sections, and goods and passengers conveyed any distance within each division is charged the same. Thus the sections may be each 20 miles in length. A person travelling two miles is charged the same as one going 20, and one going 22 the same as one travelling 40. The correctness of this principle appears, however, open to doubt. The stations on a line having been fixed, and the rolling stock provided, the cost of haulage and the distance carried would seem to form the more correct basis for the charge, exceptions being made in certain cases where the circumstances of the traffic between two stations are of a special nature.

Rates in force.

55. The following are the charges now in force. Salt, grain, &c. are carried at the lowest rates; rice at  $1\frac{1}{2}d.$  per ton; cotton, if pressed, at from  $1\frac{1}{2}d.$  to  $1\frac{3}{4}d.$ ; if unpressed, at  $4\frac{1}{2}d.$  per ton per mile.

Railway.	Passengers, per mile.				Goods, per ton per mile.						
	1st Class.	2nd Class.	3rd Class.	4th Class.	1.	2.	3.	4.	5.	6.	Special.
East Indian	$2\frac{1}{2}$	$1\frac{3}{4}$	$\frac{d.}{8}$	—	$d.$ 1	$d.$ $1\frac{1}{4}$	$d.$ $2\frac{1}{4}$	$d.$ $2\frac{3}{4}$	$d.$ $3\frac{1}{2}$	—	$d.$ $\frac{7}{8}$ for distances over 300 miles.
Great Indian Peninsula	$2\frac{1}{4}$	$1\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$	1	$1\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{1}{2}$	3	7	Many articles are carried on this line at special rates, below the ordinary.
Madras	$2\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	—	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{4}$	3	6	
Bombay, Baroda, and Central India.	$1\frac{7}{8}$	$\frac{7}{8}$	$\frac{1}{2}$	—	1	$1\frac{1}{4}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$3\frac{1}{2}$	5	
Scinde and Punjab	$2\frac{1}{4}$	$1\frac{1}{2}$	$\frac{5}{16}$	—	—	—	—	—	—	—	
Great Southern of India	$2\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	—	—	—	—	—	—	—	
Eastern Bengal	$2\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{2}$	—	1	$1\frac{3}{4}$	$2\frac{1}{4}$	$3\frac{1}{4}$	7	—	$\frac{3}{4}$
Oude and Rohilkund	$2\frac{1}{4}$	$1\frac{1}{2}$	$\frac{1}{4}$	—	$1\frac{1}{4}$	$1\frac{1}{4}$	$2\frac{1}{4}$	$3\frac{1}{2}$	7	—	$\frac{3}{4}$

SUMMARY of TRAFFIC on the INDIAN GUARANTEED RAILWAYS for the Year ended 30th June 1869.

Railway.	Number of Miles of Open Line.			Number of Miles of Sidings.	Passenger Traffic.							Goods Traffic.					Number of Trains run.				Number of Miles travelled by Trains, exclusive of Shunting, &c.				Number of Engines employed.	
	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 Pullies.	Number of Horses.	Number of Dogs, &c.	Live Stock.			Number of Tons of Minerals.	Number of Tons of Merchandise (exclusive of Live Stock and Minerals).	Passenger Trains.	Goods and Mineral Trains.	Mixed Trains.	Total Number of Trains.	By Passenger Trains.	By Goods and Mineral Trains.	By Mixed Trains.		Total Number of Miles.
					1st Class.	2nd Class.	3rd Class, &c.	Total Number of Passengers.					Number of Cattle.	Number of Sheep.	Number of Pigs, &c.											
East Indian (Main Line)	203	930	1,133	417	85,443	123,725	4,608,620	4,965,788	774	1,144	4,403	8,001	547	298	11	265,718	940,012	3,567	16,504	15,030	35,121	920,669	3,282,472	1,287,825	5,490,967	417
„ (Jubbulpore Line)	—	223	223	10	2,654	9,847	148,637	160,553	—	74	354	476	29	14	4	24	77,204	70	631	1,154	1,855	11,511	57,427	267,342	329,280	27
Great Indian Peninsula	256	616	872	*	82,960	187,563	3,020,408	3,247,171	1,123	639	6,613	6,162	398	283,337	22	406,128	514,377	9,919	22,578	4,185	36,682	876,180	1,674,565	378,482	2,929,227	178
Madras (South-west Line)	—	492	492	63	7,768	68,565	1,501,368	1,637,607	7	812	4,011	2,637	6,136			—	326,237	—	—	6,910	6,910	—	—	1,118,210	1,118,210	39
„ (North-west Line)	—	185	185	*	764	6,012	437,365	444,131	—	213	1,174	572	456			—	98,486	—	—	3,714	3,714	—	—	314,428	314,428	27
Bombay, Baroda, and Central India	17	291	308	*	11,861	82,592	1,646,488	1,740,954	433	462	2,552	2,114	4,027	156,250	626	15,323	162,548	1,593	9,314	2,769	13,976	236,162	336,316	128,535	701,013	*
Scinde	5	104	109	48	1,573	8,019	103,202	113,453	415	41	220	565	7	49	—	22,228	87,925	43	344	968	1,355	1,575	27,180	79,894	108,649	18
„ Punjab	—	246	246	26	6,767	39,051	669,542	699,360	—	90	722	1,263	64	120	—	—	63,223	—	1,435	2,870	4,365	—	137,897	269,673	347,540	30
„ Delhi	—	174	174	78	8,180	42,133	418,507	408,887	—	154	1,552	2,185	141	62	—	—	74,691	—	774	3,133	3,907	—	56,348	173,287	229,630	† 26
Great Southern of India	—	163	163	12	1,354	7,797	811,000	820,340	—	431	567	399	417	—	—	4,439	69,308	—	—	2,345	2,345	—	—	309,510	309,510	17
Eastern Bengal	—	113	113	24	26,020	33,806	1,256,460	1,295,292	224	140	805	920	62	96	—	39,635	133,902	2,912	1,653	626	6,191	169,376	115,437	52,584	307,598	?
Oude and Rohilkund (Main Line)	—	42	42	5	2,823	8,401	856,795	368,000	—	70	341	708	23	2	1	—	80,478	—	—	1,572	1,572	—	—	66,624	66,624	4
Totals	481	3,584	4,065		137,762	620,355	15,247,516	16,011,633	2,976	4,278	23,104	23,611	454,002			753,303	2,588,513	18,104	54,233	45,296	116,633	2,221,674	5,717,668	4,375,804	12,318,686	

\* Not stated.

† Beas section worked by the Punjab Railway engines.

SUMMARY of TRAFFIC on the INDIAN GUARANTEED RAILWAYS for the Year ended 30th June 1869—continued.

Railway.	Fares per Mile.			Gross Receipts from Passenger Traffic.											Gross Receipts from Goods Traffic.					Total Receipts from all Sources of Traffic.	Average Receipts per Train Mile.
	1st Class.	2nd Class.	3rd Class.	Receipts from Passengers.					Total Receipts from Excess Luggage, Parcels, Carriages, Horses, Dogs, &c., conveyed in Passenger Trains.	Receipts from Mails.	Receipts from Special Trains.	Receipts from Troop Trains.	Total Receipts from Passenger Traffic.	Receipts per Train Mile from Passengers.	Live Stock.	Minerals.	General Merchandise.	Total Receipts from Goods Traffic.	Receipts per Train Mile from Goods.		
				1st Class.	2nd Class.	3rd Class, &c.	Holders of Season or Periodical Tickets.	Total Receipts from Passengers.													
East Indian (Main Line) - - - - -	18	9	5	30,088	50,012	404,096	3,058	585,051	65,133	12,467	2,195	30,155	605,005	2'52	1,014	165,472	1,510,834	1,686,323	0'13	2,381,328	8'0
(Jubbulpore Line) - - - - -	18	9	5	2,976	5,678	23,314	—	31,968	3,525	5,378	—	4,413	45,188	2'74	20	24	52,207	62,351	3'17	97,439	5'9
Great Indian Peninsula - - - - -	18	9	4	25,350	35,046	306,858	1,635	329,624	45,165	2,362	4,010	—	381,170	2'60	9,098	50,066	1,042,937	1,102,101	7'52	1,183,271	10'1
Madras (South-west Line) - - - - -	18	6	3	11,591	12,079	114,430	81	138,181	18,200	—	705	—	157,146	2'31	551	—	239,507	240,188	4'04	397,264	6'8
(North-west Line) - - - - -	18	6	3	789	916	28,096	—	30,381	3,033	—	62	—	34,376	2'18	121	—	95,247	95,368	6'06	129,744	8'2
Bombay, Baroda, and Central India - - - - -	15	7	4	5,101	10,725	155,423	377	171,626	16,606	132	4,940	—	193,094	5'50	7,708	23,090	214,548	245,346	6'39	438,440	12'5
Scinde - - - - -	*	*	*	883	1,211	13,106	8	15,168	1,256	—	—	—	16,414	3'02	3	1,350	62,630	63,088	11'77	80,307	14'8
Punjab - - - - -	18	9	2½	2,318	5,621	20,823	—	37,766	3,631	101	—	—	40,938	2'35	92	—	64,010	65,002	3'73	105,940	6'1
Delhi - - - - -	18	9	2½	3,303	6,926	25,007	—	38,736	6,035	52	—	—	39,822	3'46	22	—	28,395	29,417	2'47	68,239	5'9
Great Southern of India - - - - -	18	5	3	700	925	39,793	—	41,368	2,340	—	105	—	43,873	2'34	81	1,261	26,104	27,306	1'77	71,269	4'6
Eastern Bengal - - - - -	18	9	4½	4,067	2,703	50,123	500	66,412	5,328	5,604	—	—	77,484	4'21	20	17,311	74,746	92,086	5'01	160,531	9'2
Oude and Rohilkund (Main Line) - - - - -	18	9	2	1,061	1,063	12,873	—	14,997	1,469	—	—	—	16,436	4'37	4	—	6,069	6,073	2'11	28,469	7'1
Totals - - - - -	—	—	—	92,090	138,778	1,203,491	6,259	1,400,117	172,290	26,136	11,786	34,568	1,740,050	—	16,693	258,374	3,428,094	3,705,344	—	5,440,323	—

\* Not stated.

STATEMENT showing the EXPENDITURE ON REVENUE ACCOUNT for the Year ended 30th June 1869.

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 Damage 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.
	£	d.	£	d.	£	d.	£	d.	£	d.	£	d.	£	d.	£	d.	£	d.	£	d.
East Indian (Main Line)	170,248	7'48	360,878	15'78	90,455	3'94	207,117	9'04	2,946	0'12	200	0'008	2,501	0'109	720	0'03	129,712	5'61	963,775	8'50
„ (Jubbulpore Line)	21,906	16'01	53,021	33'64	5,475	3'98	12,524	9'12	45	0'03	12	0'008	146	0'106	37	0'020	8,752	6'37	101,076	6'19
Great Indian Peninsula	270,702	22'17	347,188	28'44	79,419	6'50	175,975	14'41	—	—	9,062	0'31	1,183	0'09	5,208	0'42	62,810	5'14	952,421	6'50
Madras (South-west Line)	68,537	14'70	70,181	15'06	6,185	1'31	32,405	6'95	145	0'03	—	—	17	0'003	0	0'001	11,532	2'47	188,961	3'37
„ (North-west Line)	11,408	8'70	17,689	13'50	1,808	1'33	6,879	5'25	83	0'03	—	—	2	0'001	—	—	13,512	10'17	51,381	3'26
Bombay, Baroda, and Central India	65,400	22'33	92,646	31'71	24,463	5'32	57,939	19'83	950	0'32	5	0'001	4,933	1'68	586	0'30	58,243	19'04	305,226	8'70
Scinde	13,268	20'30	19,089	42'16	3,027	6'68	13,433	29'67	—	—	—	—	370	0'31	67	0'14	6,682	14'76	55,936	10'29
„ Punjab	20,808	14'36	31,312	31'55	2,378	1'64	17,831	12'31	70	0'04	7	0'004	610	0'42	80	0'06	21,483	14'81	94,498	5'43
„ Delhi	2,279	2'88	21,006	21'95	945	0'98	14,235	14'37	8	0'008	—	—	261	0'27	2	0'002	5,789	6'05	44,525	3'87
Great Southern of India	7,909	6'13	16,495	12'79	3,564	2'76	5,245	4'06	204	0'15	16	0'01	63	0'04	9	0'006	5,026	3'89	38,531	2'48
Eastern Bengal	19,553	12'76	22,074	14'09	3,664	2'39	25,172	16'43	207	0'13	—	—	299	0'19	—	—	8,901	5'61	86,779	4'30
Oude and Rohilkund (Main Line)	8,108	11'27	7,549	27'44	1,293	4'70	4,846	17'62	—	—	—	—	102	0'36	—	—	4,413	16'04	21,597	0'45
Totals	675,240	—	1,059,863	—	222,022	—	572,596	—	4,604	—	10,203	—	10,487	—	6,727	—	335,674	—	2,899,507	—

SUMMARY of TRAFFIC on the INDIAN RAILWAYS for the Year ended 31st December 1869.

Railway.	Number of Miles of Open Line.			Number of Miles of Sidings.	Passenger Traffic.										Goods Traffic.		
	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 Palkees.	Number of Horses.	Number of Dogs, &c.	Live Stock.			
					1st Class.	2nd Class.	Inter-mediate Class.	3rd Class.	Fourth or Coolie Class.					Total Number of Passengers.	Number of Cattle.	Number of Sheep.	Number of Pigs, &c.
East Indian (Main Line)	208	920	1,128	255	34,651†	118,020	491,334	4,285,508	—	4,910,417†	600†	1,219	5,006	2,810	744	84	16
(Jubbulpore Line)	—	223	223	19	2,988	10,000†	4,187†	1,80,037	—	1,82,359	—	89	408	885	25	—	—
Great Indian Peninsula	258	610	878	*	51,402†	102,138	—	1,558,208	1,289,491†	3,041,300	859	753	5,009	5,484	299	285,433	56
Madras (South-west Line)	—	492	492	61	7,001	86,870	—	1,402,232	169,193	1,654,518	1	771	3,890	2,458	884	4,448	790
(North-west Line)	—	216	215	27	888†	0,963	—	453,811	—	451,928†	—	228	1,093	671	254	145	23
Bombay, Baroda, and Central India	18	280	308	*	12,704	90,444	—	1,738,017	—	1,847,195	907	846	2,441	1,076	4,452	182,076	340
Scinde	5	104	109	43	1,419	3,072	—	94,002	—	95,553	00	53	232	506	—	18	—
" Punjab	—	246	246	26	5,478	18,550	—	648,736	—	658,165	—	98	589	1,308	30	113	—
" Delhi	—	284	284	84	0,065	82,894	—	649,351	—	711,659	—	178	2,701	3,345	33	61	—
Great Southern of India	—	168	168	13	1,374	8,332	—	800,820	—	810,822	—	415	530	431	—	—	—
Eastern Bengal	—	113	113	24	25,941	32,493	—	394,944	923,048	1,284,110†	185	100	820	1,207	66	99	—
Oude and Rohilkund (Main Line)	—	42	42	5	2,454†	7,375	—	337,331	—	347,380†	—	68	458	710	22	11	15
(Nulhatce Line)	—	28	28	*	838	2,377†	—	75,471	—	81,301	—	47	9	46	1	2	—
Indian Tramway (now Carnatic)	—	19	19	2	846	7,568	—	04,149	—	102,061	—	—	—	13	—	2	—
Calcutta and South-eastern (State)	—	28	28	10	1,233	4,409	44,208†	107,983†	860	249,330†	—	3	30	115	72	37	24

SUMMARY of TRAFFIC on the INDIAN RAILWAYS for the Year ended 31st December 1869—continued.

Railway.	Goods Traffic.				Number of Tons of Merchandise (exclusive of Live Stock and Minerals).	Number of Trains run.					Number of Miles travelled by Trains (exclusive of Shunting, &c.).						Number of Engines employed.	
	Minerals.			Number of Tons of Coal and Coke.		Passenger Trains.	Goods Trains.	Mineral Trains.	Mixed Trains.	Extra Trains.	Total Number of Trains.	By Passenger Trains.	By Goods Trains.	By Mineral Trains.	By Mixed Trains.	By Extra Trains.		Total Number of Miles.
	Number of Tons of Earth and Railway Materials.	Number of Tons of Minerals.	Total Number of Tons of Minerals.															
East Indian (Main Line)	267,278	17,842	—	235,121	988,829	2,222	7,978	2,153	17,787	6,827	36,945	150,792	2,431,942	155,459†	2,367,879†	908,760†	6,064,533†	421
(Jubbulpore Line)	—	—	—	—	75,441	—	—	—	2,278	818	1,480	—	—	—	225,550	84,432	410,623	23
Great Indian Peninsula	3,846	389,639	—	393,503	445,370	8,863	16,554	5,017	4,010	380	84,461	841,672	1,409,774	279,666	215,644	—	2,826,760	188
Madras (South-west Line)	1,103	50,790	—	51,893	283,136	—	—	—	0,722	—	7,102	—	—	1,108,385	19,641	—	1,128,528	60
(North-west Line)	475	27,956	—	28,430	79,283	—	—	—	3,328	571	3,899	—	—	311,431	43,559	—	854,566	32
Bombay, Baroda, and Central India	11,510	—	3,284	14,794	160,569	730	3,742	5,332	4,971	87	14,012	225,801	292,267	110,175	162,053	4,658	794,990	46
Scinde	490	9,240	18,847	28,583	78,355	60	274	175	724	111	1,350	8,984	27,241	3,892	69,061	1,383	116,110	17
" Punjab	—	—	—	—	81,619	—	1,012	—	2,570	—	3,582	—	—	—	210,242	—	205,120	30
" Delhi	—	—	—	—	118,408†	—	1,371	—	3,025	—	4,598	—	—	—	290,533	—	419,648	20†
Great Southern of India	—	4,479	—	4,478	59,001	—	—	—	3,156	—	2,154	—	—	—	298,105	—	298,105	17
Eastern Bengal	18,643	15,419	1,735	35,797	139,541	2,804	1,519	48	628	—	5,987	168,768†	143,487†	341†	52,584	153	365,336	4
Oude and Rohilkund (Main Line)	—	—	—	—	22,131	—	—	—	1,490	34	1,594	—	—	—	61,320	1,593	62,018	4
(Nulhatce Line)	1,854	9	103	1,966	8,171	—	—	—	730	84	824	—	—	—	20,440	2,446	22,886	4
Indian Tramway (now Carnatic)	—	—	—	—	8,829	—	—	—	1,453	62	1,515	—	—	—	27,607	1,178	28,785	4
Calcutta and South-eastern (State)	73	332	—	405	22,455	—	—	—	1,400	42	1,502	—	—	—	30,092	924	31,918	4

\* Not stated.

† Boas section worked by Punjab Railway engines.

SUMMARY OF TRAFFIC ON THE INDIAN RAILWAYS FOR THE YEAR ENDED 31st DECEMBER 1869.

Railway.	Fares per Mile.					Gross Receipts from Passenger Traffic.													Gross Receipts from Goods Traffic.												
	1st Class.	2nd Class.	Intermediate Class.		4th or Coolie Class.	Receipts from Passengers.										Total Receipts from Excess Luggage, Parcels, Carriages, Horses, Dogs, &c. conveyed in Passenger Trains.	Receipts from Mails.	Receipts from Special Trains.	Receipts from Troop Trains.	Total Receipts from Passenger Traffic.	Receipts per Train Mile from Passenger Traffic.	Live Stock.	Minerals.					Total Receipts from Goods Traffic.	Receipts per Train Mile from Goods Traffic.	Total Receipts from Passenger and Goods Traffic.	Passenger and Goods Traffic Receipts per Train Mile.
			1st Class.	2nd Class.		Intermediate Class.	3rd Class.	4th or Coolie Class.	Holders of Season or Periodical Tickets.	Total Receipts from Passengers.	1st Class.	2nd Class.	Intermediate Class.	3rd Class.	4th or Coolie Class.								Coal and Coke.	Earth and Railway Materials.	Other Minerals.	Total Receipts from Minerals.	General Merchandise.				
			pies.	pies.		pies.	pies.	pies.	£	£	£	£	£	£	£								£	£	£	£	£				
East Indian (Main Line)	18	9	4	3	—	35,404	60,592	30,246	441,823	—	2,929	571,030	64,252	12,834	3,210	27,148	678,532	2'22	698	134,380	40,452	—	174,832	1,572,952	1,746,474	5'73	2,427,006	7'06			
"    (Jubbulpore Line)	18	9	4	3	—	2,992	8,107	742	21,113	—	—	32,987	3,595	2,787	72	3,116	42,561	2'07	2	—	—	—	—	51,859	51,861	2'52	94,428	4'60			
Great Indian Peninsula	18	9	—	4	2½	23,680	31,005	—	160,704	93,000	1,224	316,282	44,450	440	2,554	—	363,744	2'56	7,728	4,462	60,896	—	65,368	932,455	1,055,541	7'44	1,419,283	10'00			
Madras (South-west Line)	18	6	—	3	2	11,327	12,888	—	104,155	5,739	7	124,110	17,051	—	884	1,038	153,410	2'71	544	591	23,150	—	23,730	219,920	244,238	4'33	397,662	7'04			
"    (North-west Line)	18	6	—	3	—	910	1,208	—	50,004	—	—	32,188	4,097	—	36	—	36,311	2'04	109	276	21,854	—	22,120	81,410	103,645	5'84	130,958	7'88			
Bombay, Baroda, and Central India.	15	7	—	4	—	4,593	10,645	—	152,995	—	861	169,094	15,410	100	2,718	—	187,301	4'71	6,022	6,233	10,405	1,770	18,498	225,410	250,866	6'31	438,267	11'02			
Scindo	*	*	—	*	—	734	990	—	10,858	—	1	12,580	1,271	—	51	—	13,911	2'39	—	10	512	1,226	1,767	56,193	57,949	9'08	71,860	12'37			
"    Panjab	18	9	—	2½	—	1,881	2,422	—	29,854	—	—	34,157	2,027	108	—	—	37,192	2'52	35	—	—	—	—	58,120	58,154	3'08	95,347	6'50			
"    Delhi	18	9	—	3	—	5,175	10,871	—	43,905	—	—	60,011	10,334	60	—	—	70,426	3'36	26	—	—	—	—	87,957	87,983	9'76	128,468	6'12			
Great Southern of India	18	5	—	3	—	645	994	—	36,739	—	—	40,378	2,138	—	110	—	42,632	2'36	36	—	2,171	—	2,171	24,225	26,432	1'77	60,064	4'68			
Easteru Bengal	18	9	—	4½	3	4,118	2,619	—	15,058	42,558	446	64,829	5,573	—	57	46	70,304	3'84	25	5,031	8,188	511	14,630	77,016	91,671	6'01	161,975	8'86			
Oude and Rohilkund (Main Line).	18	9	—	2	—	982	957	—	12,004	—	—	13,913	1,019	—	10	—	15,372	4'05	5	—	—	—	—	5,882	5,367	1'71	20,959	6'06			
"    (Nulhatee Line)	30	15	7½	5	—	278	373	245	4,047	—	—	4,043	513	—	450	—	5,906	5'10	1	416	2	16	434	1,094	2,420	2'12	3,336	7'28			
Indian Tramway (now Carnatic)	20 18	6	—	4	—	53	410	—	3,453	—	—	3,916	56	—	—	—	3,972	2'70	—	—	—	—	—	820	856	5'59	4,823	3'85			
Calcutta and South-eastern (State).	18	9	4½	3	1½	193	224	714	3,015	6	—	4,187	254	—	9	—	4,450	2'78	22	8	30	—	38	2,158	2,218	1'88	6,608	4'17			
Totals						92,985	145,001	31,950	1,077,007	141,193	5,408	1,404,509	174,167	16,308	9,897	31,373	1,726,322	2'60	16,133	162,316	107,735	3,323	323,574	3,417,990	3,757,000	5'68	5,494,028	8'27			

\* Not stated.

STATEMENT showing the EXPENDITURE on REVENUE ACCOUNT for the Year ended 31st December 1869.

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 Damage 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.	Coaching.		Merchandise.		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.														
East Indian (Main Line) - - -	£ 178,561	d. 7'03	£ 390,955	d. 14'00	£ 93,275	d. 3'07	£ 224,025	d. 8'88	Entered under Coaching.	-	£ 3,837	d. '15	£ 265	d. '01	£ 1,908	d. '07	£ 1,187	d. '04	£ 151,600	d. 5'97	£ 1,035,502	d. 3'89		
"    (Jubbulpore Line) - - -	23,104	13'52	63,936	37'42	6,043	3'80	13,272	7'77	Entered under Coaching.	-	23	'01	12	'007	87	'05	-	'01	10,339	6'05	117,443	5'72		
Great Indian Peninsula - - -	291,307	24'64	390,304	27'61	86,020	7'23	45,258	8'68	143,578	12'15	3,513	'82	3,478	'29	Cr. 814	Cr. '07	2,748	'23	65,645	5'36	997,427	6'82		
Madras (South west Line) - - -	92,701	19'71	74,500	15'88	6,340	1'34	11,181	8'38	21,230	4'51	291	'00	-	-	14	'03	49	'01	12,238	2'60	218,543	3'87		
"    (North-west Line) - - -	9,987	6'75	22,556	15'26	2,016	1'36	1,078	1'34	6,110	4'14	94	'06	-	-	1	'00	1	'00	15,214	10'29	57,976	3'27		
Bombay, Baroda, and Central India - * 101,069	30'51	81,875	24'71	36,768	11'09	15,366	4'64	22,606	6'82	2,677	'80	51	'01	1,890	'41	1,027	'51	72,181	21'79	335,208	8'45			
Scinde - - - - -	17,159	35'47	20,573	42'52	2,437	5'04	12,064	20'21	Entered under Coaching.	-	26	'05	-	-	1,239	2'58	22	'04	7,205	14'99	61,245	10'37		
"    Punjab - - - - -	20,741	16'99	50,905	25'20	4,039	3'28	17,090	14'37	Entered under Coaching.	-	22	'01	-	-	1,039	'84	97	'07	24,773	20'14	99,386	6'73		
"    Delhi - - - - -	3,818	2'07	30,535	20'89	1,708	'08	27,868	15'94	Entered under Coaching.	-	-	-	-	-	344	'20	34	'02	10,194	5'88	80,224	3'63		
Great Southern of India - - -	13,634	10'97	15,902	12'72	2,646	3'12	5,227	4'20	Entered under Coaching.	-	799	'64	-	-	33	'02	19	'01	6,264	3'05	44,443	2'97		
Eastern Bengal - - - - -	18,467	12'13	23,503	15'43	3,997	2'55	16,164	10'03	2,290	5'45	1,250	'82	-	-	507	'33	-	-	3,332	5'60	80,599	4'11		
Oude and Rohilkund (Main Line) - - -	2,808	16'71	5,903	22'52	1,267	4'81	4,423	16'36	Entered under Coaching.	-	-	-	100	'38	107	'40	3	'01	2,790	16'04	17,493	5'53		
"    (Nulhatas Line) - - -	1,214	12'73	1,559	16'33	687	7'20	842	8'83	Entered under Coaching.	-	-	-	-	-	-	-	-	-	746	7'79	5,043	4'40		
Indian Tramway (now Carnatic) - - -	1,059	8'48	1,124	9'57	68	'57	673	5'01	144	1'20	-	-	-	-	-	-	-	-	842	7'02	3,910	2'71		
Calcutta and South-eastern (State) - - -	3,103	23'38	2,696	20'19	239	1'72	2,369	17'36	Entered under Coaching.	-	173	1'29	-	-	-	-	1	'007	2,278	17'12	10,573	6'76		
Totals - - - - -	778,589		1,043,893		246,027		606,920		Under Coaching.		12,204		3,906		5,835		5,200		390,957		3,135,497	4'72		

\* Of this 34,600l. was expended in repairs rendered necessary by the extending floods in 1868.

RECEIPTS and EXPENSES per Train Mile for the Years 1867-68 and 1868-69, ending 30th June.

Railway.	Gross Receipts.		Expenses.																			Net Receipts.		
			Maintenance.		Locomotive.		Rolling Stock.		Traffic.		Rates and Taxes.		Personal Compensation.		Compensation for Damages.		Legal.		Miscellaneous.		Total.			
	1867-68.	1868-69.	1867-68.	1868-69.	1867-68.	1868-69.	1867-68.	1868-69.	1867-68.	1868-69.	1867-68.	1868-69.	1867-68.	1868-69.	1867-68.	1868-69.	1867-68.	1868-69.	1867-68.	1868-69.	1867-68.	1868-69.	1867-68.	1868-69.
East Indian :—Main Line	s.	s.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	s.	s.	s.	s.
" Jubbulpore Line	*	6.	*	16.	*	38.6	*	3.9	*	9.1	*	0.03	*	0.01	*	0.1	*	0.02	*	6.3	*	6.2	*	†
Great Indian Peninsula	9.8	10.2	17.8	22.1	29.	28.4	5.7	6.5	14.9	14.4	—	0.03	4	8	0.16	8	0.07	0.42	6.8	5.1	6.2	6.5	3.6	3.7
Madras :—South-west Line	7.	7.	18.4	14.7	13.3	15.	1.3	1.3	6.6	6.9	0.05	0.06	—	—	0.01	0.003	0.02	0.001	2.6	2.4	3.1	3.3	3.9	3.7
" North-west Line	9.	8.4	7.3	8.7	13.4	13.5	1.4	1.3	5.4	5.2	—	0.06	—	—	0.001	—	—	—	10.5	10.1	3.2	3.2	5.8	5.2
Bombay, Baroda, and Central India	11.6	12.5	27.6	22.3	30.9	31.7	11.5	8.3	14.4	19.8	2	0.32	—	0.001	7	1.68	6	2	12.1	19.9	8.2	8.7	3.4	3.8
Scinde	10.4	15.1	28.1	29.3	39.5	42.1	4.4	6.6	21.	29.6	—	—	—	—	—	8	0.16	0.14	10.2	14.7	8.2	10.3	2.2	4.8
Punjab	5.2	6.1	9.7	14.3	16.6	21.5	1.	1.6	10.3	12.3	0.12	0.04	—	—	0.08	4	0.01	0.06	8.4	14.8	3.9	5.4	1.3	0.7
Delhi	8.8	5.9	0	2.4	31.3	21.9	2.3	0.9	25.8	14.8	—	0.01	—	—	2	2	—	0.002	9.9	6.	5.8	3.8	†	2.1
Great Southern of India	4.7	4.7	5.3	6.1	18.5	12.8	2.7	2.7	3.8	4.	—	0.15	—	—	—	0.04	—	0.006	1.9	3.9	2.2	2.5	2.5	2.2
Eastern Bengal	8.5	9.2	10.7	12.7	13.	15.	3.1	2.4	11.5	16.4	0.11	0.13	—	—	0	2	0.14	—	10.5	5.8	4.1	4.4	4.4	4.8
Oude and Rohilkund, Main Line	7.3	7.2	1.5	11.2	18.1	27.4	4.8	4.7	17.	17.6	—	—	—	0.38	0.06	3	—	—	—	16.	5.3	6.4	2.	0.8

Average gross receipts, 1867-68, 8.5s.; 1868-69, 9.5s.  
 Average gross expenses, " 5.4s.; " 5.8s.

\* Not stated.

† This year there was a deficit of 0.2s.

‡ This year there was a deficit of 2s.



## MISCELLANEOUS.

Weights and  
measures.

56. The inconveniences arising out of the diversity of weights and measures in India have long been felt, and railways have helped, by the more frequent dealings which they have occasioned between different parts of the country where variations exist, to expose the evil. After much discussion on the subject in India, the Government came to the conclusion that it would be better in the first instance to confine any alteration to the system of weights, leaving the question of measures for future consideration, and that, instead of adopting the English system, it would be preferable that the new unit of weight should be a seer, equal to the kilogramme of 2·205 lbs. avoirdupois, and that a system of decimal multiples and subdivisions should form a fundamental part of the new scale. An Act has been passed by the Indian Legislature to give effect to this conclusion, and the early adoption of the kilogramme as the unit of weight on Indian railways may be expected.

Volunteer force.

57. It has been mentioned in a former report that a Volunteer force had been formed by the officers and men of the East Indian Railway staff. During the year its numerical strength increased from 404 to 844.

## EAST INDIAN RAILWAY.

Chord line.

58. The only portion of this undertaking which remains to be brought into use is the Chord line, and this will be ready for public traffic by October next. A capital of about 2,250,000*l.* will then be made productive. The earnings of the Main line have been applied towards paying the guaranteed interest on the sums expended upon the Chord line during its construction. Notwithstanding this, however, and that 20,000*l.* had to be paid out of the profits of the half year ending the 30th June, for interest on advances made by the Government in a previous year, as well as 10,000*l.* to meet the deficient earnings of the Jubbulpore line, surplus profits over 5 per cent. were realised by the Main line, and a sum of 16,26,109 rupees was divided between the Government and the Company. This success was as much due to the economical working of the line as to its increased receipts. While the earnings per train mile increased from 8·1*s.* to 8·8*s.*, the expenses diminished from 4·0*s.* to 3·5*s.* The total expenditure amounted to only 41·72 per cent. of the gross receipts.

Profits.

Junction with  
Great Indian  
Peninsula Rail-  
way.

59. The completion of the Great Indian Peninsula Railway to Jubbulpore, where it joins the East Indian Railway system, will have a beneficial effect upon this Company's operations, which have necessarily been seriously checked by the abrupt termination of the Jubbulpore line in the centre of India.

## GREAT INDIAN PENINSULA RAILWAY.

Opening of line to  
Jubbulpore.

60. The great event connected with this Company's system has before been alluded to, viz. the completion of through communication between Bombay and Calcutta as well as the North-west of India by the opening of the line to Jubbulpore. Great efforts had been made by the Company's officers at the instance of Government to push on and finish the works so as to enable His Royal Highness the Duke of Edinburgh to be present at the ceremony of opening the line. This, as previously stated, took place on the 7th March last, when the Viceroy and the Duke and other distinguished visitors joined in doing honour to the occasion.

South-eastern  
branch.

61. The length thus added to the open line was 241 miles. In the early part of last year 70 miles on the South-eastern Branch, extending from Sholapoor to Koolburga, were also opened for traffic, leaving about 88 miles to Raichore to complete the Company's system. It is expected that this section, with the exception of the bridge over the Kistna river, will be ready for opening this year.

Khamgaon line.

62. The small branch of about 8 miles from Jhellum, on the Nagpore branch, to Khamgaon, constructed by the Government from the Berar revenues, is being worked by this Company. Another similar branch to Oomrawuttee is also about to be laid down by the Government, the funds being supplied in a similar manner. Arrangements have likewise been made with Maharajah Holkar for constructing a branch from the North-east line of this railway to Indore; and with the Nizam for taking a line from Koolburga, above mentioned, to Hyderabad.

Indore line.

Hyderabad line.

All these will promote the interests of the Great Indian Peninsula Railway by bringing important commercial places as well as the capitals of two progressive Native States into communication with it.

63. The traffic returns for last year cannot be regarded as satisfactory. There has been a falling-off both in passengers and merchandise, and the expenses for maintenance and working have increased. These results are due in some measure to the depressed state of trade. The falling-off in the cotton traffic alone during the last half year amounted to 2,66,669 rupees, or at 1s. 10*d.* the rupee, 23,611*l.*, as compared with the corresponding period of 1868. Traffic.

#### MADRAS RAILWAY.

64. A length of thirty miles was added to the open portion of this railway during the year, and the works in continuation of the line towards Raichore, where it is to meet the Great Indian Peninsula Railway, are progressing towards completion. The large bridge over the Toongabuddra river, which consists of 58 girder openings of 70 feet each, is described as a very fine work, and as having been skilfully and substantially executed. It will be finished in the course of this year. Increase of line.

65. The only remaining portion of this Company's works will then be the branch from Coimbatore on the South-west line to the foot of the Neilgherry Hills, upon which operations have begun.

66. On the 22nd March His Royal Highness the Duke of Edinburgh crossed the peninsula from Beypore to Madras by this railway in 12½ hours, a distance of 406 miles, an hour and a half having been spent in stoppages for refreshment, &c.

67. The traffic was injuriously affected by the stagnant state of trade and by outbreaks of cholera in certain districts. Traffic.

#### BOMBAY, BARODA, AND CENTRAL INDIA RAILWAY.

68. The extension of this line from Ahmedabad over the Saburmuttee river was completed this year. Its continuation to Veerungaum and Wudwan has also been decided on and a new contract was made with the Company for carrying it out. The plans and estimates have been prepared, and a commencement will be made with the works as soon as the orders of the Government of India are given. The permanent way material has been ordered. Wudwan Extension.

69. It was mentioned in last year's report that Mr. Hawkshaw had been asked to give his opinion as to the strength of the bridges on this line and their suitability for the rivers over which they are taken. It will be recollected that in one or two instances they had been damaged by floods. Mr. Hawkshaw's opinion is that the bridges are economical in design for situations to which they are adapted, but he considers that the spans are too small and the columns too high for rivers of great depth and for those which bring down trees and drift-sand, as the Taptee and Nerbudda do. Their failure he attributed to inherent weakness of structure, and recommended the continuation of the remedial measures which had already been taken; but he suggested, that to be perfectly and permanently secure, cylinders should be substituted for screw piles. Bridges.

70. The Bombay terminus of this railway has at length been fixed at the gun carriage site at Colaba. The capital expenditure on the original line will now be confined to the works of this station and to the strengthening of the bridges. Bombay terminus.

71. The traffic during the past year has increased both in passengers and goods, but the working and maintenance charges have been very high, amounting to 77·70 per cent. of the gross receipts. Considerable reductions have been made in the establishment and other expenses, which will tell favorably upon future traffic. Traffic.

#### SCINDE, PUNJAB, AND DELHI RAILWAY.

72. The four different undertakings which have hitherto comprised this Company's system will, in future, form one concern, under the title above given. Authority for the amalgamation was obtained from Parliament last session, and the contract carrying it out has been formally concluded between the Government and the Company. The line of communication in the hands of the Company extends from Kurra-  
chee to Delhi, via Kotree, the river Indus to Moulton, Lahore, Umritsir, Umballa, and Meerut, a distance in the whole of about 1,150 miles. It is in contemplation Amalgamation.

Indus Valley line. to substitute a railway for the flotilla, which now conducts the traffic on the river, and surveys are being made, under the orders of Government, to ascertain the best route for a railway along the valley of the Indus.

Delhi line. 73. The works on the Delhi section have been carried on with vigour, and a few miles only, between Loodianah and Umritsir, remain to complete the whole line. The river Sutlej occurs on this portion, and it has been necessary to lengthen the bridge over it in consequence of its having shifted its course since the line was laid out. On the Seinde line further trouble has been occasioned by the violent flood

Damage by floods to Seinde line.

of the Mulleer river; the viaduct over it, which was carried away by the force of the floods in 1866, has a second time been seriously injured. After the former disaster, it was re-erected with larger openings, obtained not by widening, but by raising the piers on which the girders rested. The flood occurred on the 12th September, and seven out of twenty-one spans were washed away. To shew the rapidity with which the floods subside, as well as rise, I may mention that the line was actually relaid upon the dry bed of the river within a fortnight after the bridge had been swept away. Mr. Bidder, the consulting engineer to the Company, recommends that instead of reconstructing the viaduct, the line should be lowered so as to allow future floods to pass over it.

Floating dock.

74. The floating dock for the flotilla, which was sent out from England, was erected at Kotree, and successfully floated in July last, under the supervision of Captain Wood, the agent. This dock is 300 feet long, 80 wide, and has a draft of  $12\frac{1}{2}$  feet, and cost 25,000*l*. It is, I believe, the first floating dock that has been introduced into India.

Traffic.

75. The traffic during the year has suffered from the stagnation of trade, and the disjointed character of the lines. The completion of the line between Umritsir and Loodianah, and the connexion thereby of the Punjab with Delhi and Central India, will, it is hoped, produce a considerable increase in the commercial relations between those provinces.

Bray arbitration case.

76. The arbitration case, in which this Company was engaged, in consequence of an action brought against them by Mr. Bray, the contractor, has not yet been finished. The evidence on both sides has, however been concluded, and it remains only for the counsel on either side to make their concluding speeches, and then for the arbitrator to make his award. When this will take place I am unable to say. The case has continued now for more than nine years, and on the side of the Company alone, nearly 26,000*l*. have already been expended. A better example of the dilatory and altogether unsatisfactory nature of this kind of tribunal could hardly, perhaps, be adduced.

### EASTERN BENGAL RAILWAY.

Goalundo extension.

77. The opening of the extension line to Goalundo has been delayed by the damage done to the bridge works on the Goraie river by a violent storm in June last, described in a former part of this report. The cylinder which was lost has been replaced, and the works have been carried on with energy by Mr. Leslie, the chief engineer, who expects to have them finished and the line ready for opening by November next.

Darjeeling extension.

78. Surveys are being made for proposed extensions of this line higher up the river Ganges, and towards Darjeeling.

Traffic.

79. The traffic, like that on other lines, has suffered from the condition of trade.

### GREAT SOUTHERN OF INDIA RAILWAY.

Tuticorin extension.

80. It has been decided during the year to extend this Company's operations, by continuing the line in a southerly direction to the port of Tuticorin. This will more than double the size of the undertaking, which formerly consisted of 168 miles, and now of 378 miles. Nothing further than surveys has yet been done. The Company having entered into a fresh contract with the Secretary of State in Council, have raised the necessary capital, appointed a staff of engineers, and provided the permanent way, and are now only awaiting orders from the Government of India to begin the work of construction with vigour. They hope to complete it at the rate of 7,000*l*. per mile.

Traffic.

81. The traffic on the open line during the year has been nearly stationary, compared with the previous year.

## OUDE AND ROHILKUND RAILWAY.

82. Almost all the lines comprised in this system are now in hand. There has been delay in commencing some of them, but the works are light, with the exception of two or three bridges, and there is every disposition on the part of the company and its officers to proceed vigorously and rapidly with their execution, so that good progress may be expected during the year. One hundred miles in addition to the line between Cawnpore and Lucknow are expected to be opened early next year. The branch to the Kumaon Iron Works has not yet been commenced, but it has been decided to take it from Moradabad, and the survey of it as far as Ramnuggur has been made. The permanent way and iron girders for the bridges are being despatched to India, besides a sufficient supply of locomotives and rolling stock for 300 miles, and a contract has been made with a firm in this country for the erection in India of the superstructure of the bridge across the Ganges at Cawnpore. Nearly 48,000 tons of materials have been shipped from England during the year and have been conveyed up country, the greater part by the Eastern Bengal Railway and the river steamers, the rest by the East Indian Railway, to their destination. Progress or new lines.

83. The traffic receipts on the open line have been low in consequence of the general depression throughout the Province from famine and trade. Traffic.

## CARNATIC RAILWAY.

84. A contract has been entered into with this company for the conversion of their light narrow gauge railway between Arconum and Conjeveram into a 5 ft. 6 in. line, and for extending it to Cuddalore. Capital to the extent of 800,000*l.* has been issued, and surveys and plans are being made by the company's officers in India.

## STATE LINES.

85. The State lines at present consist of the "Calcutta and Canning Railway," which was purchased from the Calcutta and South-eastern Railway Company, the Northern Punjab Railway, and the Jhellum and Khamgaon; but the Government have also commenced surveys for lines in Rajpootana, for one between Karwar and Hooblee, for the Indus Valley, and for a short branch to Oomrawuttee from the Great Indian Peninsula Railway.

## CALCUTTA AND CANNING RAILWAY.

86. This line was worked by the Eastern Bengal Company for Government up to February last, when it was placed in the hands of Major F. S. Taylor, R.E., who has introduced a new system of working arrangements, after the American fashion, whereby he thinks the expenses will be reduced and the traffic more efficiently conducted. Its main features, Major Taylor says, are these:—"1st. The running of the trains to be regulated solely by the traffic superintendent from head-quarters, and the station masters throughout the line have been superseded by booking clerks, who, in most instances, are now also telegraph signallers. 2nd. The trains are worked by a competent conductor, who is responsible for and does the shunting, the pointsmen and signallers at the road-side stations having been abolished with the station masters and semaphore signals." These arrangements are of course only adapted to lines where the traffic is small, and where speed is no object; but it is always the mark of good management to suit the means to the end. Reductions have also been made in the rates and fares, and there are only two classes of passenger carriages, the charges being nine and three pies per mile. New system of working.  
Reduction of fares.

## NORTHERN PUNJAB RAILWAY.

87. The surveys of this line between Lahore and Jhellum have been completed, and construction has commenced on 100 miles. The surveys beyond Jhellum, between that place and Rawul Pindee, are now approaching completion. Designs and estimates have been prepared of the three great bridges over the Ravee, Chenab, and Jhellum. Mr. Lee Smith is now in this country with the plans, and contracts for the iron works are about to be made. The bridges are to consist

of two parallel girders, carrying the railway, which is also to be used as a carriage way above and a footway between. Permanent way for 100 miles has been sent out. It has been decided to appropriate half of the Grand Trunk Road to the railway, except where the nature of the country makes diversions desirable; but these exceptions do not occur for any great distance. The present rough estimate of the cost of this line is about 3,000,000*l.*

#### JHELLUM AND KHAMGAON.

88. This line, which proceeds from Jhellum on the Nagpore branch of the Great Indian Peninsula Railway to Khamgaon, a great cotton mart in Berar, is about eight miles in length, and was constructed by the Government out of the Berar revenues. It was begun in June last, and was opened by the Viceroy, in the presence of His Royal Highness the Duke of Edinburgh, in March. No account of its exact cost has been received, but it has been put down at 40,000*l.* The outlay was increased by the rapidity with which the work was executed, the operations being conducted during the rains. An additional expense was also incurred by borrowing permanent way from the Oude and Rohilkund Company, the carriage of which from Calcutta added, it is estimated, 4,000*l.* to the cost. The line is now being worked by the Great Indian Peninsula Railway Company.

89. Another small branch, similar to this, is also about to be made by the Government from the Great Indian Peninsula Railway to Oomrawuttee. It will be 6½ miles in length, and is estimated to cost 5,000*l.* a mile.

#### KARWAR AND HOOBLEE.

90. The surveys which were made for this line by Mr. Buchanan were not encouraging as regards its cost, which he estimated at 20,000*l.* a mile. The ascent of the ghâts, as proposed by Mr. Buchanan, would be obtained by an incline 4 miles 8 chains in length, with a gradient of 1 in 17, with the exception of 12 chains, which is level. For 50 miles out of its length of 95 miles, the line runs through dense jungle. Under these circumstances, the Secretary of State came to the conclusion that unless the result of the further surveys now being made were more satisfactory, "there will be no alternative but to give up all immediate idea of a railway, or, as the Government of India suggest, to adapt the line generally to slow speeds and small trains." It is probable that a narrow gauge and a lighter system will at any rate be thought advisable.

#### SUMMARY AND CONCLUSION.

Mileage and cost.

91. There are now 4,628 miles of railway open in India, which have cost about 79,000,000*l.* The exact amount can hardly be given; but it must be borne in mind that the expenditure of 84,200,000*l.*, which had been incurred to the end of the year, represents not only the open portion but many miles still in course of construction. During last year 261 miles were opened for traffic, and 317 miles have been added since. The latter included that portion of the Great Indian Peninsula Railway which completes the great transpeninsula line between Bombay and Calcutta, and also the first line, viz., from Jhellum to Khamgaon, which has been undertaken and completed by the State.

Capital.

92. The amount of capital raised by the companies during the year ending the 31st March was 4,269,252*l.*, and there was a balance of 3,202,119*l.* to their credit at the beginning of the year. They have expended 4,393,027*l.*, and it is estimated that during the present year they will expend 5,021,800*l.*, and the Government 1,229,800*l.*

Shipments.

93. Materials to the amount of 211,750 tons, which cost 1,432,784*l.*, have been despatched from this country during the year, making, with the shipments of former years, a total amount of 3,929,799 tons, of the value of 26,484,919*l.*, that has been sent to India for the railways.

Stock.

94. The locomotive and rolling stocks now consist of 1,174 engines, 3,113 passenger carriages, and 22,393 trucks and wagons.

Proprietors.

95. The number of shareholders on the 31st December last was 48,793; and there were 7,624 debenture holders. Of the proprietors of shares 47,985 were in England and 808 in India, 394 of those in India being natives.

96. The accidents during the year present a heavier list than usual. Thirty-one passengers were killed, being 1.87 per million of tickets issued. Two accidents alone occasioned the death of 30, one on the Great Indian Peninsula in January 1869, when 19 were killed and 42 injured, and one on the Bombay and Baroda in June, when 11 were killed and 7 hurt. Casualties.

97. The number of passengers was 16,011,633, compared with 15,066,530 in the previous year; the third class being 15,247,516, as against 14,401,000. The train mileage was 12,318,086 last year, and 11,980,319 the year before. Passengers.

98. The gross receipts last year were 5,709,382*l.*, as compared with 5,320,723*l.* of the previous year, and the net receipts 2,520,952*l.*, compared with 2,522,622*l.* The railways were thus earning, last year, at the rate of about 3*l.* 4*s.* 6*d.* per cent. per annum on the capital expended on them; 1,380,000*l.* short of the guaranteed interest payable on such expenditure, and 1,412,919*l.* less than the amount paid for guaranteed interest on the whole capital raised, including that employed on unopened lines and the unexpended portion as well. Revenue.

99. The time is now not far distant when the capital accounts of most of the guaranteed lines will be free from any considerable additions. This cannot but be regarded as a satisfactory feature in the position of the affairs of these railways. When there is no longer a large amount of expenditure yielding no return, and when the annual average outlay on maintenance and working expenses is reduced from 60 and 70 per cent. of the gross receipts, which it has been in some cases during the past year, to 41.72 per cent., as it was on the East Indian Railway, hopes may fairly be entertained of the financial success of the system. About certain undertakings there can already be no doubt. Future prospects.

(100. It is now just 20 years ago since the first sod of an Indian railway was turned. At that time it was decided to confine operations to two small experimental lines, 150 miles in length, one of 120 miles in Bengal, the other of 30 in Bombay. In four years these were opened, but before that time arrived, Lord Dalhousie, then Governor-General, had proposed, and the home authorities had approved of, the system of railways which is now approaching completion.) At first only three Companies were employed to carry out works in each Presidency; but subsequently other lines were grafted upon the original system and additional Companies were formed. Thus there are now nine Companies engaged in constructing and working railways in India. Progress of lines.

(101. With regard to the future extensions contemplated, many of which the Government propose to undertake without the intervention of Companies, although the main channels of communication have been provided with railways by the present system, the experience which has been gained in regard to the execution of works of this kind and the best mode of obtaining materials for them, as well as the improved and cheaper means of conveying the permanent way and stock to their destination, furnish good ground for the expectation that, under a properly organised system of management, well selected lines will be laid down at much less cost than the existing ones, and will be profitably worked, whether they are constructed upon the standard gauge or a narrower one.) Future extensions.

I have the honour to be,

My Lord Duke,

Your Grace's very obedient humble servant,

JULAND DANVERS.

## APPENDIX.

### APPENDIX A.

#### FROM CAPTAIN H. W. TYLER TO THE BOARD OF TRADE.

SIR,

1, Whitehall, 4th March 1870.

I HAVE now the honour to report, for the information of the Board of Trade, that, in compliance with the instructions in your Minute of the 8th ultimo, I attended certain experiments on the 11th, 12th, 14th, and 15th ultimo on the Festiniog and Mid-Wales Railways.

The object of these experiments was to test the capabilities of the Festiniog Railway, which has a gauge of rather less than 2 feet; and also the powers and comparative steadiness of double bogie engines, such as have been designed by Mr. Fairlie, both on the Festiniog Railway and on the ordinary gauge of 4 ft. 8½ in.

The trials were made in the presence of various members of an Imperial Commission, under the Presidency of Count Alexis Bobrinsky, who visited England for these special purposes, as well as of His Grace the Duke of Sutherland, and numerous others from various countries, including Major-General Sir William Baker, R.E., and Mr. Thornton and Mr. Juland Danvers from the India Office.

I beg to enclose herewith detailed statements of the experiments, in the form of the original documents, drawn up by myself in the presence of those who witnessed them, and containing descriptions of the engines employed.

As regards the Festiniog Railway, they quite bore out what I stated in regard to it in my reports to the Board of Trade six or seven years since, previously to its being opened for passenger traffic, and those contained in a paper which I subsequently read at the Institution of Civil Engineers. The amount of traffic which can be economically carried upon this little railway, and the speed at which it can be conveyed round curves which would be absolutely impracticable under the ordinary system of railway working, render it a most instructive example, showing how, by a reduction of gauge, adaptation of rolling stock, and judicious arrangements, cheap railways on narrower gauges may be advantageously constructed in our colonies, in foreign countries, and even in parts of the United Kingdom. The precise gauge in such cases should, however, be suited to the local circumstances of each particular locality, and must depend upon various considerations which it is not necessary here to detail.

When the Festiniog Railway was first opened for passenger traffic, the Board of Trade, on my recommendation, made it a condition that the speed should be limited to 10 or 12 miles an hour. And this was done on account of the narrowness and lowness of the works, the condition of the permanent way, and the novelty of the system of applying locomotive power to so narrow a gauge. Since that time the permanent way has been materially improved, and the greater part of it has been relaid with heavier rails, fished at the joints. The system has also been thoroughly tested, and there appear to have been no accidents to passengers. But the narrowness and lowness of the works remain, and this is now the weak point of the line.

At certain bridges on the line, and other places, extra height and width might, apparently, without so much difficulty or expense, be afforded, and the Company would do wisely in making such improvements, as far as practicable; but the enlargement of the tunnels, and of the width in certain other places, would, no doubt, be very costly.

The speed appears to have been increased from time to time, as the permanent way has been improved, and it would now, I think, be only right to release the Company from the obligation which was imposed upon them in this respect, on their first opening for passengers. As they have hitherto conducted the traffic with safety to the public for so many years, the question of speed might now properly be left to their own discretion, not with the idea that they are to run their passenger trains at the comparatively high speed of which the little line has so curiously shown itself to be capable, under the system of low centres of gravity, which has so wisely been adopted for the rolling stock, but with confidence that they will keep well within that speed, and allow ample margin for all contingencies, such as cannot always be foreseen, even under the most careful management.

As regards Mr. Fairlie's double bogie engines, the experiments have shown, not only that the principle upon which they are designed, 1st, of reducing wear and tear and friction by the employment of the bogie system; 2nd, of conveniently accumulating the weight upon the wheels, so as to make all the wheels into driving wheels; and, 3rd, of providing engines which can run in either direction with equal safety,—are sound, but also that the narrower the gauge the more profitably they can be employed for through traffic.

I have, &c.  
(Signed) H. W. TYLER.

The Secretary, Railway Department,  
Board of Trade.

## APPENDIX B.

## PRELIMINARY MEMORANDUM FOR GUIDANCE OF OFFICERS APPOINTED TO DRAW UP PROJECTS OF PROPOSED STATE RAILWAYS.

THE lines should be designed for a traffic worked at a moderate speed, say not exceeding 15 miles an hour, and as respects the substructure and way, they should be first class, solidly-constructed railways, on the standard 5 feet 6 inches gauge, but throughout, and with no exception, for a single tract only.

2. This limitation will not prevent consideration of the expediency of laying in the foundations of any particular work for a double tract, but any case in which that course may seem proper will have to be separately brought forward.

3. Everything should be designed from the first to suit the working on a single line, special arrangements for crossings between stations being, if necessary, made.

4. Economy of first outlay is to be studied to the utmost in all the adjuncts, and to this end, station buildings, &c. should be of a simple and inexpensive character, the accommodation being restricted to the expected present wants of the traffic. Raised platforms should be dispensed with excepting only at principal or terminal stations where a large passenger traffic may be expected.

5. Buildings likely to be subjected to the vibration caused by trains or engines in motion should be built in a perfectly solid manner with the best lime mortar; but other buildings may commonly be constructed in a less costly manner, with burnt or half-burnt brick and mud, with foundations in lime only, or otherwise, so as to secure economy to the utmost, while the essential object of the work is obtained.

6. All buildings to be used as residences during construction, should, wherever possible, be placed so as to admit of their being utilised, when the line is opened, as stations or quarters for the permanent railway staff. If this cannot be arranged, these buildings should be of the most temporary nature possible, so as to last their purpose, but nothing more.

7. As respects costs, the essential point to be borne in mind is, that the road and the machinery for working it shall be first class; but that in every other particular the bare necessities only of the traffic shall be provided for without indulging in luxuries or comforts, which may be postponed till demanded by the traffic.

8. The formation width for a single line should not exceed 18 feet in bank and 24 feet in cutting, and in difficult ground, or where the soil will admit of a reduction without inconvenience, these widths may be reduced by at least 2 feet.

9. Where the track is double the formation may be increased by 12 feet, subject, however, to a greater width than this allows between tracks in stations.

10. The width of ballast at sleeper level should not exceed 10 feet; depth below sleepers, 12 inches.

11. The width of bridges and culverts should be reduced to a minimum, say 10 or 12 feet, consistently with true economy when in bank. Large bridges may be simply wide enough to carry the rails, with footways on either side for maintenance purposes, unless the combination of an ordinary roadway be determined on.

12. A ruling gradient of  $\frac{1}{300}$  should be aimed at. When circumstances make the adoption of a more severe gradient expedient either exceptionally or generally, throughout a line, they should be specially represented for orders. In every level country a ruling gradient of  $\frac{1}{600}$  may be adopted.

13. Curves should not, as a rule, be of sharper radius than 2,500 feet, except in the vicinity of stations. When demanded in other places by the features of the ground, the circumstances should be specially represented for orders.

14. Fencing should be estimated for, but it is probable that a change in the law may allow of its being limited, when slow speeds are adopted, to the vicinity of stations and other places where absolutely necessary.

15. The telegraph will be arranged for through, or in communication with, the Government telegraph department, but it should be included in the estimates.

16. Rules as to taking up of land, and as to scales for both preliminary and final location surveys, will shortly be published.

17. The questions of rolling-stock, character of permanent-way, designs of stations and other buildings, provision of workshops, &c. will be considered hereafter, and separate instructions will be issued regarding them. The matter calling for first consideration is the formation of the road, and it is to this that attention should now be mainly given.

26th October 1869.



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