

# ADMINISTRATION REPORT

ON

# RAILWAYS IN INDIA

FOR

1880-81.

BY

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# INTRODUCTION.

Present Report includes Guaranteed Railways as well as State Railways—Revenue Accounts taken as the basis of statistics—Open line reviewed to 31st December 1880—Lines under construction or survey reviewed to 31st March 1881—Synopsis of Report—Territorial classification of Railways adopted—Productive, Protective, and Provincial Railways—Table of Railways in India—Heads of Railway Departments.

THE last Administration Report on Indian Railways\* described the construction and working of the State lines from their commencement to the end of 1879.

\* Administration Report on Indian State Railways, by Major-General J. S. Trevor, B.E., Director General of Railways: Calcutta, 1881.

The present Report takes up the history of these State lines for the year 1880; but in order that the Railways in India may be dealt with as a whole system and not in isolated sections, the Guaranteed Railways as well as State Railways. Lines are also reviewed in this Report.

As in last year's Administration Report, the half-yearly Revenue Accounts have been taken throughout as the basis for all figures. These returns are made

Revenue Accounts taken as the basis of statistics.

up for the calendar year; and although they may not be always strictly correct, after-adjustments having sometimes to be made in subsequent Accounts, they are readily accessible to all Railway Officers, and furnish statistics quite accurate

Open line reviewed to 31st December 1880.

Lines under construction or survey reviewed to 31st March 1881.

enough for all practical purposes. The working of Railways open to traffic is reviewed, therefore, to the 31st December 1880. For lines under construction or survey later information is available; and these are dealt with up to the 31st March 1881.

Chapter I deals generally with Railway subjects. Chapter II gives a précis of the leading events, that have occurred on Railways from the 1st January 1880 to the 31st March 1881.

Synopsis of Report.

These events are alluded to more fully in Chapters III and IV, according as the circumstances relate to lines under construction or to Railways open for traffic. The subjects of the remaining Chapters are explained by the headings.

Statistics and Maps will be found at the end of the Report. Diagrams illustrating the traffic of Railways are placed at the commencement.

For convenience of reference, the Railways have been grouped territorially. Those in the left-hand upper corner of the Map of India are first treated of; then,

Territorial classification of Railways adopted.

working gradually down to the east and south, the others follow in succession. The Guaranteed lines have been classed together in a similar territorial order. The East Indian Railway, having come under the terms of a new contract, is kept separate.

In the course of this Report the terms "Productive," "Protective," and "Provincial" will be found applied to Railway undertakings.

Productive, Protective, and Provincial Railways.

By a "Productive" work is meant, so far as Railways are concerned, an undertaking which can be estimated to pay, "within a maximum limit of five years from the date of the line being opened for traffic, 4 per cent. on the capital invested, including therein all arrears of simple interest incurred up to that date, and also the capitalised value of the land revenue and of leave allowances and pensions." Such a work may be constructed out of borrowed money.

Secretary of State's despatch No. 1 of 1881 (Financial).

By a "Protective" work is to be understood an undertaking not "necessarily directly remunerative, but obviously protective in the sense of guarding against a probable future outlay in the relief of the population." Such a work may not be made out of borrowed money. The capital required for its construction must come out of the revenues of the country.

A "Provincial" work is one that is undertaken by a Local Government which guarantees interest upon all capital advanced, whether that capital has been obtained from the Government of India, from provincial funds, or from local sources.

An interesting table giving the length of all the Railways in India constructed, in progress, and under survey on 1st January 1881, together with the names of the Officers who have served as Heads of Departments on each line during the year 1880, will be found in Appendix A. The list follows the territorial order above alluded to. The same succession will be adhered to throughout this Report, except in the statistical tables at the end of the work, which are classed into broad and narrow gauge.

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# APPENDIX A.

Statement showing the length of all the Railways in India constructed, in progress, and under survey on 1st January 1881, together with the names of the Officers who have served as Heads of Departments on each line during the year 1880.

Gauge.	Railway.	Total length open on 1st January 1881.	Under construction.	Under survey or not yet commenced.	HEADS OF DEPARTMENTS.					Remarks.
					Agent or Manager.	Engineering Department.	Traffic Department.	Locomotive Department.	Audit and Accounts.	
<i>STATE.</i>										
<i>Punjab and Sind.</i>										
4' 0"	Punjab Northern	226 (1)	122 (3)	...	Captain W. Sedgwick.	Captain W. Sedgwick.	C. J. Keene	A. B. Thomson.	Captain J. S. Biscoe.	(1) Lahore to Haji Shah (Attock).
3' 6"	Punjab Northern	54 (2)	...	...	Major E. L. Marryat from November 1880.	Major E. L. Marryat from November 1880.	.....	.....	Captain A. G. Begbie from November 1880.	(2) Lala Musa to Minni. (3) Haji Shah to Peshawar, 60 miles. Turnool to Kusalgarh, 73 miles.
4' 0"	Indus Valley	501	...	...	Captain T. B. E. Savi.	R. T. Mallet J. Ramsay from November 1880.	G. F. Mathew	G. E. Thomas	J. S. Hubbard. E. K. Williams from September 1880.	
4' 0"	Kandahar	152 (4)	41 (5)	257 (6)	.....	H. F. Storey	.....	.....	.....	(4) Buk to Sibi, 133 miles. Sibi to Pir Chanki, 19 miles. (5) Sibi to Spintangi (since discontinued). (6) Spintangi to Kandahar, 230 miles. Branch to Quetta, 18 miles.
4' 0"	Amritsar-Pathankot	...	...	65	.....	.....	.....	.....	.....	
<i>North-Western Provinces Provincial.</i>										
4' 3 1/2"	Muttra-Hathras	20	...	...	C. W. E. Henslowe.	C. W. E. Henslowe.	C. W. E. Henslowe.	W. C. Gibbons.	H. Marten.	
4' 3 1/2"	Muttra-Achmeyra	...	23 1/2	...	.....	.....	.....	.....	.....	
4' 3 1/2"	Cawnpore-Farukhabad.	40 1/2	36 1/2 (7)	102 (8)	C. W. E. Henslowe.	E. L. Hunt C. W. E. Henslowe from February 1880.	C. W. E. Henslowe.	W. C. Gibbons.	H. Marten H. Rainer from December 1880.	(7) Miran Seral to Farukhabad. (8) Extension from Farukhabad to Hathras.
4' 0"	Dildarnagar-Ghazi- pur.	12 (9)	...	...	.....	G. V. Martyn from December 1880.	.....	.....	.....	(9) Worked by East Indian Railway from December 1880.
4' 0"	Bhanpur-Kalpi	...	...	33	.....	G. H. Lidt	.....	.....	.....	
4' 3 1/2"	Bareilly-Pilibhit	...	...	33	.....	G. V. Maslovor	.....	.....	.....	
<i>Bengal Provincial.</i>										
4' 0"	Calcutta and South- Eastern.	28	15 (10)	13 1/2 (11)	R. G. Mookerjee.	Chief Engineer, Bengal.	R. G. Mookerjee.	A. W. Rendell.	F. P. Quinlan	(10) Sonapur to Magra Hat. (11) Magra Hat to Diamond Harbour.
4' 0"	Nalhati	27 1/2	...	...	Ditto	Ditto	Ditto	Ditto	Ditto	
4' 3 1/2"	Northern Bengal	230 1/2	...	73 (13)	Captain W. A. J. Wallace.	Captain W. A. J. Wallace.	G. M. Drury	Ditto	Ditto	(12) Poradaha section worked by Eastern Bengal Railway.
4' 0"			13 (13)	...	...	...	...	...	...	(13) Teesta river to Dhubri, 63 miles. Farhatipur to Dinagepur, 20 miles.
4' 3 1/2"	Tirhoot	82 1/2	102 (15)	65 (16)	V. Rigny	V. Rigny	W. M. Johnston. A. W. N. Pope from May 1880.	.....	.....	(14) Barrh Branch worked by East Indian Railway.
4' 0"			2 1/2 (14)	...	...	...	...	H. M. Carden	J. Douglas	(15) Muzaffarpur to Bettiah, 78 miles. Durbhanga to Pipra Ghat, 2 1/2 miles. (16) Pipra Ghat extension, 30 miles. Muzaffarpur to Hajipur, 36 miles.
4' 0"	Patna-Gya	67	...	80 (17)	Ditto	Ditto	Ditto	Ditto	Ditto	(17) Gya to Palamow.
...	Dacca-Mymensingh	...	...	128	.....	.....	.....	.....	.....	

Statement showing the length of all the Railways in India constructed, in progress, and under survey on 1st January 1881, &c.—continued.

Gauge.	Railway.	Total length open on 1st January 1881.	Under construction.	Under survey or not yet commenced.	HEADS OF DEPARTMENTS.					Remarks.
					Agent or Manager.	Engineering Department.	Traffic Department.	Locomotive Department.	Audit and Accounts.	
STATE—contd.										
Bombay and Central India.										
5' 3 1/2"	Rajputana ...	726 1/2 (18)	...	...	Major W. S. S. Bisset.	B. W. Blood	J. O'Callaghan. F. D. Barclay from March 1880.	F. N. Gatersloh. W. R. S. Jones (Carriage and Wagon).	Lieut.-Col. E. M. Moberly.	(18) Includes Western Rajputana Railway. (19) Agra Fort station to East Indian Railway station.
5' 6"		1 1/2 (19)								
5' 3 1/2"	Holkar and Sindia-Neemuch.	264 1/2	135 1/2 (20)	...	H. Dangerfield. C. H. Croudace from September 1880.	H. Dangerfield. C. H. Croudace from September 1880.	W. E. Hart-	G. M. Davies	J. W. Fordham.	(20) Neemuch to Chittor, 83 miles, since opened in March 1881.
5' 6"	Sindia ...	66 1/2 (21)	9 1/2 (22)	100 (23)	.....	.....	.....	.....	.....	(21) Worked by East Indian Railway. (22) Chambal bridge and approaches opened 15th May 1881. (23) Gwalior to Mandla.
5' 6"	Patri ...	22 1/2 (24)	...	...	.....	.....	.....	.....	.....	(24) Worked by Bombay, Baroda and Central India.
5' 6"	Dhond-Manmad ...	145 1/2 (25)	...	...	Major W. J. Engledue. E. H. Hallum from 6th December 1880.	E. H. Hallum	W. J. Chamberlain.	E. W. M. Hughes.	W. H. Brand	(25) Worked by Great Indian Peninsula Railway from November 1880.
...	Bombay Eastern Deccan (26).	...	...	173 1/2	.....	W. L. Buyers	.....	.....	.....	(26) Provincial.
5' 6"	Barvi Road to Pandharpur.	...	...	33	.....	E. H. Hallum	.....	.....	.....	} Proposed branches from Great Indian Peninsula Railway.
5' 6"	Barvi Road to Barvi	...	...	20 1/2	.....	.....	.....	.....	.....	
5' 3 1/2"	Karwar ...	...	...	264 1/2 (27)	.....	.....	.....	.....	.....	(27) A portion of the earthwork from Bellary to Hospett was carried out as a famine work in 1877.
...	Marmagao-Hubli ...	...	...	124 (28)	.....	W. L. Buyers	.....	.....	.....	(28) Preliminary survey made.
Central Provinces.										
5' 6"	Wardha Coal ...	46 1/2	...	...	J. Y. Davidson.	J. Y. Davidson.	J. W. Hartley	G. B. Reynolds.	F. L. Brown	(29) Nagpur to Tamsar. (30) 50th mile to Durgagarh. (31) Durgagarh to Bilaspur.
3' 3 1/2"	Nagpur-Chhattisgarh.	53 (29)	75 1/2 (30)	135 (31)	Ditto	Ditto	Ditto	J. Y. Davidson.	Ditto ...	
...	...	...	...	...	.....	.....	.....	.....	.....	
Birma Provincial.										
3' 3 1/2"	Bangoon and Irrawaddy Valley.	161	...	42 (32)	H. M. Mathews.	H. M. Mathews.	A. E. Adie	H. T. Ferguson.	S. M. Johnson.	(32) Promet to Allanmye.
3' 3 1/2"	Bangoon and Sittang Valley.	...	...	163 1/2	.....	.....	.....	.....	.....	
Assam.										
...	Dibrugarh-Sadiya	...	...	75	.....	.....	.....	.....	.....	
Native States.										
5' 3 1/2"	Jodhpur ...	...	17 (32a)	43 (32b)	.....	.....	.....	.....	.....	(32a) Kharechi to Pali. (32b) Pali to Jodhpur.
5' 6"	Bhopal ...	...	62 (33)	104 (34)	.....	H. T. Geoghegan.	.....	.....	.....	(33) Itarsi to Bhopal. (34) Bhopal towards Jhanai.
3' 3 1/2"	Bhavnagar-Gondal (35).	105	67 1/2 (36)	...	.....	A. Isat	.....	J. Rhind	J. B. Braddon	(35) From Bhavnagar to Wadhwan and Dhoraji. (36) Dhola to Dhoraji opened 19th January 1881.
5' 6"	Osekwar of Baroda (37).	56 1/2	2	...	.....	.....	.....	.....	.....	(37) Constructed and worked by Bombay, Baroda and Central India Railway.
5' 6"	} Recre branches {	Khamgaon	3	} (38)	.....	.....	.....	.....	.....	(38) Worked by Great Indian Peninsula Railway.
5' 6"		Amraoti	6							



Statement showing the length of all the Railways in India constructed, in progress, and under survey on 1st January 1881, &c.—continued.

Gauge.	Railway.	Total length open on 1st January 1881.	Under construction.	Under survey or not yet commenced.	HEADS OF DEPARTMENTS.					Remarks.
					Agent or Manager.	Engineering Department.	Traffic Department.	Locomotive Department.	Audit and Accounts.	
	STATE—conold.									
	Natives States—conold.									
8' 6"	Nizam's ...	121	...	...	Lieut. F. T. Maxwell.	Lieut. F. T. Maxwell.	W. Sandford	E. W. M. Hughes.	F. Morrison.	
3' 3 1/2"	Mysore ...	8 (39)	85 1/2 (40)	...	.....	Major A. Le Mesurier.	.....	.....	.....	(39) Bangalore cantonment to Bangalore city worked by Madras Railway Company. (40) 88 miles since opened to Mandya.
8' 6"										
	GUARANTEED COMPANIES.									
8' 6"	Sind, Punjab and Delhi. Sind Section.	553 1/2	...	...	E. Bocquet	C. Stone (41)	D. Ross	G. Sandford	J. Lightfoot	(41) Officiating from 1st January 1880 to 7th June 1880.
8' 6"	Eastern Bengal ...	159 1/2	...	...	F. Prestage...	W. Nicholson	T. Brander ...	T. Hindmarsh	G. L. Calder.	(42) Officiating from 8th June 1880 to 31st December 1880.
8' 6"	Bombay, Baroda and Central India.	421 1/2	...	...	F. Mathew ...	F. Mathew ...	J. B. Duxbury.	E. B. Carroll	J. O'Connell. N. Morhouse acting.	
8' 6"	Great Indian Peninsula.	1,288	...	...	G. A. Barnett	Wilson Bell	H. Conder ...	S. Jackson ...	E. V. Jordan.	
8' 6"	Madras ...	690 1/2	...	...	A. M. Saunders.	W. B. Robinson.	H. E. Church	F. H. Treithick.	F. Church.	
8' 3 1/2"	South Indian ...	658 1/2	...	...	W. S. Betts...	D. Logan ...	A. Stanton ...	E. G. Sheward. J. M. Budgo acting.	J. Smith.	
8' 6"	EAST INDIAN	1,504 1/2	6 1/2 (46)	...	Bradford Leslie.	Bradford Leslie.	N. St. L. Carter.	D. W. Campbell. E. Pearce, Carriage Superintendent.	E. C. S. Mackenzie.	New contract between the Secretary of State and the Company came into force on 1st January 1880. (46) Bhadreswar Branch, 2 1/2 miles. Hooghly Bridge Branch, 4 miles.
	SUBSIDISED COMPANY.									
8' 6"	Bengal Central ...	...	...	2 1/2	.....	.....	.....	.....	.....	Section from Ranaghat to Jessore and Kurnas, 82 1/2 miles, and from Bongong to Calcutta, 47 miles, have been undertaken by the Bengal Central Railway Company. Work was commenced on 12th May 1881.
	Total for East Indian and Guaranteed Railways ...	8,096 1/2	12							

### GOVERNMENT ADMINISTRATION.

The following Officers of Government were more or less directly connected with the administration of the several Railways:—

Colonel The Hon'ble Sir Andrew Clarke,  
K.C.M.G., C.B., C.I.E., R.E.

The Hon'ble J. Gibbs, C.S.I., C.I.E., C.S.  
(from 9th June 1880).

Major-General Alexander Fraser, C.B., R.E.

Major-General J. S. Trevor, C.S.I., R.E. ...

G. L. Molesworth, C.I.E., M. INST. C.E. ...

Colonel W. S. Trevor, V.C., R.E. ...

Member of the Governor General's Council in charge of Public Works Department.

Secretary to Government of India. Officiated as Hon'ble Member of Council from 2nd March 1880 to 9th June 1880.

Director General of Railways and Deputy Secretary to the Government of India. Officiated as Secretary to Government from 2nd March 1880 to 9th June 1880.

Consulting Engineer to Government of India for State Railways. Officiated as Deputy Secretary from 2nd March 1880 to 9th June 1880.

Attached to Office of Director General of Railways. Since appointed Director General of Railways.

Colonel L. Russell, R.E.	...	Chief Engineer and Joint Secretary to Government of North-Western Provinces and Oudh.
Colonel J. O. Mayne, R.E.	...	Chief Engineer and Secretary, Central Provinces.
Colonel W. S. Trevor, V.C., R.E.	...	Chief Engineer and Secretary, Burma.
W. C. Furnivall, M. INST. C. E. (from 28th October 1880).	...	
Colonel F. S. Stanton, R.E.	...	Director of State Railways in Bengal and Secretary to Government of Bengal.
Lieutenant-Colonel R. C. B. Pemberton, R.E.	}	Director of Stores.
R. T. Mallet, M. INST. C. E. (October 1880)		
Major A. J. Filgate, R.E.	...	Officiating Accountant General and Officiating Deputy Secretary to Government of India.
Captain F. Firebrace, R.E.	...	Under Secretary to Government of India, Railway Branch.
Colonel J. Shaw-Stewart, R.E.	...	Consulting Engineer for Railways and Joint Secretary to Government, Madras.
Colonel H. F. Hancock, R.E.	...	Consulting Engineer for Railways and Joint Secretary to Government, Bombay.
Major G. W. Oldham, R.E. (officiated during Colonel Hancock's absence).		Deputy Consulting Engineer for Railways and Under Secretary to Government, Bombay.
Colonel F. S. Taylor, R.E.	...	Consulting Engineer to Government of India for Guaranteed Railways, Calcutta.
Lieutenant-Colonel R. deBourbel, R.E. (from September 1880).	...	
Colonel J. G. Medley, R.E.	...	Consulting Engineer to Government of India for Guaranteed Railways, Lahore.
Lieutenant-Colonel R. C. B. Pemberton, R.E.		Consulting Engineer to Government of India for Guaranteed Railways, Lucknow.

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## APPENDIX B.

Contract between the Secretary of State in Council and the East Indian Railway Company as to the maintenance, management, and working of the undertaking by the East Indian Railway Company, dated 22nd December 1879.

This Indenture made the 22nd day of December 1879 between the Secretary of State in Council of India of the one part and the East Indian Railway Company incorporated by an Act of Parliament passed in the session of the 12th and 13th years of the reign of Her present Majesty intituled "an Act for incorporating the East Indian Railway Company and for other purposes connected therewith" of the other part.

Preamble.

Whereas by the East Indian Railway Company Purchase Act 1879 hereinafter called the "Act of 1879" the parties hereto are authorized and empowered to enter into contracts for the purposes hereinafter expressed.

Now this Indenture witnesseth and it is hereby agreed and declared as follows—

### *Interpretation of terms.*

1. In this contract—

the expression "the Secretary of State" means the Secretary of State in Council of India—  
"Secretary of State,"

"the Company,"

the expression "the Company" means the East Indian Railway Company—

the expression "the East Indian Railway" means the Railways and works of whatever description forming the undertaking of the Company on the 31st of December 1879—  
"the East Indian Railway,"

the expression "the undertaking" means the East Indian Railway or such part thereof as shall on the 1st of January 1880 be handed over to the Company for the purposes of this  
"the undertaking."

contract together with any improvements, alterations and additions of whatever description that may from time to time be made therein or thereto by or with the sanction of the Secretary of State.

### *Duration of Contract.*

2. This contract shall continue in force for the period of fifty years from the 1st of January 1880 subject to the provisions hereinafter contained for determining the same.  
Duration of contract.

### *As to deferring one-fifth of the Annuity.*

3. During the continuance of this contract the payment of one-fifth of the annuity of £1,473,750 mentioned in the Act of 1879 shall be deferred and in lieu thereof interest at the rate of £4 per cent. per annum on the sum of £6,550,000 being the capital sum represented by such one-fifth shall be paid by the Secretary of State to the Company in London by half-yearly payments on the 1st of January and the 1st of July in every year the first of such payments to be made on the 1st of July 1880 in respect of the half-year immediately preceding that date.  
Annuity deferred.  
Interest on deferred annuity.

### *As to the Undertaking to be transferred to the Company and matters connected therewith.*

4. On the 1st of January 1880 the Secretary of State shall hand over to the Company for the purposes of this contract the East Indian Railway together with the rolling stock plant and machinery belonging thereto subject to the following exceptions—  
Railway &c. to be handed over.

(1) The land occupied by the Company in the Sulkeah yard at Howrah now or lately used for the storage of State Railway material which land shall nevertheless be handed over to the Company if and so soon as the Secretary of State shall obtain the use of other sufficient land for the storage of such material.  
Land in Sulkeah yard.

- (2) The telegraphs and all telegraphic appliances belonging to the East Indian Railway which shall remain vested in the Secretary of State subject as hereinafter provided.  
Telegraph to remain State property.
5. On the 1st of January 1880 or so soon thereafter as may be the Secretary of State shall deliver to the Company and the Company shall accept for the purposes of the undertaking all stores belonging to the East Indian Railway that may be in hand or in course of delivery on the first of January 1880 except such as on the representation of the Company to be made in writing on or before the 31st day of December 1879 the Secretary of State may adjudge to be unserviceable or surplus stores.  
Stores to be handed over.
6. During the continuance of this contract the Secretary of State shall provide and allow the Company to use such telegraphs and telegraphic appliances as the Company shall with the sanction of the Secretary of State from time to time require for the purposes of the undertaking and shall maintain the said telegraphs and telegraphic appliances in good repair and good working condition. The working of the said telegraphs shall be exclusively in the hands of the Company but the Company if so directed by the Secretary of State shall observe the rules for the time being in force in the case of State Railway telegraphs or such of the said rules as the Secretary of State may from time to time prescribe for their observance and the Company shall furnish the Secretary of State with such free passes as he may require for persons employed by him in or about the erection maintenance or inspection of the said telegraphs and telegraphic appliances or otherwise in connection therewith.  
Use and maintenance of telegraph.
7. A separate agreement shall be made between the Secretary of State and the Company as to the working of the Serampore and Kurhurballie coal fields which are intended to be part of the undertaking. Provided nevertheless that the rent payable to Government in respect of the said coalfields shall not exceed the aggregates of the fixed rents now payable in respect of the same.  
Collieries.
8. If the Branch Railway from the Mogul Seraj station on the main line of the East Indian Railway to the river Ganges opposite Benares shall be part of the undertaking handed over to the Company on the 1st of January 1880 the Secretary of State may at any time require the Company to retransfer such branch railway to him and the Company shall not claim any compensation in respect of such retransfer.  
Benares Branch.
9. As soon as may be after the 1st of January 1880 an inventory of the undertaking and an inventory and valuation of the rolling stock plant and machinery belonging thereto as on the 1st of January 1880 shall be made and signed by or on behalf of the Secretary of State and the Company the valuation being based on the sums outstanding on that day in the capital account of the Company.  
Inventory and valuation of undertaking.

*As to the Maintenance and Management of the Undertaking.*

10. The Company shall keep the undertaking in good repair in good working condition and fully supplied with rolling stock plant and machinery to the satisfaction of the Secretary of State. If the Company shall fail for the space of one calendar month to comply with any requirement in writing of the Secretary of State in regard to the matters aforesaid or any of them the Secretary of State may enter on the undertaking and execute all such works and provide all such rolling stock plant and machinery as may in his opinion be required for the purposes of the undertaking.  
To keep undertaking in good working condition.  
In case of non-compliance Secretary of State may enter and execute works.
11. The Company shall keep the rolling stock plant and machinery belonging to the undertaking in good repair and in good working condition to the satisfaction of the Secretary of State.  
Rolling stock and machinery.
12. The Company shall maintain a sufficient staff for the purposes of the undertaking to the satisfaction of the Secretary of State.  
Sufficient staff to be maintained.
13. The Secretary of State may from time to time by notice in writing require the Company to carry out any alteration or improvement in the undertaking or any addition thereto that  
Alteration or improvement.

may in his opinion be necessary for the safety of passengers or for the safety of the public or for the effectual working of the undertaking. Such notice shall specify the alteration improvement or addition required and shall also in general terms describe the works to be executed for the purpose of carrying out such alteration improvement or addition. On receiving any such notice the Company shall with all reasonable speed commence and proceed to execute the

works described therein the Secretary of State supplying the necessary funds and providing any land that may be required for the purpose. If in any case the Company shall neglect to proceed with the proposed works or fail to complete the same to the satisfaction of the Secretary of State the Secretary of State may enter on the undertaking and execute the said works.

14. The Secretary of State shall provide and maintain for the purposes of the undertaking such a force of police as the Company with the approval of the Secretary of State shall from time to time require with this qualification that in case of difference between the Secretary of State and the Company as to the force required for the preservation of law and order the determination of the question shall rest with the Secretary of State. The cost of providing and maintaining the force of police required for the purposes of the undertaking shall be defrayed in the following manner that is to say three-tenths shall be borne by the Secretary of State and the remaining seven-tenths shall be treated as part of the working expenses of the undertaking.

*As to the Use and Working of the Undertaking and the Conveyance of Traffic.*

15. The Company shall cause to be run so many trains at such times at such rates of speed between such places and with such conveniences and accommodations as the Secretary of State shall from time to time require.

16. The Company shall charge such rates and fares for the carriage of goods and passengers as may from time to time be fixed by the State Provided that the Secretary of State may require the charges for the conveyance of any mineral or mineral substance or any article of agricultural produce over distances not less than 300 miles to be reduced to any rate not below one-sixth of a pie per maund per mile for full wagon loads and may also require the fare of passengers conveyed in closed carriages with seats to be reduced to any rate not below two pies per mile.

17. The Secretary of State may from time to time require the Company to carry out any alteration or improvement in the working of the undertaking that may in his opinion be necessary for the safety of passengers or for the safety of the public or for the effectual working of the undertaking.

18. All services which the Secretary of State may require the Company to perform for the Post Office the Military Department the Police Department or any other Department of the State or for high Government officials (including in such services the conveyance of mails as defined by the Post Office Act or Acts for the time being in force in India the conveyance of Post Office servants when on duty the conveyance of troops and sailors military and naval establishments horses and other animals used for military purposes guns military stores and equipments the conveyance of police prisoners and paupers the conveyance of telegraph stores instruments officers and workmen and of any public stores whatever) shall be performed by the Company on the same general conditions as may for the time being be in force on State Railways and at such rates as may be approved by the Secretary of State not being less than the highest rates in force for the time being for similar services on State Railways of the same gauge.

19. The Company shall convey gold and silver bullion and coin and copper coin belonging to the Government of India and the persons in charge thereof at special rates to be from time to time approved by the Secretary of State.

20. The Company shall from time to time upon the requisition of the Secretary of State give precedence to the demands of the Government whether for freight or passenger accommodation over all ordinary traffic.

21. All stores intended to be used for the purposes of the undertaking shall be conveyed by the Company at rates to be approved by the Secretary of State not being less than the actual cost of conveyance.

*As to Receipts Payments and Expenditure.*

22. All monies which shall be received by or on account of the Company in India in respect of the undertaking or from the working of the telegraphs and telegraphic appliances provided for the Company under this contract shall at such times and in such manner as the Secretary of State may from time to time direct be paid without deduction into the Treasury of the Government of India at Calcutta to a separate account.

23. All monies required by the Company for the purposes of the undertaking shall be supplied to the Company by the Secretary of State according to such arrangements as shall from time to time be made between the Secretary of State and the Company.

24. All monies expended by the Company on account of the undertaking and all other expenses of the Company in connection therewith shall from time to time be stated and submitted to the Secretary of State for his sanction and as between the Company and the Secretary of State shall be allowed only so far as the same shall from time to time have been sanctioned by the Secretary of State.

*As to Accounts.*

25. The Company shall keep all such accounts relating to the undertaking and all such accounts as between the Company and the Secretary of State as the Secretary of State shall from time to time require. Such accounts shall be kept in such form and under such heads or divisions and with such details as the Secretary of State shall from time to time prescribe. The said accounts so far as the same are kept in India shall be kept in rupees of the Government of India and so far as they are kept in England shall be kept in sterling money. Such of the said accounts as are kept in England shall from time to time be transmitted by the Secretary of State to the Government of India at Calcutta and there incorporated in the accounts of the Company in India each account for the purpose of such incorporation being converted into rupees at the rate fixed for the adjustment of financial transactions between the Government of the United Kingdom and the Government of India and in use on the day to which such account shall have been made up.

26. Unless and until otherwise directed the Company shall keep the following accounts—

Accounts to be kept.

A Revenue Account.  
A Capital Advance Account.  
A Capital Account.  
A Stores Account.

27. The Revenue Account shall contain an account of all receipts and payments on account of revenue, and shall be made up half-yearly to the 30th of June and the 31st of December in each year or to such other days as the Secretary of State shall from time to time prescribe. The Revenue Account shall be regularly submitted by the Company to the Secretary of State who may audit the same concurrently with or after expenditure or in both ways as he may think fit and may in case of any error being discovered therein correct the same within three calendar months after the account containing such error shall have been submitted to him. Every Revenue Account shall be considered as settled at the expiration of three calendar months after the same shall have been submitted to the Secretary of State but nevertheless any error which may subsequently be discovered therein shall be corrected in the next Revenue Account or in any subsequent Revenue Account or Accounts as the Secretary of State may determine.

28. All monies advanced by the Secretary of State for the purpose of carrying out works chargeable to capital or for the purchase of stores or for the payment off of debentures or debenture stock of the Company shall be entered in the Capital Advance Account and interest at the rate of 4½ per cent. per annum or such other rate as shall from time to time be agreed upon by the Secretary of State and the Company shall from time to time be payable to the Secretary of State on the balance of such account not passed to the Capital Account or to the Stores Account.

29. All monies which the Secretary of State shall pay to the Company in respect of the interest of the Company in the value of the buildings workshops fixtures machinery and plant on the said Kurhurballie and Serampore coalfields and all monies which shall be actually expended

by the Company or by the Secretary of State upon works rolling stock plant or machinery the cost of which is chargeable to capital and the value of all land provided by the Secretary of State after the 1st of January 1880 for the purposes of the undertaking shall be entered in the Capital Account which shall be made up and stated afresh as often as occasion shall require. Interest at the rate of  $4\frac{1}{2}$  per cent. per annum or such other rate as shall from time to time be agreed upon by the Secretary of State and the Company shall from time to time be payable to the Secretary of State on the balance from time to time standing at the debit of the Capital Account.

30. The Company shall on or before the 30th of June 1880 make up and deliver to the Secretary of State an account of all stores delivered to the Company as on the 1st of January 1880 and of the value of such stores the value being taken as entered in the books of the Company on the 31st of December 1879 except in those cases if any in which a different value shall be agreed upon by the Secretary of State and the Company. As soon as possible after the 30th of June and the 31st of December in each year or such other half-yearly days as the Secretary of State may from time to time prescribe for the making up of the Revenue Account the Company shall make up and deliver to the Secretary of State an account of all stores in hand on the half-yearly day immediately preceding the making up of the account and of all stores used by the Company for the purposes of the undertaking since the 1st of January 1880 or since the date to which the Stores Account was last made up as the case may be showing the purposes for which such stores have been used. As often as any of the stores in hand shall be used by the Company for the purposes of the undertaking the value of the stores so used as entered in the books of the Company shall be charged to the Revenue Account or to the Capital Account as the case may require in accordance with the provisions in that behalf herein contained. Interest at the rate of  $4\frac{1}{2}$  per cent. per annum or such other rate as shall from time to time be agreed upon by the Secretary of State and the Company shall from time to time be payable to the Secretary of State on the value of stores in hand.

31. The stores in hand shall from time to time be revalued at such time or times as the Secretary of State shall direct and in such manner as shall from time to time be agreed upon by the Secretary of State and the Company and the value of the stores in hand as entered in the books of the Company shall be corrected in accordance with such revaluation. Any deterioration or loss that may be ascertained or discovered upon any revaluation shall be charged to Revenue Account.

32. The question whether any expenditure incurred for the purposes of the undertaking is to be treated in the whole or in part as a charge incurred on Capital Account or how the same is to be dealt with shall be determined on the general principle that capital is to bear the cost of new works of additional rolling stock plant and machinery and of substantial improvements of and additions to old works rolling stock plant and machinery including the cost of any temporary new work the construction of which is requisite for the construction of a work properly chargeable to Capital and that the cost of repairs restorations renewals replacements or substitutions is to be borne by Revenue. Provided nevertheless that any item of expenditure properly chargeable to Capital in accordance with this principle but not exceeding 2,000 rupees may at the discretion of the Secretary of State be charged to Revenue but so that the aggregate expenditure charged to Revenue on account of such items shall not exceed 25,000 rupees in any half-year and provided also that except with the sanction of the Secretary of State no portion of the salaries or allowances of any of the Company's permanent supervising staff shall be chargeable to Capital although for the time being employed partly or wholly in directing or superintending work so chargeable and that no expenses connected with the engagement or passage from or to England of any person in the Company's service shall be chargeable to Capital unless such person shall have been specially engaged to carry out work chargeable to Capital and actually employed upon such work.

33. If any difference shall arise between the Secretary of State and the Company as to the incidence of expenditure between Capital and Revenue in any particular case the matter in difference shall be referred to the decision of the Joint Auditor if the Secretary of State and the Company shall have appointed such an officer but in case a Joint Auditor shall not have been appointed then the matter in difference shall be referred for final decision to the Company's Auditor or some other person to be named by the Company and a Government Examiner of Railway Accounts or some other person to be named by the Secretary of State or in case of their being unable to agree to a referee to be



named by them. The costs of any such reference shall unless the Secretary of State shall otherwise direct be treated as part of the working expenses of the undertaking.

*As to the Working Expenses and the application of the Receipts of the Undertaking.*

34. The working expenses of the undertaking shall be paid out of the gross receipts of the undertaking (including in such receipts all monies received by the Company for the use and working of the telegraphs and telegraphic appliances provided for the Company under this contract) and shall so far as possible be borne by the gross receipts of the half-year to which such working expenses are properly attributable.

35. Working expenses shall include all costs and expenses incurred by the Company with the sanction of the Secretary of State in or about the maintenance management and working of the undertaking and all other sums if any proper to be allowed out of Revenue in connection with the maintenance management or working of the undertaking or in connection with the conduct of the affairs of the Company and which shall be sanctioned by the Secretary of State.

In the working expenses of the undertaking there shall be reckoned —

- (1) Such sum or sums of money as shall from time to time be agreed upon between the Secretary of State and the Company as proper to be allowed in respect of the rent of the Company's Office in London office expenses Director's fees and salaries of clerks and servants.
  - (2) So much of the cost of providing and maintaining a police force for the purposes of the undertaking as is not hereby agreed to be borne by the Secretary of State.
  - (3) All expenditure incurred by the Company with the sanction of the Secretary of State or by the Secretary of State in keeping the undertaking in good repair and in good working condition and fully supplied with rolling stock plant and machinery except such part if any of such expenditure as may be charged to Capital.
  - (4) All expenditure incurred by the Company with the sanction of the Secretary of State in keeping the rolling stock plant and machinery belonging to the undertaking in good repair and in good working condition.
  - (5) All expenditure incurred by the Company with the sanction of the Secretary of State or by the Secretary of State in the execution of any works chargeable to Revenue.
  - (6) Such a sum not exceeding Rs. 50,000 in any half-year as may be required by the Secretary of State to cover the costs and charges of and incidental to the supervision and control of the Company by the Secretary of State.
  - (7) The charges of the Government Telegraph Department for rent maintenance and inspection of the telegraphs and telegraphic appliances provided for the use of the Company.
  - (8) All such other expenses as the Secretary of State and the Company agree to treat as part of the working expenses of the undertaking.
36. The receipts of the undertaking in each half-year after deducting working expenses and all other charges to Revenue Account properly attributable to that half-year shall be applied in the following manner and in the following order:—
- (1) In payment of interest upon the debenture stock of the Company in existence on the 1st of January 1880 and upon the debentures of the Company outstanding on that day.
  - (2) In payment to the Secretary of State of so much of the annuity of £1,473,750 as is not deferred under this contract.
  - (3) In payment to the Secretary of State of interest at the rate of 4 per cent. per annum on the capital sum represented by the portion of the annuity deferred under this contract.
  - (4) In payment of interest payable to the Secretary of State on money standing to the debit of the Capital Advance Account and the Capital Account.
  - (5) In payment of interest payable to the Secretary of State on the value of stores in hand.



(6) In payment of such sum as shall from time to time be payable to the Provident Institution in connection with the undertaking.

(7) And the surplus if any shall be applied in manner following that is to say four-fifths thereof shall belong to the Secretary of State on behalf of the Government of India and one-fifth thereof shall belong to the Company and shall as soon as ascertained be forthwith paid over to the Company at Calcutta for distribution among the persons entitled thereto under the Act of 1879.

If in any half-year the net receipts of the undertaking shall not be sufficient to answer the purposes coming before the division of the surplus the deficiency with interest at the rate of 4½ per cent. per annum shall be a charge upon the surplus net receipts of subsequent half-years and may be retained by the Secretary of State out of the surplus net receipts of any subsequent half-year before division of profits between the Secretary of State and the Company.

*As to Running Powers and other Facilities and Accommodation for other Railway Companies and State Railways and the Secretary of State.*

37. The Secretary of State may from time to time require the Company to allow the use of the railways forming part of the undertaking for the passage of engines and trains belonging to other Railway Companies or to State Railways upon the payment of reasonable tolls and under reasonable conditions and restrictions.

38. The Secretary of State may from time to time require the Company to supply other Railway Companies or State Railways with any of the rolling stock of the undertaking which shall not for the time being be required for the purposes thereof upon reasonable terms and conditions.

39. The Secretary of State may from time to time require the Company to execute work in their workshops in respect of rolling stock and machinery belonging to State Railways at such reasonable prices and upon such terms as shall be agreed upon between the Secretary of State and the Company but so nevertheless as not to impede or unduly interfere with the ordinary operations of the Company as carried on therein.

40. The Secretary of State may from time to time require the Company to land at Howrah or Calcutta railway stores belonging to the Secretary of State. The Company shall be paid for such services at such reasonable rates as shall from time to time be provided by the Secretary of State.

41. The Secretary of State may from time to time require the Company to make reasonable arrangements for the interchange of traffic and rolling stock with railways belonging to other Companies or to the State.

42. The Secretary of State may from time to time require the Company to allow the use of any of the stations forming part of the undertaking for the accommodation of the traffic of any other Railway Company or State Railway upon the payment of reasonable tolls and under reasonable conditions and restrictions and may also require the Company to make such alterations and additions as may in the opinion of the Secretary of State be necessary or convenient for the purposes of such accommodation upon such terms as may be agreed upon between the Secretary of State and the Company.

43. The Secretary of State may at any time require the Company to make such alterations and additions in or to the sections of the railways comprised in the undertaking situate respectively between the following points that is to say between Delhi and Ghaziabad and between Agra and Toondla as will admit of metre gauge stock of the Rajputana State Railway running upon such sections respectively upon such terms as may be agreed upon between the Secretary of State and the Company.

44. If the Chairman or Deputy Chairman of the Board of Directors of the Company shall certify to the Secretary of State by writing under his hand that he considers any requirement by the Secretary of State purporting to be made under this part of the contract not to be reasonable upon any ground to be stated by him in writing and if there shall then be a difference of opinion between the Secretary of State and the Company as to the reasonableness of

the requirement in question or as to the propriety of any modification or alteration therein the matter in difference shall be referred for decision to an officer of the Government to be named by the Secretary of State and to an officer of the Company to be named by them or if such officers are unable to agree then to some person to be appointed by them.

If the matter in difference shall be determined adversely to the Secretary of State or if any modification or alteration in the requirement of the Secretary of State shall be recommended or in any event if the Secretary of State shall so direct the costs of the reference shall be treated as part of the working expenses of the undertaking.

*As to the Construction and Working of Auxiliary or Branch Railways.*

45. The Secretary of State may require the Company to construct any auxiliary or branch railway of the same gauge in connection with any railway forming part of the undertaking and to work any auxiliary or branch railway of the same gauge in connection with any railway forming part of the undertaking whether constructed by the Company or not either as agents of the Secretary of State or as part of the undertaking, as the Secretary of State may determine upon such terms and conditions as may in each case be agreed upon between the Secretary of State and the Company.

*The Company to comply with the requirements of the Secretary of State.*

46. The Company shall with all reasonable speed comply with all such requirements as the Secretary of State shall from time to time make in accordance with this contract.

*As to the Supervision and Control of the Secretary of State and the Appointment of a Government Director.*

47. In all matters relating to the undertaking and not herein specially provided for the Company shall be subject to the supervision and control of the Secretary of State.

48. For the purpose of inspecting the undertaking and auditing the accounts of the Company or otherwise exercising such supervision and control as are intended to be reserved to the Secretary of State by the contract the Secretary of State may from time to time appoint such person or persons as he may think proper with such powers as he may consider necessary or expedient and the Company shall afford every person so appointed all reasonable facilities for the purpose of enabling him to perform the duties entrusted to him by the Secretary of State.

49. The Company shall record and keep in proper books full and particular accounts of all their transactions and proceedings including full and true minutes of all their meetings meetings of Directors communications with India and correspondence so as at all times to exhibit fully and truly the state of their affairs and the Secretary of State or any person or persons appointed by him in that behalf shall at all reasonable times have free access to all the books accounts papers and documents of the Company relating to the undertaking with power to call for or make copies of or extracts from the same.

50. The Secretary of State may from time to time appoint any one person to be a Director of the Company. The Government Director shall be *ex officio* a member of all Committees appointed by the Board of Directors of the Company or by the Company in relation to the undertaking or any matter connected therewith and he may moreover exercise at his discretion an absolute right of veto in all proceedings whatever at the Board of Directors. The Government Director shall not be removable except by the Secretary of State. The Secretary of State may from time to time, as often as occasion shall require appoint a person to represent the Government Director at any meeting of the Board or at any Committee meeting at which the Government Director may not be present and the person so appointed shall have all such rights, and may exercise all such powers as the Government Director if present would have had or might have exercised.

*Miscellaneous Provisions.*

51. The Company shall not during the continuance of this contract without the sanction of the Secretary of State in writing first obtained engage in or carry on any business other than the business which is the subject of this contract.

52. The Company shall not during the continuance of this contract without the sanction of the Secretary of State in writing first obtained acquire any property in India. If the Company shall in contravention of this clause acquire any property such property shall not be disposed of by the Company without the sanction in writing of the Secretary of State and the Secretary of State may at any time during the continuance of this contract or within one calendar month after the determination thereof purchase such property from the Company at the price actually paid by the Company for the same and if the purchase money for such property shall be paid to the Company during the continuance of the contract the expenditure shall be carried to Capital Account.

53. If in the opinion of the Secretary of State any land in the possession of the Company is not required for the purposes of the undertaking the Secretary of State shall certify such opinion to the Company. Upon receipt of such certificate or so soon thereafter as may be the Company shall state in writing whether they acquiesce in the opinion of the Secretary of State or whether they object thereto and if so the grounds of their objection. If no objection is stated by the Company or if the grounds of their objection if any are not in the opinion of the Secretary of State sufficient the land in question shall upon the requisition of the Secretary of State be restored to him and thereupon the value of such land if entered in the Capital Account shall be written off such account.

54. The Company shall from time to time make such returns and furnish such statistics in such form and under such heads and divisions and with such details as the Secretary of State may from time to time require. The costs of preparing such returns and statistics and incidental thereto shall be treated as part of the working expenses of the undertaking.

55. The Secretary of State shall promote the passing by the Legislature in India of any Act or Acts which may be required to enable the Company to carry into effect this contract.

56. No claim shall be made upon the Secretary of State by the Company for compensation in respect of any Act of the Indian Legislature of general applicability which may prejudicially affect the undertaking or the profits thereof.

57. The Company may if they think it expedient and shall if required by the Secretary of State maintain and manage a Provident Institution and a Savings Bank for the benefit of the servants of the Company upon such terms and under such rules and regulations as shall from time to time be approved by the Secretary of State.

58. Any notice direction appointment certificate of opinion approval or sanction to be given or signified on the part of the Secretary of State for any of the purposes of this contract shall be sufficient and binding if in writing signed by the Secretary of State or one of his Under-Secretaries or by a Secretary of Government at Calcutta or by any other officer or servant duly authorized to act on behalf of the Secretary of State in respect of the matters to which the same shall relate and the Secretary of State shall not in any case be bound in respect of the matters aforesaid unless by some writing signed in the manner before mentioned.

59. The Company shall at all times during the continuance of this contract keep an office established at Calcutta and shall keep at the said office an authorized Agent or Committee of Agency with whom the Secretary of State and the Government of India or other officer or officers deputed in that behalf may communicate on affairs concerning the undertaking and all drafts drawn and receipts given by the said Agent or Committee of Agency or under his or their authority on behalf of the Company concerning the undertaking and the affairs thereof shall be binding on the Company and every notice to be given to the Company (save any notice with respect to the determination of this contract as hereinafter provided) shall be sufficiently given if left at the said office or personally served on the said Agent or any member of the said Committee of Agency.

*As to the Determination of the Contract.*

60. The Secretary of State or the Company may determine this Contract at the end of the 20th or at the end of any succeeding 5th year (computed from the 1st of January 1881) of the said term of fifty years on giving two clear years' notice in writing to the other party hereto of his or their intention so to do and thereupon on the 31st day of December on which the

aforesaid notice shall expire the Company shall give the Secretary of State possession of the undertaking together with the rolling stock plant and machinery belonging thereto and all stores in hand or in course of delivery on that day and all plans books surveys sections printings writings and documents whatsoever in anywise connected with the undertaking and all other property if any belonging or appertaining thereto. And the Secretary of State shall be bound to indemnify the Company their property and effects against all such debts and liabilities if any as they may have incurred with the sanction of the Secretary of State and which shall be then subsisting and thereupon this Contract shall determine without prejudice to the rights of either party against the other in respect of any covenant herein contained which may have been previously broken.

*Arbitration.*

61. If the Secretary of State and the Company shall fail to agree touching any matter with respect to which their agreement is required by this contract or if in any case not herein specially provided for any dispute question or controversy shall at any time arise between the Secretary of State and the Company touching these presents or any clause or thing therein contained or the construction hereof or any matter connected with these presents or the operation hereof or the rights duties or liabilities of either party in relation to the premises then and in every such case the matter as to which the Secretary of State and the Company shall fail to agree or the matter in difference as the case may be shall be referred to two arbitrators or their umpire pursuant to and so as with regard to the mode and consequences of the references and in all other respects to conform to the provisions in that behalf contained in the Common Law Procedure Act 1854 or any subsisting statutory modification thereof and upon every such reference the arbitrators and umpire shall respectively have power to examine witnesses upon oath or affirmation and either to fix settle and determine the amount of costs of the reference and award respectively or incidental thereto to be paid by both parties or by either party or to direct the same to be taxed either as between solicitor and client or otherwise and to direct and award where and by and to whom such costs shall be paid and every or any such reference may be made a rule of Her Majesty's High Court of Justice or of the High Court of Judicature at Fort William in Bengal on the application of the Secretary of State or of the Company and either the Secretary of State or the Company may instruct Counsel to consent thereto for the other party.

In Witness whereof Sir Barrow Helbert Ellis Knight Commander of the Most Exalted Order of the Star of India and Sir Frederick James Halliday Knight Commander of the Most Honorable Order of the Bath being two Members of Council of India have hereunto set their hands and seals and the said Railway Company have hereunto caused their Common Seal to be affixed the day and year first above written.

*Signed sealed and delivered by the above named Sir Barrow Helbert Ellis and Sir Frederick James Halliday being two Members of the Council of India in the presence of*

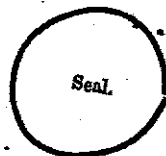
ROBERT WICKENDEN  
*Clerk to the Legal Adviser  
India Office.*

*The Common Seal of the East Indian Railway Company was hereunto affixed in the presence of*

R. M. STEPHENSON.  
T. D. FORSYTH.

B. H. ELLIS.

FRED. JAS. HALLIDAY.



## APPENDIX D.

### RAILWAY CONFERENCE.

The following extracts from the recorded proceedings and from Government Resolutions passed in connection with the objects of the Railway Conferences of 1879 and 1880 give detailed information of the business that was transacted by the two Conferences:—

*Proceedings of the Railway Conference held at Calcutta in February 1879.*

OBSERVATIONS.—The Conference of Railway Delegates assembled at Calcutta on the 10th February in accordance with Government of India Resolution Nos. 375-99, dated 20th January 1879, and held six meetings.

2. The primary object of the Conference was to lay down rules for the interchange of rolling stock between all connected railways.

Twenty-two rules were framed and passed, and a Resolution was recorded to the effect that these rules, with approval of the several Boards of Directors, should come into force on the 1st September next.

3. The Conference also had under consideration the want of a revised set of general rules and regulations for all Indian railways, and the following resolutions were passed:—

i)—In the opinion of this Conference, a revised set of general rules and regulations for all Indian railways should be compiled and published under section 14 of the new draft Act, or under the corresponding section of the Act as passed.

(ii)—That Government be asked to appoint an officer to compile the rules and regulations, and that the Agent of each Company be requested to decide, on behalf of his own Company, on the adoption or modification of such rules.

(iii)—That the Agents of the several Companies be invited to send in to the Secretary of the Railway Conference any new rules or regulations they would like added to those now in force on their lines, and also any corrections or alterations they wished to have made in the existing rules.

4. The question of establishing Provident Funds for railway employes was discussed, and it was suggested that certain proposals submitted by the Agents of the Bombay, Baroda and Central India and Madras Railways be referred to the various Boards of Directors and the Government of India, with a view to ascertain if they would be prepared to contribute such a fund out of working expenses, and if so, to what extent.

5. The Hon'ble Sir Andrew Clarke brought before the Conference the subject of technical and industrial education for the children of railway employes, and said that he would be glad to learn the views of the Agents on the establishment of a large Central Technical and Industrial School in the hills for the elder children of railway employes. The State to build the school, the annual maintenance to be paid by the parents, and by a grant-in-aid, per pupil attending, from the revenue of the several lines. Schools to be constructed to accommodate at least 800 boys or 800 girls, as the expense per head for smaller numbers would be, in Sir Andrew Clarke's opinion, almost prohibitory. The Agents stated that they would, after communication with their London Boards, address Government on this matter.

6. Sir Andrew Clarke introduced for discussion the draft Railway Bill, which was read clause by clause, and various suggestions and alterations were noted for the consideration of the Select Committee to which the Bill had been referred.

RESOLUTION.—The Government of India learn with satisfaction that a practical set of rules for the interchange of rolling stock have been passed by the Conference.

2. The Resolutions touching on the compilation of a revised set of general rules and regulations are approved. Copies of the existing rules and regulations, and also the corrections

and alterations which are desired by the railway authorities, should be submitted to the Government of India at an early date.

3. The question of instituting Provident Funds should be taken into consideration.

4. Attention should be invited to paragraphs 34, 35 and 36 of the Conference Minutes on the subject of establishing a Central Technical and Industrial School for the children of railway employes; on this point Government will await the communications promised by the Agents of the Railway Companies.

5. The thanks of the Government of India should be conveyed to the Railway Delegates for the care and attention they have bestowed on the subjects brought before them, and for the careful and conciliatory manner in which the intricate question of interchange of rolling stock has been dealt with. The thanks of His Excellency the Governor General in Council are also due to Major-General J. S. Trevor, R.E., the President of the Conference, for his conduct of this special matter of the interchange of rolling stock.

*Proceedings of the Conference of Railway Delegates assembled at Calcutta on the 10th of February 1879, in accordance with Government of India, Public Works Department, Resolution No. 375—99 (Railway), dated 20th January 1879.*

INTERCHANGE OF ROLLING STOCK BETWEEN ALL CONNECTED BROAD GAUGE RAILWAYS IN INDIA.

No. 1.

1. At a Meeting of the Railway Delegates held at the Public Works Secretariat in Calcutta on the 10th February 1879—

PRESENT:

COLONEL J. S. TREVOR, R.E.	...	President.
G. L. MOLESWORTH, Esq., Consg. Engr. to Govt. of India, Delegate from State Rys.	...	Vice-President.
BRADFORD LESLIE, Esq., Agent and Chief Engr.,	”	E. I. Ry. Co.
FRANKLIN PRESTAGE, Esq., Agent,	”	E. B. Ry. Co.
COLONEL J. H. JENKINS, B.S.C., Agent,	”	O. & R. Ry. Co.
D. ROSS, Esq., Traffic Manager,	} Joint, with } one vote,	S., P. & D. Ry. Co.
JABEZ LIGHTFOOT, Esq., Auditor,		
F. MATHEW, Esq., Agent and Chief Engr.,	”	B., B. & C. I. Ry. Co.
H. CONDER, Esq., General Traffic Manager,	”	G. I. P. Ry. Co.
A. M. SAUNDERS, Esq., Agent and Manager,	”	Madras Ry. Co.

Members:

The following officers also attended the Meeting and joined in the discussion, but did not vote on the questions put to the Meeting—

N. St. L. CARTER, Esq., Traffic Manager, E. I. Ry. Co.  
CAPTAIN W. SEDGWICK, R.E., Offg. Manager, P. N. State Railway.  
J. CONDER, Esq., Traffic Manager, I. V. State Railway.  
CAPTAIN R. A. SARGEANT, R.E., Secy. to the Conference.

2. The following rule, which had been previously proposed and circulated, was read, viz. —

*Rule for regulating the mode in which the decisions of the Conference of Railway Delegates are to be arrived at and given effect to.*

“It shall not be competent for any representative of a Railway Company to intimate the withdrawal of his Company from any resolution arrived at by the majority of the Conference, but no resolution will be brought in force till three months have elapsed from the date on which it may be passed; and it will be open to the London Board of Directors of any Company within that period to record its dissent, on which such resolution will, as regards their line, be inoperative.”

Proposed by Mr. Saunders and seconded by S., P. & D. Ry. Delegate that the three months in the above rule be extended to six months. There being no objection raised to this extension



of time, the proposition was carried. With this modification the rule was agreed to (subject, as far as the Great Indian Peninsula Railway are concerned, to paragraphs 2 and 3 of their Agent's letter No. 1415 of the 30th January 1879, addressed to the Consulting Engineer for Railways, Bombay, being recorded below).

*Extract from Great Indian Peninsula Railway Agent's letter No. 1415.*

"2. With regard, however, to the rule proposed to be adopted for regulating the mode in which the decisions of the Conference are to be arrived at and given effect to, the circumstances of the English Railway Clearing House are hardly sufficiently similar to form a guide to the rule which should be adopted to provide for alterations in India. Moreover, any Resolution of the Conference would scarcely be in the hands of the Directors in sufficient time to enable them to communicate their opinion upon it within three months.

"3. I am therefore to state that the Agent cannot accept any decision arrived at by the Conference until it has been approved of by the Board of Directors."

3. General rules for interchange of rolling stock were then discussed.

The following rules were agreed to as applicable to all Indian broad gauge railways:—

GENERAL.

RULE I.—The day is to be reckoned as twenty-four hours, commencing at midnight, Madras time to be adopted in all cases. The week to end at midnight on Saturday.

No *dies non* to be allowed under these rules.

RULE II.—All stock to be considered as handed over when entered in the number taker's book at the junction station, and it is to be so entered directly it is put into the lines or sidings in which such stock is usually placed for that purpose.

Calculation of free time and demurrage charges to be reckoned from the first complete hour after delivery, fractions of hours being disregarded.

RULE III.—Passenger carriages, horse boxes, carriage trucks, break vans, and passenger road or luggage vans, are to be, in all cases, reckoned as coaching vehicles, whether they run upon passenger or goods trains. All other kinds of vehicles are to be reckoned as goods vehicles.

RULE IV.—No return vehicle shall be run, whether loaded or empty, unless otherwise mutually arranged, on any other than the exact route to its own line by which it was received, under a penalty of rupees twenty-two per diem from the time it was missent, until it returns to a station on the route by which it was received.

Vehicles may under the above conditions be loaded on their return journey to any station on the route to the owning line or beyond *via* the owning line.

RULE V.—So soon as the rolling stock of any railway passes into the custody or possession of any other railway, such other railway is to be responsible for all and every contingency that may arise from the use of such stock while it remains in their possession. Except that if the contingency is clearly traceable to defect of material or workmanship, the actual repair or replacement of the vehicle in which there was such defect, but not of any other vehicle or any other consequent damage, is to be at the expense of the owning railway.

The cost of repairs arising from ordinary wear and tear to be always borne by the owning railway; but cases of palpable damage (such as dropping heavy weights into wagons and so damaging the bottoms, neglect of greasing or oiling, and other similar neglects), and all cases of accidents or collision to be borne by the railway in whose custody or possession the stock may be at the time the damage occurs.

No claim shall be admitted for the cost of repairs of stock unless sent to the railway which is responsible for the payment of it within three months of the time at which the repairs are completed.

RULE VI.—Six additional days to be allowed in case of damage to the stock of either railway on the line of another railway for the repairs of such stock, and no demurrage shall be charged for those six days. But if the damage is such as will require longer than six days to complete the repair, the stock must be returned to the owning railway. If not sent within the six additional days, whether repaired or not, demurrage will be charged after the expiration of the six days unless specially exempted by the Traffic Manager of the owning railway.

Notice to be sent within one month to the owning railway in all cases how and when the damage took place and the nature of it.

## COACHING.

**RULE VII.**—The exchange of passenger stock to be subject in extent to mutual arrangement between the respective railways.

**RULE VIII.**—The mileage charge on coaching vehicles to be seven pies per mile both on the outwards journey and in returning, except that no mileage is to be charged on the return journey for horse boxes, carriage trucks, hospital carriages, prison vans, and special saloon carriages not used for ordinary traffic unless returning under load.

Double horse boxes while carrying four or more horses to be counted and charged mileage as two vehicles.

**RULE IX.**—Coaching vehicles to be allowed one hour for every twelve and a half miles run on foreign lines, and twenty-four hours extra at destination, free of demurrage.\*

**RULE X.**—Demurrage to be charged on all coaching vehicles detained beyond the time named in Rules VI and IX at the rate of eight annas per hour.

The Conference adjourned till 11 A.M. on the following day.

## No. 2.

4. The Conference re-assembled at 11 A.M. on Tuesday, the 11th February.

## PRESENT:

As on the 10th, with the exception that the Eastern Bengal Railway Company was represented by Mr. G. Low Calder, Chief Accountant, instead of by Mr. Prestage.

The proceedings of the previous meeting were read.

5. The discussion of the rules for the interchange of rolling stock was continued.

## Goods.

**RULE XI.**—The interchange of goods stock to extend to all connected lines and branches, a fair proportion of through traffic being accepted at junctions in time of pressure.

(N.B.—This rule has been modified in accordance with Resolution under paragraph 25, page 7.)

**RULE XII.**—All consignments of less than three tons to be transhipped at junction. In all other respects, the interchange of goods traffic and stock shall be unrestricted.

Traffic Managers to be at liberty to make exceptions by mutual agreement as to the amount to be transhipped in cases of consignments which, from their bulk or weight, fully occupy a wagon, or require exceptional care, such as furniture, glass-ware, stationery, millinery, pictures, musical instruments, &c., &c.

The above two rules were unanimously agreed to.

6. The following rule was then proposed:—

No mileage charge to be made on goods vehicles when running empty, or returning with a load of eighty-one maunds or more to the owning line.

Mr. Molesworth proposed as an amendment that all words after the word "empty" be struck out.

*For.*  
Mr. Molesworth.  
" Mathew.  
" Conder (G. I. P. Ry.).  
" Saunders.  
The S., P. and D. Ry. Delegate.

*Against.*  
Colonel Jenkins.  
Mr. Leslie.  
" Calder.

Colonel Trevor did not vote.



The amendment was carried and the rule passed as under, *viz.* :—

**RULE XIII.**—No mileage charge to be made on goods vehicles when running empty.

7. The following rule was next proposed :—

\* That, subject to the proviso in Rule XIII, mileage be paid to the sending railway for goods vehicles of all descriptions at the rate of one pie per ton or fraction of a ton of goods conveyed in either direction in such vehicles. In respect of every mile a goods vehicle of one railway may carry goods on the line of another railway.

Mileage to be paid on the weight entered in the invoice of charges.

This rule was agreed to by all Members of the Conference except Mr. Conder, Great Indian Peninsula Railway, who proposed a mileage rate of  $\frac{1}{3}$ rd of a pie per ton.

\* (For Rule XIV as finally passed, vide page 8.)

[When read at the following meeting the mileage rate was further discussed, and Mr. Conder (Great Indian Peninsula Railway) suggested that, with the view of obtaining an unanimous proposal, a compromise as to the rate of mileage be made, and that the rate be fixed at half of a pie per ton, and the daily speed at 150 miles. This met with no seconder.]

8. The Conference agreeing that a free allowance of time should be made according to the mileage run, on a foreign line or lines, and also that twenty-four hours should be allowed for unloading and the same for re-loading free of demurrage, it was put to the meeting whether the allowance of time should be reckoned both for coaching and goods vehicles by miles per hour or by miles per day.

*For miles per hour.*

Col. Jenkins.  
Mr. Leslie.  
" Mathew.  
" Calder.  
The S., P. and D. Ry. Delegate.

*For miles per day.*

Mr. Molesworth.  
" Conder (G. I. P. R.).  
" Saunders.

Colonel Trevor did not vote.

Carried, that the reckoning be made at per hour.

9. Mr. Leslie proposed an allowance of seven miles per hour.

*For.*

Mr. Leslie.  
Col. Jenkins.  
The S., P. and D. Ry. Delegate.  
Mr. Calder.  
Col. Trevor.

*Against.*

Mr. Molesworth.  
" Conder (G. I. P. R.).  
" Mathew.  
" Saunders.

Carried.

10. The opposers of this motion wished the following opinions to be recorded :—

Messrs. Molesworth and Mathew were in favour of a speed of six and a half miles an hour.

on Messrs. Conder (Great Indian Peninsula Railway) and Saunders were of opinion that the speed should be fixed at 140 miles a day.

11. The opinion of the majority being in favour of a speed of seven miles an hour, the following rule was passed, *viz.* :—

\* Goods vehicles to be allowed one hour for every seven miles run on a foreign line, and for unloading and re-loading twenty-four hours for each and every operation free of demurrage.

\* (For Rule XV, vide page 8.)

12. Mr. Conder proposed that a free allowance of twelve hours at each junction be granted. This being supported by Mr. Saunders only, was lost.

13. It was then proposed that demurrage should be at the rate of one anna per ton of carrying capacity.

<i>For.</i>	<i>Against.</i>
The Sind, Punjab and Delhi Railway Delegate. Mr. Calder. „ Leslie. Col. Jenkins. „ Trevor.	Mr. Conder (Great Indian Peninsula Ry.). „ Molesworth. „ Saunders. „ Mathew.

Carried.

14. Mr. Conder, in recording his dissent, stated that, in his opinion, the rate of demurrage should be Rs. 12 a day, or if the hourly rate had to be adopted, it should be annas 8 per hour. With this opinion Mr. Saunders concurred. Messrs. Molesworth and Mathew were in favour of the rate being fixed at annas 8 per hour.

15. The following clause was passed by the majority, *viz.* :—

RULE XVI.—Demurrage to be charged on all goods vehicles detained beyond the time named in Rules VI and XV at the rate of one anna per ton of carrying capacity per hour.

The Conference adjourned till 11 A.M. on the following day.

### No. 3.

The Conference re-assembled at 11 A.M. on Wednesday, the 12th February 1879.

16. PRESENT :—As at meeting No. 1.

The proceedings of the previous meeting were read.

17. Proposed by the Sind, Punjab and Delhi Railway Delegate that—

RULE XVII.—The receiving railway may call upon the forwarding railway to accept empty wagons with a view to equalize the ton-mileage.

This rule was agreed to without dissent.

18. Proposed by Mr. Leslie, and seconded by the Sind, Punjab and Delhi Railway Delegate, that—

RULE XVIII.—The railway on which through traffic originates shall provide wagons for such traffic. But when the through traffic offering is more than the wagon stock of the sending railway can cope with, it may call on the receiving railway to place a daily average capacity of wagon stock at its disposal at the junction for traffic to, and *via*, the receiving railway; and in the event of failure to comply within one week, the sending railway shall be entitled to charge two pice per ton-mile on all traffic to the extent of the wagon stock short supplied, which it may send through in its own stock: Provided that the receiving railway shall not be required to supply more wagons than sufficient to maintain an equal interchange of stock based on the carrying capacity. Open wagons to be accepted if supplied with proper sheets and ropes.

This rule was agreed to by all members of the Conference with the exception of Mr. Conder (Great Indian Peninsula Railway), who did not vote.

19. Proposed—

RULE XIX.—In case any goods vehicles are loaded on the homeward journey to any station short of the junction with the owning railway, the Audit Offices of the respective railways shall make a special return of the same to each other, and the mileage charge under Rule XIV shall be charged to the railway so loading such wagons.

This rule was agreed to without dissent.

20. Proposed by Mr. Conder (Great Indian Peninsula Railway), and seconded by the Sind, Punjab and Delhi Railway Delegate, that—

Whatever amount is paid for mileage, demurrage or penalty for wrong sending by any Company for the use of vehicles of other Companies is, in all cases, to belong, and be paid over to, the owning Company.

Mr. Leslie proposed as an amendment that the word "demurrage" be struck out.

<i>For.</i>	<i>Against.</i>
Mr. Leslie.	Mr. Molesworth.
" Prestage.	" Conder (Great Indian Peninsula Ry.).
Col. Jenkins.	" Saunders.
Mr Mathew.	The Sind, Punjab and Delhi Ry. Delegate.
Col. Trevor.	

The amendment was carried, and the rule passed as under :—

**RULE XX.**—Whatever amount is paid for mileage and penalty for wrong sending by any railway for the use of vehicles of other railways is in all cases to belong to, and be paid over to, the owning railway.

21. The following rule was proposed :—

**RULE XXI.**—Each railway to accept the statements of other railways with respect to the loads and wagons, unless the number takers at the junction notice and record that the loads have been interfered with, when the actual contents, and their condition, must be ascertained and recorded by a responsible officer of the receiving railway.

This rule was unanimously agreed to.

22. Proposed that—

**RULE XXII.**—The accounts referring to any mileage, demurrage or penalty for wrong sending, in which any railway is concerned, shall be open to the inspection of such railway.

This rule was passed without dissent.

23. The want of a revised set of rules and regulations for all railways in India was brought by the President before the Conference. Several of the existing rules and regulations were made under Act XVIII of 1854, section 29, and now require revision.

The President suggested that these rules should be printed in the manner adopted on English railways, *i.e.*, such portions as relate to all railways being in a uniform type, and the special rules for each railway, if any, exhibited in a type peculiar to each railway.

Such a compilation, he thought, could best be prepared by an independent officer, in communication with an officer of each Company nominated for the purpose.

*Resolved that*—In the opinion of this Conference, a revised set of general rules and regulations for all Indian railways should be compiled and published under section 14 of the new draft Act, or under the corresponding section of the Act as passed.

*Resolved further that*—Government be asked to appoint an officer to compile the rules and regulations, and that the Agent of each Company be requested to decide, on behalf of his own Company, on the adoption or modification of such rules.

*Resolved also that*—The Agents of the several Companies be invited to send in to the Secretary of the Railway Conference any new rules or regulations they would like added to those now in force on their lines, and also any corrections or alterations they wished to have made in the existing rules.

This was agreed to.

[Mr. Conder (Great Indian Peninsula Railway), not having been aware that this question was to be brought before the Conference, preferred not to express any opinion.]

The Conference adjourned till 3 P.M. on the following day.

#### No. 4.

24. The Conference re-assembled at 3 P.M. on Thursday, the 13th February.

**PRESENT:**—As at meeting No. 1, except that Mr. Carter did not attend.

The proceedings of the previous meeting were read.

25. Mr. Saunders proposed that the following be added to Rule XI, *viz.* :—

It shall not be competent for any railway Company to refuse to receive traffic booked through from connected Railways, so as to devote all their resources to traffic booked locally; but a fair proportion of through traffic must be accepted.

Mr. Molesworth proposed as an amendment that the following be added to Rule XI, *viz.* :—

A fair proportion of through traffic being accepted at junctions in times of pressure.

The amendment was carried unanimously.

26. Mr. Conder (Great Indian Peninsula Railway) stated that from what he had heard there was a disposition to re-consider Rules XIV, XV and XVIII, and requested that they might receive further discussion; and, with the consent of the President, he made the three following propositions, which were voted on as a whole :—

- (i) That the mileage rate for goods vehicles on foreign lines be fixed at  $\frac{1}{3}$  rds of a pie per ton or fraction of a ton of goods conveyed.
- (ii) That goods vehicles be allowed one hour for every  $6\frac{1}{2}$  miles run on a foreign line.
- (iii) That in Rule XVIII the rate per ton mile be fixed at double the ordinary mileage rate.

<i>For.</i>	<i>Against.</i>
Mr. Conder. „ Prestage. „ Mathew.	Colonel Jenkins. The Sind, Punjab and Delhi Ry. Delegate. Mr. Leslie. „ Saunders.

Colonel Trevor and Mr. Molesworth did not vote.

The motion was lost.

27. After further discussion, Mr. Conder (Great Indian Peninsula Railway) was given to understand that if he would withdraw the third item of his proposals, the Conference would, for the sake of arriving at a general agreement, accept his first two proposals. Mr. Conder (Great Indian Peninsula Railway) wishing to meet the general views of the Conference, and agreeing that a unanimous proposal on this much vexed and important question was desirable, withdrew his third item accordingly, and the following was put to the Conference :—

- (i) That the mileage rate for goods vehicles on foreign lines be fixed at  $\frac{1}{3}$  rds of a pie per ton or fraction of a ton of goods conveyed.
- (ii) That goods vehicles be allowed one hour for every  $6\frac{1}{2}$  miles run on a foreign line.

Carried without dissent.

The following rules were then passed :—

RULE XIV.—That, subject to the provisos in Rules XIII and XVIII, mileage be paid to the sending railway for goods vehicles of all descriptions at the rate of  $\frac{1}{3}$  rds of a pie per ton or fraction of a ton of goods conveyed in either direction in such vehicles, in respect of every mile a goods vehicle of one railway may carry goods on the line of another railway.

RULE XV.—Goods vehicles to be allowed one hour for every  $6\frac{1}{2}$  miles run on a foreign line, and twenty-four hours for unloading and twenty-four hours for re-loading at destination, and twelve hours at intermediate stations for each of these operations free of demurrage.

28. It was decided that the rules should be printed consecutively.

The Conference adjourned till 11 A.M. on Saturday, the 15th February.

#### No. 5.

29. The Conference re-assembled at 11 A.M. on Saturday, the 15th February.

PRESENT :—As at meeting No. 1, except that the following were absent—Mr. Molesworth, Captain Sedgwick, and Messrs. Carter and J. Conder.

30. The minutes of meetings were read from commencement, and some additions and verbal alterations made, which were embodied in the proceedings.

31. The rules for the interchange of rolling stock as settled from time to time by the Conference having been separately printed,\* were read and confirmed.

32. It was resolved that these rules, subject to the approval of the several Boards of Directors, come into force on the 1st September 1879. It being arranged that any notices which may have been given to terminate existing agreements be considered as expiring on the 31st August 1879.

33. Mr. Saunders brought forward for discussion the question of establishing Provident Funds for railway employés. It was decided that this should be taken up at a subsequent meeting.

34. The President, at the desire of Sir Andrew Clarke, handed to the Delegates copies of the rules for free passes on State Railways. He also stated that Sir Andrew Clarke trusted that all Companies would endeavour to encourage the education of the children of all railway employés, and grant them free conveyance to and from school. The Agents present promised that the matter should continue to receive consideration.

35. Sir Andrew Clarke (through the President) said that he would be glad to learn the views of the Agents on the establishment of a large Central Technical and Industrial school in the hills for the elder children of railway employés. The State to build the school; the annual maintenance to be paid by the parents, and by a grant-in-aid, per pupil attending, from the revenue of the several lines. Schools to be constructed to accommodate at least 800 boys or 800 girls, as the expense per head for smaller numbers would be, in Sir Andrew Clarke's opinion, almost prohibitory.

36. The Agents stated that they would, after communication with their London Boards, address Government on this matter.

The Conference adjourned till 11 A.M. on Monday the 17th February.

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No. 6.

37. The Conference re-assembled at 11 A.M. on Monday, the 17th February.

PRESENT:—As at meeting No. 5.

38. The minutes of the previous meeting were read.

39. Colonel Sir Andrew Clarke, K.C.M.G., C.B., R.E., joined the Conference.

40. The draft Railway Act was read clause by clause, and various suggestions and alterations were noted for the consideration of the Select Committee to which the Bill had been referred.

41. With reference to minute No. 33, the following resolution was passed:—

The Conference is of opinion that it is necessary to establish provident funds on all railways irrespective of surplus profits. They therefore suggest that Mr. Saunders' proposal, as well as one submitted by Mr. Mathew,† be referred to the various Boards of Directors and the Government of India, with a view to ascertain if they would be prepared to contribute to such a fund out of working expenses; and if so, to what extent.

The Conference was dissolved.

CALCUTTA;  
The 17th February 1879. }

J. S. TREVOR, Colonel, R.E.,  
President.

*Proposed Conference to consider General Rules and Regulations for Indian Railways.*

OBSERVATIONS.—At the Railway Conference assembled at Calcutta in February last, the following resolutions were passed, viz.:—

(1) "In the opinion of this Conference, a revised set of general rules and regulations for all Indian railways should be compiled and published under section 14\* of the new draft Act, or under the corresponding section of the Act as passed."

\* Attached.

† Printed and attached.

(2) "Government be asked to appoint an officer to compile the rules and regulations, and that the Agent of each Company be requested to decide, on behalf of his own Company, on the adoption or modification of such rules."

(3) "The Agents of the several Companies be invited to send in to the Secretary of the Railway Conference any new rules or regulations they would like added to those now in force on their lines, and also any corrections or alterations they wished to have made in the existing rules."

2. Several sections of the rules have now been revised and circulated for the consideration of the several Railway Administrations, and the remaining sections are in the press and will issue shortly.

RESOLUTION.—The general rules and regulations hitherto in force have remained the same with little alteration for the last twenty-four years. These were based on the railway practice of the day in England, and only one set of rules was allowed for all Indian railways.

2. Under the present law (section 8 of Act No. IV of 1879), every railway Administration is bound to make general rules for the purposes set forth, and such rules require the sanction of the Governor General in Council before they can take effect.

3. Under the same Act, section 26, it is a punishable offence for any railway servant to disobey "any rule or order not inconsistent with the general rules aforesaid, and which such servant was bound by the terms of his employment to obey, and of which he had notice."

4. As most Indian railways are now connected, and as several junction stations are common to two railways, and as in some instances the trains of one line work over portions of another line, and further as the subsidiary rules above described do not require formal sanction, the Governor General in Council is pleased to decide that, in the interests of good administration and of public safety and convenience, there should be, as far as practicable, one set of general rules applicable to all Indian railways.

5. With the view of compiling such a set of general rules it is proposed to hold a conference of Railway Delegates next cold season, by which time the opinions of all Railway Administrations on the revised drafts which have been circulated should have been received, and the work of deciding on a satisfactory code rendered comparatively easy.

6. The exact time and place of the proposed Conference will be notified hereafter; but in the meantime the Agents of Guaranteed Railway Companies should be invited to cooperate and nominate one or more Delegates to represent their railways.

*Proceedings of the Railway Conference held at Calcutta in January 1880.*

OBSERVATIONS.—The Conference of Railway Delegates assembled at Calcutta on the 6th January in accordance with Government of India Resolution now read again, and was attended by the following gentlemen:—

MAJOR-GENERAL J. S. TREVOR, R.E., Director General of Railways	...	<i>President.</i>
BRADFORD LESLIE, Esq., C.E., Agent and Chief Engineer, East Indian Railway Company	...	<i>Vice-President.</i>
D. W. CAMPBELL, Esq., Locomotive Superintendent	} Delegates from E. I. Ry. Co.	
N. ST. L. CARTER, Esq., Traffic Manager		
G. A. BARNETT, Esq., Agent		
H. CONDER, Esq., General Traffic Manager		
F. MATHEWS, Esq., C.E., Agent and Chief Engr.	Delegate	" B., B. & C. I. Ry. Co.
D. ROSS, Esq., Traffic Manager	} Delegates	" S., P. & D. Ry. Co.
C. SANDIFORD, Esq., Loco. Supdt.		
T. COX, Esq., C.E., Offg. Chief Engr.		
S. HARTWELL, Esq., Deputy Agent		" " O. & R. Ry. Co.
J. G. COOKE, Esq., Loco. Supdt.		
FRANKLIN PRESTAGE, Esq., Agent	} Delegate	" Madras Ry. Co.
J. BRANDER, Esq., Loco. Supdt.		
A. M. SAUNDERS, Esq., Agent and Manager	} " "	" S. I. Ry. Co.
F. H. TREVITHICK, Esq., Loco. Supdt.		
W. S. BETTS, Esq., Agent	} Delegates	" Bengal State Rys.
CAPT. W. A. J. WALLACE, R.E., Engr.-in-Chief and Manager		
A. W. RENDELL, Esq., Loco. Supdt.		
G. L. MOLESWORTH, Esq., C. E., Consgr. Engr. to Govt. of India		
COL. J. G. MEDLEY, R.E., Consgr. Engr. for Guaranteed Railways to the Govt. of India		" " State Railways.
CAPT. W. J. ENGLEDDUE, R.E., Offg. Manager, Dhond and Mannad State Railway.		
CAPT. R. A. SARGEANT, R.E., Depy. Consgr. Engr. for Guantd. Railways,		Secretary to the Conference.

2. The Conference held seven meetings, and was dissolved on the 13th January.
3. The Conference was convened for the purpose of revising the code of Rules and Regulations for Indian railways, and also for considering the question of adopting some uniform system of recording locomotive miscellaneous services. Other subjects hereafter mentioned, however, were permitted to be brought forward, and were fully discussed.
4. The draft Code of Rules and Regulations, which had been previously circulated, was discussed; and after laying down general principles and fixing certain salient points, a Sub-Committee of ten was appointed to consider the rules in detail. The following are the names of the gentlemen elected to serve :—
  - G. L. MOLESWORTH, Esq., Consulting Engineer for State Railways ... *Chairman.*
  - W. S. BETTS, Esq., Agent, South Indian Railway Co.
  - F. PRESTAGE, Esq., Agent, E. B. Railway Co.
  - S. HARTWELL, Esq., Deputy Agent, O. and R. Railway Co.
  - D. W. CAMPBELL, Esq., Locomotive Superintendent, E. I. Railway Co.
  - N. ST. L. CARTER, Esq., Traffic Manager, E. I. Railway Co.
  - H. CONDER, Esq., General Traffic Manager, G. I. P. Railway Co.
  - D. ROSS, Esq., Traffic Manager, S., P. and D. Railway Co.
  - F. H. TREVITHICK, Esq., Locomotive Superintendent, Madras Railway Co.
  - A. W. RENDELL, Esq., Locomotive Superintendent, N. B. State Railway.
5. The existing rules for the record of train-mileage and locomotive services were revised.
6. On the proposal of Mr. Mathew, it was agreed to recommend that "the carriage of material, including coal and ballast, on Revenue Account be charged to the Department requiring the material."
7. At the request of the Delegates from the East Indian, Madras and Great Indian Peninsula Railways, a rule regarding the interchange of rolling stock at junctions was passed subsidiary to Rule XVII of the Conference of 1879.
8. On the motion of Captain Wallace, it was decided to solicit Government to appoint a Committee to revise the forms of statistics of railway working.
9. Mr. Campbell brought forward the advisability of adopting one system of continuous brakes for all Indian railways.
10. On a proposition by Colonel Medley, the establishment of a central clearing-house was considered; and it was found to be the opinion of the Conference that the time had not yet arrived for such an institution.
11. A memorandum on the claims of Guaranteed Railway staff to Government pensions and retirement allowances signed by nine of the Delegates was recorded.
12. Certain questions were raised as to the application of the Government Savings Bank rules to Guaranteed Railway employes.
13. The adoption of an uniform goods classification for all India was considered, and an opinion recorded.

**RESOLUTION.**—The Government of India learns with satisfaction that a code of general Rules and Regulations for all Indian railways is in course of preparation, and awaits the result of the labors of the Sub-Committee.

The opinions given on the system of recording train-mileage and locomotive miscellaneous services will receive full attention; and revised rules based on the various resolutions passed should be prepared and submitted for sanction.

The proposal to charge for the carriage of all revenue stores would, if carried out, involve such a radical change in the Revenue Accounts that the Government of India hesitates to adopt it without further consideration, and desires to communicate with Her Majesty's Secretary of State on the subject before passing any definite orders.

It is trusted that the subsidiary rule, which has been added to the rules for the interchange of rolling stock passed at the Conference last year, will remove all difficulty experienced as regards this important question, and that the several Railway Companies will unite in render-

ing every facility in their power for the expeditious and effective working of through traffic by which the general welfare of the country as well as that of each railway undertaking is greatly affected.

A Committee will be appointed, as suggested, to revise the present form of railway statistics.

The Government of India considers the question of uniformity of continuous brakes for all connected railways one of great importance, and fully concurs in the views brought forward by Mr. Campbell; and, in order to avoid the adoption of various systems on different Indian lines, desires that no system be adopted without its previous sanction.

The thanks of the Government of India should be communicated to the Railway Delegates for the service they have rendered and for the valuable opinions they have recorded.

*Proceedings of the Conference of Railway Delegates assembled at Calcutta on the 6th of January 1880, in accordance with Government of India, Public Works Department, Resolution No. 262—81R.T., dated 18th November 1879.*

## No. 1.

1. The Conference assembled at the Public Works Secretariat in Calcutta at noon on Tuesday, the 6th January 1880.

## PRESENT:

MAJOR GENERAL J. S. TREVOR, R.E., Director General of Railways ...		PRESIDENT.	
BRADFORD LESLIE, Esq., C.E., Agent and Chief Engineer, E. I. Ry. Co.		VICE-PRESIDENT.	
G. A. BARNETT, Esq., Agent,	} Delegates from G. I. P. Ry. Co.	} MEMBERS.	
H. CONDER, Esq., General Traffic Manager,			
F. MATHEW, Esq., C.E., Agent and Chief Engineer,			" " B., B. & C. I. Ry. Co.
D. ROSS, Esq., Traffic Manager,			" " S., P. & D. Ry. Co.
C. SANDIFORD, Esq., Locomotive Superintendent,			" " O. & R. Ry. Co.
T. COX, Esq., C.E., Officiating Chief Engineer,			" " E. B. Ry. Co.
S. HARTWELL, Esq., Deputy Agent,			" " Bengal State Railways
J. G. COOKE, Esq., Locomotive Superintendent,			" " State Railways
FRANKLIN PRESTAGE, Esq., Agent,			" " E. I. Ry. Co.
J. BRANDER, Esq., Traffic Superintendent,			" " S. I. Ry. Co.
CAPTAIN W. A. J. WALLACE, R.E., Engineer-in-Chief and Manager, Northern Bengal State Railway,			
A. W. RENDELL, Esq., Locomotive Supdt., N. B. S. Ry.,			
G. L. MOLESWORTH, Esq., C. E., Consg. Engr. to Govt. of India,			
COL. J. G. MEDLEY, R.E., Consg. Engr. for Guaranteed Railways to the Government of India,			
CAPTAIN W. J. ENGLEDEUR, R.E., Offg. Manager, D. and M. State Railway,			
D. W. CAMPBELL, Esq., Locomotive Superintendent,			
N. ST. L. CARTER, Esq., Traffic Manager,			
W. S. BETTS, Esq., Agent,	Delegate "		
CAPTAIN R. A. SARGEAUNT, R.E., Deputy Consg. Engr. for Railways ...		Secretary to the Conference.	



The following telegram was received from Madras :—

“Agent and Locomotive Superintendent, Madras Railway, will reach Calcutta on Thursday night for Conference.”

2. The Conference proceeded to consider the general Rules and Regulations.

As in the general opinion of the Conference the draft rules entered into too much detail, it was agreed in the first instance to decide on what points rules should be drawn up and submitted for the sanction of the Governor General in Council in accordance with section 8 of the Railway Act of 1879, for general adoption on all Indian railways.

3. Mr. Conder, General Traffic Manager, Great Indian Peninsula Railway, remarked that, as the Conference was constituted, it was a question whether each delegate should have a separate vote, and proposed that—

The State Railways combined and that each Railway Company have only one vote each. On this point there was some discussion; but it was decided that votes should be taken individually, each delegate having one vote.

4. The subjects comprised in sections I, II, III and VI having been discussed, it was agreed that the following rules of the draft be struck out, being replaced, where necessary, by subsidiary rules framed by each Railway Administration, viz. :—Rules 4, 23, 29, 32, 33, 31, 37, 39, 40, 41, 44, 48, 97, 138 (first paragraph), 148, 151, 153, 154, 158, 163 and 165.

It was also decided that—

Rule 129 be transferred to section VIII, “Guards.”

Rule 163 be replaced by a new rule.

Rules 167 and 168 be transferred to section I, and that—

Rule 169 be placed after Rule 171.

The Conference adjourned till the following day.

#### No. 2.

5. The Conference re-assembled at 11 A.M. on Wednesday, the 7th January.

PRESENT :—As at Meeting No. 1.

6. The consideration of the general Rules and Regulations was continued; and the subjects comprised in sections IV, V, VII, VIII and IX as far as Rule 293 having been discussed, it was agreed that the following rules of the draft be struck out, viz. :—63, 73, 84, 86 to 93 inclusive, 175, 176, 180, 183, 187, 197, 206, 212, 218, 225, 226, 228, 229 (last two paragraphs), 232 (first paragraph), 237, 239, 249, 252, 253, 254, 256, 260, 261, 288 (last two paragraphs), 290. (last paragraph).

It was also decided that—

Section V should be re-cast so as to conform more closely to the existing practice on Indian railways.

That—

The note at head of Section VI should be incorporated in the definitions, and that—

Rules 191, 223 and 289 be entirely re-cast.

From Rule 224 to omit from “when” in line 4 to “station” in line 8.

In Rule 278 the latter portion stands as follows—“without a written order, except in cases of unavoidable necessity to be established by the engine driver.”

In Rule 282 the portion after “distant signal” in line 7 be omitted.

The Conference adjourned till the following day.

#### No. 3.

7. The Conference re-assembled at 11 A.M. on Thursday, the 8th January.

PRESENT :—As at previous meetings, with the addition of—

A. M. SAUNDERS, Esq.,  
Agent and Manager  
F. H. TREVITHICK, Esq.,  
Locomotive Superintendent

} Delegates from Madras Railway Company.

8. The consideration of the general rules and regulations was continued to the end of section X.

It was decided that the following portions of the draft be struck out, *viz.*—

In rule 294 from the word "when," line four, to the word "station" inclusive; rules 296, 298; paragraph 3, 300, paragraph 2, the words "and must not stop short of, or overrun the platform"; 300 paragraph 5, in note 303 all words after "operation," rules 305, 306, 307, paragraph 1, 309, 310, 316, 320, 321, 322, 322a.

It was decided that the following rules be added in the proper place, *viz.*—

Engine drivers with trains must run within the limits of speed fixed for the section of the line they are upon; but these limits, on the 5' 6" gauge are not on any line to exceed for passenger trains 60 miles an hour, and for goods or mixed trains 30 miles an hour, and on the metre gauge, are not to exceed for passenger trains 40 miles an hour and for goods or mixed trains 20 miles an hour.

Engine drivers with trains must not make up between stations more time than is allowed to be made up in that distance by the Railway Administration.

It was agreed to strike out the following, *viz.* :—

Rules 332, 334, 344 paragraph 2, 345, in rule 346 the words from "every" to "also" inclusive, 347, 348 the words "in a length of at least twenty yards," 360 the words "to secure themselves from the risk of passing trains," 361, 364, 365, 366.

It was decided that—

in 335 for "one mile" read " $\frac{1}{2}$  mile on the level and  $\frac{3}{4}$  mile on a falling gradient steeper than 1 in 250," in rules 336 and 338 that "a quarter of a mile" be substituted for "half a mile," and after "mile" in 338, paragraph 1, add "or such lower speed as may be ordered."

That—

A general rule on the subject of rule 345 be added to section I.

Rule 340 be modified as follows :—

No lorry used for the conveyance of material, trolley for the conveyance of men may, in any case, be placed on the line, except by the authorized person, who is responsible for its proper protection and use according to the rules in force on the Railway.

In 339 for "is" substitute "loaded or empty," and omit the words "or men along the line," for "three quarters of" substitute "half," for "any" substitute "a double."

That—

After the word "lorry" in rule 341, the words "or trolley" be added,

That after the word "due" in rule 342 the words be added "except on lines worked on the block system when the time must not be less than five minutes."

In 357 for "two feet" "three feet" be substituted,

9. It was proposed by Mr. Barnett that—

the consideration in detail of the rules generally agreed to, be referred to a Sub-Committee.

This was agreed to without dissent,

The Conference adjourned till the following day.

#### No. 4.

10. The Conference re-assembled on Friday the 9th January at 11 A.M.

Present :—As at meeting No. 3.

11. The President proposed that—

A Sub-Committee of ten members of the Conference, *viz.*—

2 from the East Indian Railway,	1 from the B. B. and C. I. Railway,
1 " O. and R. " "	1 " G. I. P. Railway,
1 " S. P. and D. " "	1 " S. I. " "
1 " Madras " "	2 " State Railways,

be appointed to revise rules in detail.

And that the revised rules, when prepared, be circulated to the Railway Administrations for re-concurrence on general principles before submission for sanction of the Governor General in Council.

Mr. Saunders proposed as an amendment that—

From the General Conference, 3 Sub-Committees be formed from the 3 Executive Departments to consider and reframe the rules, and to report to the General Conference as soon as they have completed their work. It being suggested to them that one week should be sufficient for the purpose.

The amendment was lost.

Mr. Molesworth proposed that—

Four officers be elected by the Members of the Conference to consider the wording of the rules, *viz.* :—

An Agent,  
An Engineer,  
A Traffic Manager,  
A Locomotive Superintendent,

and that a State officer nominated by the President be added to act as Chairman of the Sub-Committee, having only a casting vote.

This amendment was lost.

The original proposition being carried, the following were elected Members of the Sub-Committee, *viz.* :—

Mr. Molesworth, Chairman.

Mr. Carter.  
„ Campbell.  
„ Hartwell.  
„ Ross.

Mr. Conder.  
„ Trevithick.  
„ Betts.  
„ Prestage.

Mr. Rendell.

Colonel Medley proposed that—

In case no reply is received from any Railway Administration within six months of the date on which the revised rules are put in circulation, it shall be understood that such Administration has no objection to their being formally sanctioned.

12. This was carried *nem. con.*

13. The consideration of the general Rules and Regulations was continued.

It was decided that—

In Rules 368 all words after “ train-guards ” be struck out.

In Rules 371 the word “ require ” be substituted for “ direct.”

Rule 372 read “ No ballasting is to be carried on except with permission of the Engineer in charge of the section of Railway.”

Rule 373 be struck out.

Rule 376 be made to agree with 342.

Rule 377 be repeated in section of definitions.

In Rule 382 the words “ when authorized ” be struck out and after “ fog ” “ or dust storm ” be added.

Rule 383 read “ Ballast trains may be run with a pushing engine on a written order, but in such cases the speed must not exceed fifteen miles an hour,” or be recast in these terms to agree with Rule 295.

In Rule 386 the words “ *viz.*, a tri-coloured hand lamp, red, green, and white flags and 12 detonating signals,” be struck out.

In Rule 387 omit “ locked.”

Rule 389 be omitted.

In Rule 395 omit “ person from.”

In 398 for “ test the ” read “ satisfy himself of the proper.”

In Rule 401 for the words “ when the following precautions must be adopted ” substitute “ on the authorized rules for working in such cases in force on the Railway.”

The subsequent portion of section XIII be struck out.

14. On the proposal of Mr. Barnett it was agreed that the Sub-Committee be requested to revise Sections XIV, XV, XVI, XVII and XVIII, and frame a set of general rules for each system of working applicable to all Indian Railways.

Mr. Saunders observing that the system in force on the Madras Railway was not provided for, it was agreed that a section should be added to make good the omission.

Mr. Conder proposed that—

Rule 1 in Section I be modified as follows :—

Every line of Railway upon which engine power is used for the conveyance of passengers must be worked upon one of the following systems, namely—

A.—Line clear obtained by telegram by which either authority is given for one train only to run between any two stations at one time, or authority is given for trains to follow each other between any two stations at intervals.

B.—Train despatching,

C.—Train Staff and Ticket,

D.—Pilot Guard,

E.—One engine only,

in accordance with the Rules laid down in section \* \* for the several systems respectively.

Mr. Molesworth proposed as an amendment that—

Rule read—

Every line of Railway upon which engine power is used for the conveyance of passengers must be worked on one of the following systems, viz.:—

“ Line clear and caution message.”

“ Absolute Block.”

“ Train Despatching.”

“ Train Staff and Ticket.”

“ Pilot Guard.”

“ One engine only.”

in accordance with the Rules laid down in sections \* \* for the system adopted.

Mr. Saunders proposed as an amendment that—

The wording of Rule 1 be left to the Sub-Committee with instructions to define the systems under which lines may be worked with or without an electric telegraph.

The amendment being lost, Mr. Molesworth's amendment was put to the Meeting and carried.

15. Major A. Filgate, R.E., Officiating Accountant General, Public Works Department, joined the Conference.

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*System of recording shunting and other miscellaneous locomotive services.*

16. Proposed by the President that—

All light engine running required to equalize the up and down traffic mileage be classed as traffic train-mileage, and that the divisions under train-miles run for the Traffic Department be—

Passengers.

Goods.

Mixed.

Light.

After discussion this was carried by a majority.

17. Proposed by Mr. Barnett that—

The mileage of mixed trains be divided between coaching and goods in the proportion of the mileages of goods and coaching vehicles on such trains, and that light engine mileage be reckoned as goods or according to the class of train from which the necessity for such light mileage arose.

This was agreed to.

## 18. Proposed by Mr. Mathew that—

In the opinion of this Conference it is desirable, and that it be recommended that the carriage of material, including coal and ballast, on revenue account be charged to the Department requiring the material.

The proposition was adopted.

The Conference adjourned till the following day.

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 No. 5.

## 19. The Conference re-assembled at 11 A.M. on Saturday the 10th January.

Present:—As at the latter portion of Meeting No. 4, with the exception of Colonel Medley and Captain Wallace, who were unavoidably absent.

## 20. Proposed by Mr. Leslie that—

Paragraph c of the existing Government rules as follows be adhered to.

## Proposed by Mr Ross as amendment that—

The mileage of trains containing vehicles running on revenue account be divided on the same principle as that adopted for the division of mixed train, between coaching and goods.

The amendment being lost, the original proposition was carried.

## 21. Proposed by Mr. Cox that—

A mileage allowance be made per hour for the whole time engines are kept under steam for the Engineering Department.

Carried.

Mr. Cox proposed that a rider be added to the preceding, *viz.*, that—

The above rule does not apply to any time-table train running for the Engineering Department.

This proposition was lost.

## 22. Mr. Leslie proposed that—

The mileage allowance for engineering trains be at the rate of 8 miles an hour, with a minimum of 5 hours a day.

Mr. Trevithick proposed as an amendment that—

The mileage allowance for engineering trains be at the rate of 10 miles an hour with a minimum of 60 miles a day.

Mr. Cooke proposed as an amendment that—

The mileage allowance for engineering trains be at the rate of 6½ miles an hour.

Both amendments being lost, the original proposition was carried.

## 23. Proposed by Mr. Saunders that—

The time for engineering trains be reckoned from the time the engine is taken charge of each day by the Traffic Department for working the train until it is released from duty by the Traffic Department.

Carried.

## 24. Proposed by the President that—

The time occupied at stations by traffic train engines standing in steam be not taken into account.

Carried.

## 25. Proposed by Mr. Trevithick that—

If any engine is lighted up by order of the Traffic Department, but not used, a minimum allowance of five hours be made to the Locomotive Department as shunting mileage.

Proposed as an amendment by Mr. Carter, that "three hours" be substituted for "five hours."

The amendment was carried.

26. Mr. Campbell proposed that—

Any shunting done by train engines at road side, terminal and changing stations, beyond ten minutes shunting done to their own trains, be booked from commencement, a certificate for the same being obtained from the Station Master.

Mr. Conder proposed as an amendment that—

No shunting certificate be given for less than 15 minutes and that the first 15 minutes shunting be not reckoned.

The amendment was carried.

27. Mr. Campbell proposed that—

All shunting done by engines, specially provided at the request of the Traffic Department at terminal, changing, or other stations, be reckoned, and that the whole time such engines are "standing in steam" be allowed.

Carried.

28. Proposed by the President that—

The word "piloting" be struck out in clause *e* of the present Rules, and the words "standing in steam for traffic purposes" be inserted instead.

Carried.

29. Proposed by Mr. Campbell that—

All time of engines used for shunting or standing in steam for traffic purposes be reckoned at five miles an hour.

Mr. Saunders proposed as an amendment—

That the rate be fixed at 6 miles an hour.

The amendment being lost, the original proposition was carried.

30. Proposed by the President that—

The word "piloting" be limited to engines running for the protection of trains, and that the mileage of such engines be reckoned as traffic train-mileage.

Carried.

31. Proposed by Mr. Barnett that—

No record be kept of the time occupied in lighting fires, and getting in and out of shed.

Carried *nem. con.*

The Conference adjourned till Monday the 12th January.

32. At Meeting No. 6, when the proceedings were read for confirmation, it was—

Proposed by Mr. Molesworth that—

In the heads *d*, *e*, and *f* of the Government Rules the word "time" be struck out, and that the heads read—

(*d*)—Miles run in assisting disabled engines.

(*e*)—Miles run in shunting calculated at 5 miles an hour.

(*f*)—Miles run for miscellaneous services calculated on the actual distance run.

Carried.

33. Proposed by the President that—

The resolutions arrived at be embodied in a revised draft of rules for recording mileage, and that they be adopted from the 1st January 1880.

Carried.

## No. 6.

34. The Conference re-assembled at noon on Monday the 12th January.

Present:—As at the latter portion of Meeting No. 4.

35. The proceedings of Meetings 1 to 5 were read, and the proposals shown in clauses 32 and 33 were added.

36. Mr. Saunders stated that—

Since the introduction of the rules for interchange of rolling stock passed at the last Conference, questions have arisen respecting the working of Rule XVII. And the East Indian and Great Indian Peninsula Railway Companies join with the Madras Railway Company in requesting that this rule may be discussed by the Conference before it separates.

It was agreed to discuss the question.

37. Proposed by Mr. Leslie and seconded by Mr Saunders that—

Rule XVII should only be brought into force when the daily average excess of wagons passing the junction in one direction exceeds for one week thirty per diem, and in that case the forwarding Company should not be called upon to take more than one-third of such excess number in empties. The demurrage on these empties to be paid at the rate of two pies per ton of carrying capacity per hour instead of at the usual rate. This ruling to have force from the 1st January 1880.

Carried without dissent.

The Conference adjourned.

## No. 7.

38. The Conference re-assembled at 11 a.m. on Tuesday the 13th January.

Present:—As at Meeting No. 6.

39. The proceedings of Meeting No. 6 were read and confirmed.

40. Proposed by Mr. Ross that—

To ruling in minute 37 the following be added—

That forty-eight hours' notice be given by wire by the receiving Company of its intention to forward empties.

This was agreed to.

41. Proposed by Mr. Leslie that—

In addition to the resolution in minute 17—

It also be recommended that in statistics of Railway working, the results be shown on passenger, ton and vehicle mileage, as per attached extract of letter dated the 7th December 1878 (printed Appendix).

Proposed by Captain Wallace as an amendment—

That the present statistical returns require revision, with a view to uniformity in the statements prepared, and a reduction of the quantity of useless information furnished at great labor and expense. Government be requested to appoint a Committee to make this revision at an early date, and that Mr. Leslie's memorandum, dated 7th December 1878, be placed before the Committee for careful consideration.

The amendment was carried.

42. Proposed by Mr. Campbell that—

Proposals having been put forward for the introduction of continuous brakes, it is recommended that one system be adopted on all Indian Railways, in order that vehicles belonging to the different Railways may be so fitted as to be easily interchangeable; thus avoiding the very great inconvenience, insecurity and expense at present found to be the case on English Railways through so many different kinds of continuous brakes being in use of lines running in connection with one another.

Adopted.

43. Proposed by Colonel Medley, seconded by Mr. Saunders that—

In the opinion of this meeting, the time has arrived for the establishment of a Railway Clearing House in some central position (such as Jubbulpore) for the whole system of Indian Railways on the basis of the English clearing house, and that the Government be asked to undertake the subject accordingly.

For the proposition	...	8 votes.
Against	...	15. "

Lost.

44. Mr. Mathew, seconded by Mr. Saunders, desired that the following might be recorded in the minutes. This was agreed to :—

- The undersigned members of the Conference, before separating, desire to submit to Government, and to the Home Boards of the Guaranteed Companies, the claims of the members of Railway staff in India to such privileges as regards pensions and retirement allowances as Government has allowed to the members of every other branch of the public service in this country.
2. The cost of pensions and retirement allowances would, in part, fall on the Railway shareholders, and the undersigned are confident that the Railway Companies would willingly contribute their share on any scale adopted and recommended by Government.
  3. The Members of the Indian Railway Staff, whose services Government has frequently in formal resolutions acknowledged, have, now, during several years, been looking forward to a settlement of the claims which they have submitted; and, after the meeting of this Conference held a year ago, it was hoped that suitable regulations would have been established.
  4. Looking to the progressive increase of the revenue from Indian Railways and the further growth of that revenue, which may with confidence be anticipated, it is submitted that the provision of pension and retirement allowances for the members of the staff may be made—without disturbing the financial budget of the department—with real advantage to the public service and to the Railway Companies, as well as to the members of the working establishment.
  5. The undersigned, with the conviction that the measure, whilst being only fair to the members of a service which has most arduous duties to perform, would also, by offering an inducement to continuous service, and by facilitating retirement in due time, conduce to efficient and economical working of undertakings which have now become of great magnitude, beg most respectfully to submit the subject for the consideration of Government.

A. M. SAUNDERS, Agent and Manager, Madras Railway.

W. S. BETTS, Agent, South Indian Railway.

F. MATHEW, Agent and Chief Engineer, Bombay, Baroda and Central India Ry.

F. PRESTAGE, Agent, Eastern Bengal Railway.

J. BRANDER, Traffic Superintendent, Eastern Bengal Railway.

F. H. TREVITHICK, Locomotive Superintendent, Madras Railway.

J. G. COOKE, Locomotive and Carriage Superintendent, Oudh and Rohilkhund Railway.

C. SANDIFORD, Locomotive and Carriage Superintendent, Scind, Punjab and Delhi Railway.

T. COX, Acting Chief Engineer, Scind, Punjab and Delhi Railway.

D. ROSS, Traffic Manager, Scind, Punjab and Delhi Railway.

45. Mr. Conder brought up the rules lately promulgated for the formation of State Railway Savings Banks, and enquired whether the Government of India would withdraw, in the case of the servants of Guaranteed Railway Companies, the restriction of deposits to a maximum of Rs. 5,000 in one year, and also whether Government were disposed to listen favourably to any proposals for the extension of these rules to Guaranteed Companies.

The President, in reply, stated that there would probably, on application, be no objection to cancel the maximum annual limit for deposits, and that the Government of India would be inclined to regard with favour any suggestion for the extension of the State Railway Savings Banks rules to Guaranteed Companies, but that no pledge could be given, as the question would have to be referred for the orders of the Secretary of State.

Recorded.

46. Enquiry was made by the President whether it would be desirable on another occasion to bring before a Conference the question of the adoption of an uniform goods classification for all India.

On the matter being discussed it appeared that in the opinion of the Members it was certainly desirable that differences in the classifications of the several Railway Administrations should be removed as far as possible, and it was gathered that communications were frequently passing between Traffic Managers with this object. It was, however, impossible in a large country like India to obtain the desired result without experience and careful study of the local peculiarities of Railway goods traffic. Under these circumstances it was considered that the time had not yet arrived when a satisfactory result could be hoped for from a discussion at a Conference, and it was decided that the subject should be left to the several Railway Administrations with a recommendation that the removal of variations should continue to receive the attention of the traffic officers.

The Conference was dissolved.



## APPENDIX E.

### Report of the Committee appointed to consider the question of Wind Pressure on Railway Structures.

The disaster of the Tay Bridge led to the appointment by the Board of Trade of a Committee to consider the question of wind pressure on Railway Structures.

The following distinguished gentlemen were appointed to serve on the Commission :—

Sir William George Armstrong, C.B., F.R.S.  
William Henry Barlow, Esq., F.R.S.  
Sir John Hawkshaw, F.R.S.  
Professor George Gabriel Stokes, M.A., D.C.L., F.R.S.  
Colonel William Yolland, R.E., F.R.S.

The report has been published, and is so extremely interesting that extracts from it are published in this report :—

#### WIND PRESSURE (RAILWAY STRUCTURES) COMMISSION.

*To the Right Honourable the President of the Board of Trade.*

*London, May 20th, 1861.*

SIR,—In compliance with the instructions from the Board of Trade (a copy of which is given in the Appendix) to consider the question of wind pressure on railway structures, and to report to them on the subject, we have made such inquiries and procured such information on the subject referred to us as we deemed necessary, and have now the honour to report the conclusions at which we have arrived.

It was necessary in the first instance to ascertain as accurately as possible from the sources which were accessible to us what the highest pressures of the wind in this country amount to. With this object we obtained from those observatories and stations where the pressure or velocity of the wind is measured the statements which we give in the Appendix. In order to exhibit the action of the wind during heavy storms, we have also appended lithographed copies of wind diagrams taken by means of self-registering apparatus at Bidston, Glasgow and Greenwich.

At some of the stations from which we have obtained returns the wind pressures are measured directly by Osler's self-registering pressure anemometers; at others the velocity only of the wind is measured by Robinson's rotating anemometers, the velocity of the wind being taken at three times the velocity of the revolving cups.

For some stations the only published information is the run in miles of the wind during each hour. These can obviously be no more than a general accordance between this and the greatest pressure experienced during the hour. To utilize for our purpose observations taken at stations where the velocity only of the wind is recorded, the records of the Bidstone Observatory, where both elements are recorded, have been employed as furnishing a means of connection between the two. In the case of high winds, with which alone we have to deal, it was found that the greatest pressure recorded in an hour was tolerably well proportional to the square of the mean velocity during the hour, and that the empirical formula  $\frac{V^2}{100} = P$ , where  $V$  = maximum run in miles of the wind in any one hour and  $P$  = maximum pressure in pounds on the square foot at any time during the storm to which  $V$  refers, represented very fairly the greatest pressure as deduced from the mean velocity for an hour. We have accordingly given in the Appendix a table calculated from the above formula for deducing maximum pressures from observed velocities.

In addition to the tables obtained from English, Irish and Scottish stations, which are those only that are strictly applicable to our inquiry, we give as matter of information a summary of strong winds registered at stations on the Continent and in India.

It will be seen on reference to the Tables that the wind pressures vary greatly at different stations. This, no doubt, mainly arises from difference of exposure of the stations to the action of the wind in consequence of the geographical and local circumstances of their position, but may in some cases be partly caused by differences in the instrument used for measurement. Thus at Glasgow the highest recorded pressure per square foot is 47 lbs., while at Bidston near Liverpool the indicated pressure on one occasion amounted to 90 lbs., and on another occasion to 80 lbs.

But the pressures at Bidston seem very abnormal, being much beyond what have been noticed at any of the other stations. The conformation of the ground on which the Bidston Observatory stands is such that the velocity of the wind there might be greatly intensified.

It will be noticed in the lithographs that the records of exceptional high pressures indicate a very brief duration. From inquiries we have made, we are satisfied that these records are not referable to instrumental error, depending on the recording instrument being carried by 'its momentum beyond' the position of equilibrium under the wind pressure acting at the moment, but represent a real phenomenon. But whether the exceptionally high velocities to which such pressures are due extend over a considerable space in a lateral direction, or, on the other hand, are extremely local, is a point on which we have not been able to find experimental evidence.

The differences of the wind pressures observed at different stations led us to consider whether there were any other modes of approximately ascertaining the force of the wind for our purpose. There are many buildings, tall chimneys, ship building sheds, &c., which probably would not withstand pressures so extreme as those we refer to; but in most cases the contour of the adjoining ground, and the obstruction to wind by adjoining buildings, trees, and other surrounding objects would render conclusions drawn from such cases unreliable. It occurred, however, to us that some useful information might be drawn from another source, *viz.*, from railways themselves.

It is obvious that on existing railways that have been long in use, a series of experiments, if we may apply such an expression to them, have for many years been carried on; for over them trains have been running at all times of the day and night on high and unsheltered embankments and along other spaces exposed in many cases to very strong winds.

Now, a wind pressure varying from 30 to 40 lbs. per square foot is sufficient to overturn the ordinary railway carriages that have been in use during the last twenty-five or thirty years; and we thought it useful to inquire from the different Railway Companies for cases where railway carriages have been overturned by the force of the wind. The only cases of this kind that have been brought to our knowledge are appended to this Report.

From the information thus acquired, from the inquiries we have made, and from the consideration we have given to the subject, we are of opinion that the following rules will sufficiently meet the cases referred to us:—

- (1) That for railway bridges and viaducts a maximum wind pressure of 56 lbs. per square foot should be assumed for the purpose of calculation.
- (2) That where the bridge or viaduct is formed of close girders, and the tops of such girders are as high or higher than the top of a train passing over the bridge, the total wind pressure upon such bridge or viaduct should be ascertained by applying the full pressure of 56 lbs. per square foot to the entire vertical surface of one main girder only. But if the top of a train passing over the bridge is higher than the tops of the main girders, the total wind pressure upon such bridge or viaduct should be ascertained by applying the full pressure of 56 lbs. per square foot to the entire vertical surface from the bottom of the main girders to the top of the train passing over the bridge.
- (3) That where the bridge or viaduct is of the lattice form or of open construction the wind pressure upon the outer or windward girder should be ascertained by applying the full pressure of 56 lbs. per square foot, as if the girder were a close girder, from the level of the rails to the top of a train passing over such bridge or viaduct, and by applying in addition the full pressure of 56 lbs. per square foot to the ascertained vertical area of surface of the ironwork of the same girder situated below the level of the rails or above the top of a train passing over such bridge or viaduct. The wind pressure upon the inner or lee-ward girder or girders should be ascertained by applying a pressure per square foot to the ascertained vertical area of surface of the ironwork of one girder only situated below the level of the rails or above the top of a train passing over the said bridge or viaduct, according to the following scale; *viz.*—
  - (a) If the surface area of the open spaces does not exceed two-thirds of the whole area included within the outline of the girder, the pressure should be taken at 28 lbs. per square foot.
  - (b) If the surface area of the open spaces lie between two-thirds and three-fourths of the whole area included within the outline of the girder, the pressure should be taken at 42 lbs. per square foot.
  - (c) If the surface area of the open spaces be greater than three-fourths of the whole area included within the outline of the girder, the pressure should be taken at the full pressure of 56 lbs. per square foot.
- (4) That the pressure upon arches and the piers of bridges and viaducts should be ascertained as nearly as possible in conformity with the rules above stated.
- (5) That in order to ensure a proper margin of safety for bridges and viaducts in respect of the strains caused by wind pressure, they should be made of sufficient strength to withstand a strain of four times the amount due to the pressure calculated by the foregoing rules. And that, for cases where the tendency of the wind to overturn structures is counteracted by gravity alone, a factor of safety of 2 will be sufficient.

With regard to the eighth paragraph of the Report of the Select Committee on the North British Railway (Tay Bridge) Bill, to which you have drawn our attention, we beg to observe that where trains run between girders they will generally be sufficiently pro-

tected from the wind, the degree of protection afforded by the girders depending on the extent to which the girders are open or close; where the girders are so open as to afford insufficient protection, or where trains run, as in some cases they may do, on the tops of girders, we assume that the engineer will provide a sufficient parapet; but we are indisposed to go further into detail on this subject, as it might tend to stereotype modes of construction, which we think is undesirable.

In conclusion, we beg to point out that the velocity of wind, like that of every other moving body, is more or less retarded by friction, and will be affected therefore by the character of the surfaces over which it has to pass, which may be rough, smooth, or irregular. It will follow, therefore, that other things being the same, greater velocities will be attained at higher altitudes than at low ones, the wind at higher altitudes being further removed from retardation by friction.

Though we are of opinion that no bridge or viaduct is likely to be built in such a situation as to expose it to wind pressures equal to those which have been occasionally indicated by the disc on the Bidston Observatory, yet even if that were possible, a bridge or viaduct constructed according to the rules we have given would not be subjected to strains nearly equal to its theoretical strength.

On the other hand, there will be many structures of small altitude or in sheltered situation which never can be exposed to the wind pressure we have assumed, and where the application of the rules we have given would require modification.

Some modification of the rules may also be required in the case of suspension of other bridges of very large span; but such cases will be of rare occurrence, and we recommend that they should be specially considered when they arise.

We have the honour to be,

SIR,

Your most obedient Servants,

JOHN HAWKSHAW.

W. G. ARMSTRONG.

W. H. BARLOW.

G. G. STOKES.

W. YOLLAND.

We, the undersigned, concur in the above Report so far as it goes; but we think the following clause should be added, *viz.* :—

The evidence before us does not enable us to judge as to the lateral extent of the extremely high pressure occasionally recorded by anemometers, and we think it desirable that experiments should be made to determine this question. If the lateral extent of exceptionally heavy gusts should prove to be very small, it would become a question whether some relaxation might not be permitted in the requirements of this Report.

W. G. ARMSTRONG.

G. G. STOKES.

*Extract from a letter dated 11th August 1880 from H. G. Calcraft, Esq. (Assistant Secretary, Railway Department, Board of Trade), to W. Airy, Esq. (Secretary to the Wind Pressure Commission), referred to in page 2 of the foregoing Report.*

"I am further to enclose a copy of the Report of the Select Committee on the North British Railway (Tay Bridge) Bill of the present session; and in drawing your attention to paragraph 8, in which the Committee refer to the question of providing shelter from the wind for trains passing over the bridge, to suggest for the consideration of the Committee that this point might be included in the scope of their inquiry."

*Paragraph 8 of the Report of the Select Committee on the North British Railway (Tay Bridge) Bill.*

"No provision for giving any shelter to the train from the wind during its passage over the bridge was included in the scheme before the Committee. This subject they consider most important, and it will no doubt receive the attention of the Company's Engineer in preparing plans for the reconstruction of the bridge.

*Summary of Strong Winds registered at Stations in England and Scotland where the pressures were measured directly by Osler's Self-registering Anemometers.*

GLASGOW.

The Osler anemometer is at a height of 40 feet above the ground, and 218 feet above mean sea level. It is placed on the top of the observatory, which stands on a hill of no great height on the outskirts of Glasgow, and it is fully exposed to the wind on the south and west,

though sheltered to some extent on the north and east by tall buildings and hills. The area of the pressure plate was at first 1·3 square feet, afterwards 1 square foot, and subsequently 2 square feet.

*Recorded Maximum Pressures up to or above 30 lbs. on the Square Foot from 1861 to 1873.*

Date.			Maximum Pressure in Lbs. per Sq. Foot.	Date.			Maximum Pressure in Lbs. per Sq. Foot.
1861—January	24	...	30	1862—October	19	...	33
February	2	...	38	"	27	...	36
March	6	...	45	December	15	...	30
"	8	...	40	"	18	...	42
"	17	...	47	1863—January	19	...	45
August	18	...	34	"	22	...	40
October	13	...	30	"	26	...	40
November	19	...	33	October	29	...	45
"	21	...	34	1864—February	13	...	40
"	24	...	42	1865—December	30	...	35
1862—January	9	...	38	1866—December	28	...	31
June	7	...	35	1868—January	24	...	40
July	19	...	35	April	29	...	32
October	17	...	40				

NOTE.—No pressures up to 30 lbs. recorded during the years 1869, 1870, 1871, 1872, 1873.

GREENWICH.

The anemometer is at a height of 56 feet above the ground, and 213 feet above mean sea level. It is placed on the top of the observatory, which stands on the brow of a hill breaking down very steeply towards the north. The exposure of the anemometer to the wind is complete and extremely severe. The area of the pressure plate during the years referred to in the table was 2 square feet.

*Recorded Maximum Pressures up to or above 25 lbs. on the Square Foot from 1872 to 1878.*

Date.			Maximum pressure in Lbs. per Sq. Foot.	Date.			Maximum Pressure in Lbs. per Sq. Foot.
1872—January	4	...	25·1	1873—November	27	...	30·0
"	5	...	*42·0+	1874—December	8	...	29·0
"	17	...	*42·0+	1875—January	24	...	30·0
"	18	...	30·0	"	25	...	*42·0+
"	23	...	*42·0+	June	12	...	25·0
"	24	...	30·0+	November	6	...	25·0
March	27	...	30·0	1876—March	12	...	25·0
"	28	...	*42·0+	"	15	...	35·0
November	26	...	*42·0+	1877—February	20	...	27·5
December	7	...	30·0	April	16	...	34·0
"	8	...	*42·0+	"	17	...	29·3
1878—January	4	...	35·0	November	11	...	32·6
"	18	...	31·0	1878—August	30	...	34·0

NOTE.—The instrument did not record pressures greater than 42 lbs. on the square foot. On those occasions when the pressure is marked thus (42·0+ in the above table, the plate was repeatedly forced back to the extreme limit of its range by the wind, and the maximum pressure was undoubtedly greater than 42 lbs. This was specially the case with the storm of December 8th, 1872, when from the violence of the back-lash indications of the pencil trace, there is reason for thinking that the maximum pressure must have exceeded 50 lbs., and probably approached 60 lbs. on the square foot.

ADDENDUM.—In the month of May 1880, the anemometer at the Greenwich Observatory was altered so as to record pressure somewhat greater than 50 lbs. per square foot, by the reduction of the area of the pressure plate from 2 square feet to 1½ square feet, and the anemometer was carefully adjusted and verified. On the 18th January 1881 an extremely violent gale from the east occurred, and the anemometer recorded pressures up to or greater than 50 lbs. per square foot four times during that storm. The highest pressure attained was 51½ lbs.

LIVERPOOL (BIDSTON).

The anemometer is at a height of 56 feet above the ground, and 251 feet above the mean sea level. It is placed on the top of the Bidston Observatory, which is situated on the top of a range of hills on the south side of the Mersey; these hills rise abruptly from the sea level on both sides, but specially on the west side. The exposure of the anemometer to the wind is complete and

remarkably severe. The area of the pressure plate was 4 square feet up to 1873, and was then reduced to 2 square feet.

*Recorded Maximum Pressures up to or above 45 lbs. on the Square Foot from 1868 to 1879.*

Date.	Maximum Pressure in lbs. per square foot.	Date.	Maximum pressure in lbs. per square foot.
1868—January 31st ... ..	51.2	1871—March 9th ... ..	80.0
February 1st ... ..	70.0	1872—November 6th ... ..	55.0
" 4th ... ..	49.0	December 9th ... ..	57.0
" 22nd ... ..	65.0	1874—January 2nd ... ..	50.5
March 6th ... ..	53.0	October 21st ... ..	50.0
April 21st ... ..	47.5	1875 January 20th ... ..	50.4
November 3rd ... ..	49.0	September 27th ... ..	70.0
December 27th ... ..	80.0	1877—January 30th ... ..	63.0
1869—January 31st ... ..	49.0	February 20th ... ..	45.5
February 27th ... ..	46.0	November 22nd ... ..	61.7
" 28th ... ..	45.0	" 23rd ... ..	63.5
March 1st ... ..	50.0	No pressures up to 45 lbs. recorded in the years 1878 and 1879.	
September 19th ... ..	45.0		
1870—September 10th ... ..	65.0		
October 13th ... ..	65.0		
" 19th ... ..	50.0		
" 20th ... ..	46.5		

**Method of deducing the maximum pressure of the wind during a storm from the maximum run of wind in any one hour during the same storm.**

At the stations of the Meteorological Office the actual run of the wind in miles is recorded from hour to hour throughout the day by a self-registering apparatus. But the pressures of the wind are not measured at those stations. In order to deduce the maximum pressures from the maximum runs of the wind in any one hour, it is necessary to have recourse to some good station where both of these sets of quantities have been measured. A table can then be formed giving the average relation which exists between the maximum pressure and the maximum runs of wind in any one hour at that station.

The station selected for the formation of such a table is the Bidston Observatory. This station is very suitable, both from the wide range of the velocities and pressures experienced, and from the care and order with which the observations have been recorded and published. The table has been formed from the published results of the Bidston observations from 1st January 1870 to 31st December 1878. The method of forming the table was as follows:—

As the object of the table was to deal with the higher velocities and pressures of the wind, no notice was taken of maximum hourly runs of the wind smaller than 35 miles in an hour. A first subsidiary table was then formed of all the maximum hourly runs of the wind lying between 35 and 45 miles in an hour with the maximum pressures corresponding: these were respectively added up and an average result obtained of a maximum pressure of 14.7 lbs. per square foot for a maximum hourly run of the wind of 40 miles. A second subsidiary table was then formed of all the maximum hourly runs of the wind lying between 45 and 55 miles in an hour with the maximum pressures corresponding, and an average result obtained as before. A third subsidiary table was then formed of all the maximum hourly runs of the wind lying between 55 and 65 miles in an hour with the maximum pressures corresponding. And so on to the highest velocities registered. The results obtained in this manner were as follows:—

Maximum hourly run of the wind in miles.	Maximum pressure in lbs. on the square foot.
40	14.7
50	23.7
60	33.9
70	48.0
80	65.5

On an examination of the above figures it is seen that the pressures are very nearly proportional to the squares of the velocities in every case; and that the simple formula  $\frac{V^2}{100} = P$  will serve with tolerable accuracy as the basis for the computation of a table connecting the maximum run of the wind in miles in any one hour (V) with the maximum pressure in lbs. on the square

foot (P) at any time during the storm to which (V) refers. The following table has been computed from the above formula :—

Table for converting maximum hourly runs of the wind into maximum pressures, calculated from the Formula  $\frac{V^2}{100} = P$ , where V = the maximum run in miles of the wind in any one hour, and P = the maximum pressure in lbs. on the square foot at any time during the storm to which V refers.

Maximum hourly run of the wind in miles.	Maximum pressure in lbs. on the square foot.	Maximum hourly runs of the wind in miles.	Maximum pressure in lbs. on the square foot.
40	16.0	71	50.4
41	16.8	72	51.8
42	17.6	73	53.3
43	18.5	74	54.8
44	19.4	75	56.2
45	20.2	76	57.8
46	21.2	77	59.3
47	22.1	78	60.8
48	23.0	79	62.4
49	24.0	80	64.0
50	25.0	81	65.6
51	26.0	82	67.2
52	27.0	83	68.9
53	28.1	84	70.6
54	29.2	85	72.2
55	30.2	86	74.0
56	31.4	87	75.7
57	32.5	88	77.4
58	33.6	89	79.2
59	34.8	90	81.0
60	36.0	91	82.8
61	37.2	92	84.6
62	38.4	93	86.5
63	39.7	94	88.4
64	41.0	95	90.3
65	42.2	96	92.2
66	43.6	97	94.1
67	44.9	98	96.0
68	46.2	99	98.0
69	47.6	100	100.0
70	49.0		

*Summary of Strong Winds registered at Stations in India.*

The pressure was in all cases measured directly by Osler's anemometers.

**BOMBAY.**

*Recorded Maximum Pressures up to or above 10 lbs. on the Square Foot, from 1849 to 1865.*

Date.	Maximum pressure in lbs. per sq. foot.	Date.	Maximum pressure in lbs. per sq. foot.
1849—June 21st	11.0	1856—May 21st	16.0
1850—Oct. 7th	11.0	"   30th	14.0
Nov. 1st	14.0	"   31st	11.0
1851—May 28th	10.0	June 1st	11.0
June 10th	11.0	1857   "   25th	10.0
July 11th	13.0	1858   "   24th	12.0
Aug. 1st	10.0	1859   "   3rd	11.0
1852—June 21st	10.0	July 16th	11.5
Aug. 1st	11.0	1860—June 14th	16.0
1854—Nov. 1st	11.0	Oct. 16th	16.0
"   2nd	38.0	1862—June 14th	10.7
1855—June 11th	10.5	1865   "   "   "   "	10.5

## CALCUTTA.

Recorded Maximum Pressures up to or above 10 lbs. on the Square Foot, from 1870 to 1877.

Date.	Maximum pressure in lbs. per sq. foot.	Date.	Maximum pressure in lbs. per sq. foot.
1870—Apl. 8th	18.0	1874—Mar. 8th	18.0
" 9th	40.0	Oct. 15th	12.0
1871—" 3rd	30.0	1875—May 2nd	11.0
May 7th	19.5	" 9th	34.0
" 25th	22.0	" 12th	14.0
" 26th	11.4	" 17th	18.0
1872—Apl. 1st	12.0	" 24th	34.0
" 4th	10.0	" 26th	13.5
" 23rd	11.2	" 27th	12.0
May 18th	11.8	June 1st	10.2
1873—Apl. 28th	30.4	July 14th	11.2
May 3rd	10.3	1876—Mar. 16th	20.0
" 4th	25.0	Nov. 1st	14.0
" 24th	11.0	1877—Mar. 17th	40.0

## DODABETTA.

An exposed station on the top of the Nilgherry Hills, 8,640 feet above the level of the sea.

Recorded Maximum Pressures up to or above 25 lbs. on the Square Foot, from 1847 to 1854.

Date.	Maximum pressure in lbs. per sq. foot.	Date.	Maximum pressure in lbs. per sq. foot.
1847—April 17th	*35.0+	1849—June 18th	26.0
May 24th	28.5	" 22nd	28.0
June 12th	30.0	July 25th	29.0
July 25th	27.0	" 29th	28.0
" 26th	32.0	" 30th	27.5
Sept. 5th	27.5	" 31st	30.5
" 8th	28.0	1851—May 3rd	36.0
" 9th	28.0	June 9th	28.0
" 10th	*35.0+	" 10th	32.0
" 30th	27.0	" 11th	27.0
1848—April 26th	26.0	July 30th	32.0
June 2nd	29.0	" 31st	38.0
" 11th	29.0	August 1st	37.0
" 13th	34.0	1852—June 21st	25.0
" 14th	29.0	" 24th	33.0
" 17th	30.2	1853—March 27th	40.0
" 18th	26.0	1854—July 14th	26.5
July 19th	25.5	" 17th	27.0
1849—June 17th	34.5		

\* The anemometer did not at these times record pressures greater than 35 lbs. No explanation is given concerning the pressures of 36 lbs. and 40 lbs. in the latter part of the table, and it is possible that the instrument may have been altered so as to record pressures higher than 35 lbs.

## MADRAS.

Recorded Maximum Pressures above  $\frac{1}{2}$  lb. on the Square Foot, from 1841 to 1851.

Date.	Maximum pressure in lbs. per sq. foot (partly estimated).	Date.	Maximum pressure in lbs. per sq. foot (partly estimated).
1841—April 29th	8.1	1846—October 20th	*16.9
May 15th	12.2	November 24th	8.4
" 16th	17.1	" 25th	*33.8
1842—May 30th	7.6	1847—October 13th	15.7
June 17th	7.5	December 12th	7.6
July 24th	6.9	" 13th	7.7
October 23rd	17.2	1848—March 3rd	11.0
" 24th	16.0	May 1st	7.5
1843—May 20th	7.6	November 1st	8.7
" 21st	9.7	1850—May 23rd	15.6
November 30th	7.3	1851—May 3rd	7.8
December 1st	7.9	" 4th	22.7
1844—May 8th	6.6		
December 25th	6.6		
1845—May 24th	7.9		

\* On these occasions the instrument failed to perform, and it is possible that the maximum pressures were even higher.

Notes.—The published pressures in the Madras tables give the average force of the wind reckoned during 10 minutes before, and 10 minutes after each hour. The maximum of such published pressures has been increased 80 per cent. in the above table to obtain the probable maximum pressure of the day, this being, on an average, the proportion which existed in the Dodabetta observations, where both the average pressures and the maximum pressures are given.



*List of Accidents to Railway Trains caused by the force of the Wind.*

## ENGLAND.

In September 1855 a goods and cattle train which was being run from Preston to Carlisle was brought to a stand by wind pressure on the Shap Bank, for about 20 minutes, and then three empty cattle wagons and three empty sheep vans, next to the engine, were blown over on their sides.

On the 5th January 1867 the 8.20 P.M. local mail train from Holyhead, consisting of two engines, breakvan, post-office van, three carriages, a guard's van, and a truck, came to a stand on a high embankment about two miles from the Aber station, on the Chester and Holyhead line, owing to the snow and the force of the wind. Just afterwards the coupling chain between the second engine and the first break-van separated, and a few minutes later the breakvan and the post-office tender were turned over on their sides.

On the 11th April 1876 the down night Irish mail, consisting of an engine and twelve vehicles, and on the 11th August, of the same year, the up night Irish mail train, consisting of an engine and 14 vehicles, were stopped dead by wind-pressure on the Chester and Holyhead Railway, between Gaerwen and Bodorgan, on what is known as the Llangaffo Bank, the gradient being 1 in 100.

About six years ago (*i.e.*, about 1874), exact date unknown, the down night Irish mail train was brought to a stand on the Llangaffo Bank by wind pressure, and also on the Llandulas Bank, between Abergele and Colwyn, on the Chester and Holyhead line, from the same cause. In the latter instance the train had to be divided and taken up the incline (the gradient of which is 1 in 100) in two parts.

In 1865, on the Festiniog railway, the gauge of which is 1' 11½", a van with not more than one cwt. of luggage in it was blown over on an embankment. The speed was about 12 miles an hour, upon a slight curve, the inner rail being ½" lower than the outer rail; the difference of level aiding the fall of the van.

## INDIA.

On the 5th October 1864 on the Eastern Bengal Railway two trains were upset during a violent storm. One of these was a train of eight passenger vehicles and was upset near Echapore. The other was a train of 12 passenger vehicles and was upset near Arrunghatta. In both cases all the passenger vehicles were blown over on their sides. Besides these cases four wagons were blown from a siding at Baggoolah, and capsized about half-a-mile north of that station on the same day. Other accidents happened on the same day from collisions caused by wagons which were started from sidings by the force of the wind.

On the 21st September 1878, a long train of wagons travelling at about eight miles per hour, on the Eastern Bengal Railway was brought to a standstill by a heavy storm and was then forced back about a mile with full steam and brake against it; eighteen wagons were then detached, but even with half the train it was found difficult to continue the journey.

On the 21st November 1880, at Negapatam, on the South Indian Railway, an empty covered goods wagon was upset by the wind while standing at rest in a siding.

Numerous instances have occurred on the Indian Railway of trains being stopped, or nearly so, by the force of the wind.

## NEW ZEALAND.

On the 11th September 1880, on the Rimutaka incline a train was blown over while crossing a gully which entered the main valley at right angles. The gauge of the railway is 3' 6", and the incline was worked by a Fell engine, which was situated in the middle of the train, having two passenger vehicles and a guard's van in front of it, and two luggage vans and an incline brakevan behind it. The carriages and van in front of the engine were first blown over: the front carriage went to pieces and the passengers in it were mostly killed; the other carriage and the van hung to the engine by the couplings. The goods vans and the other brakevan behind the engine retained their position on the rails for a minute or two, and then the goods vans were blown over.

## FRANCE.

Five trains have been upset by the wind of the railway from Perpignan to Narbonne, between 1860 and 1868, as follows:—

On the 27th February 1860 a passenger train of six carriages, travelling at a speed of about 15 kilometres an hour, was blown off the line and rolled down the embankment. On the same day a luggage train was blown off the rails near Rivesaltes; six empty wagons were turned over, and dragged with them a loaded wagon; four trucks loaded with iron goods and three loaded wagons were not upset.

On the 19th January 1863 16 empty wagons standing on a siding at the station of Leucate were upset by the wind.

On the 11th February 1865 11 goods wagons standing on the same siding at Leucate were upset by the wind.

On the 5th December 1867 a passenger train travelling at a speed of about 30 kilometres an hour, and consisting of an engine and seven vehicles, one of which was a brakevan, was upset by the wind. All the carriages were thrown over, but the brakevan, which was heavier, merely left the rails.



## APPENDIX F.

Statement showing the extent of the employment of Natives as Engine Drivers and Shunters on Guaranteed and State Railways during 1880.

Railways.	NUMBER EMPLOYED.		Observations of Railway Administrations.	Remarks.
	Engine Drivers and Shunters.	Firemen, &c.		
East Indian Railway	227	760	<p>The further extension of the movement has for a time become somewhat limited on account of the want of education amongst the oldest classes of the native shunters and firemen. This obstacle to progress was anticipated as far back as 1876, when inducements were held out to the men to attend school after work hours. Finding that something further was required, departmental schools were introduced in 1877, and promotion to the grade of native fireman was made subject to the men attending school and showing some progress in one or other of the native languages. There are now 18 departmental schools established for this purpose, and the average daily attendance is about 400 men.</p> <p>Native firemen have been working on goods trains for the last 15 years; and the fact of no less than 760 men being on the staff at the present time is sufficient to prove that their employment is a success. As far as carefulness of their engines is concerned, it has been found that natives are as careful in that respect as Europeans with a similar length of service on the footplate.</p> <p>During the 6 years ending with 1880 a saving of about Rs. 15,95,924-8-10 has been effected. In ballast train drivers' wages a saving is now effected in this department of nearly Rs. 2,000 per month, or Rs. 24,000 annually. This represents the saving resulting from replacing only six European drivers by natives on the following districts, <i>viz.</i>, Howrah yard, Rampore Haut, Sahibgunge, Jumalporc, Allahabad (with Jubbulpore line), and Cawnpore. The cost in drivers' wages, overtime and allowance to these districts prior to native drivers being put in charge of the trains in April 1880 amounted to Rs. 2,140 per month, and it has now been reduced to Rs. 220 a month, showing a clear gain of 90 per cent.</p> <p>It has never been contemplated to work ballast trains with native guards, so that there is no drawback to the abovementioned savings by the substitution of native drivers.</p>	
Madras Railway	...	...	<p>The number of drivers working the trains now is less than the number on the books five years ago, and arrangements are in progress for the gradual introduction of native drivers; but it will be several years before any considerable number can be had, as those who have sought employment as firemen are not sufficiently intelligent ever to make drivers.</p>	
South Indian Railway	20	...	<p>Principally engaged doing shunting, driving special goods trains, and in some cases passenger trains on branch lines. It is impossible to get a better or educated class of natives to join the service, so as to become engine drivers; and even if they are willing, they are not physically capable of carrying out the duties necessary for an engine driver. Their caste prejudices interfere in many ways. The great drawback is want of education. Recruiting of European and Eurasian firemen has been stopped, and encouragement has been given to the best native firemen to qualify for drivers.</p>	
Great Indian Peninsula Railway.	39	60		

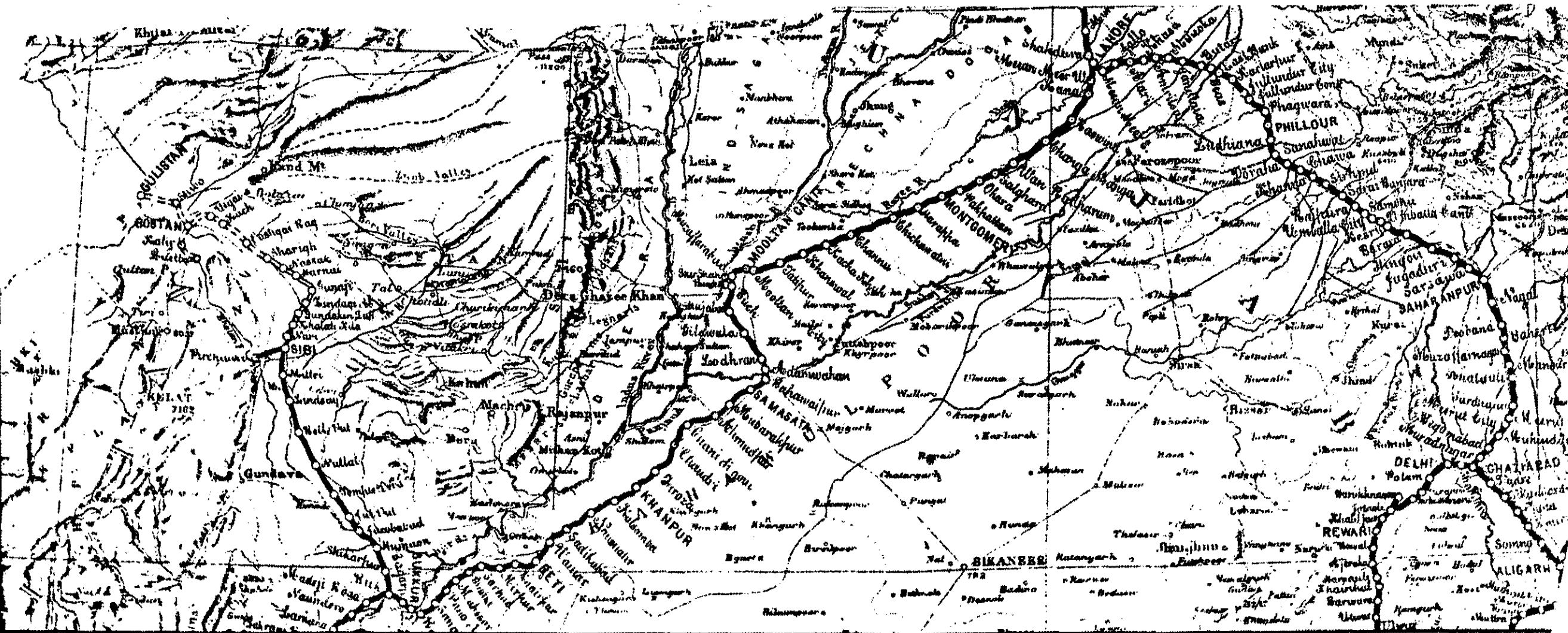
## Statement showing the extent of the employment of Natives, &amp;c.—continued.

Railways.	NUMBER EMPLOYED.		Observations of Railway Administrations.	Remarks.
	Engine Drivers and Shunters.	Firemen, &c.		
Bombay, Baroda and Central India Railway.	8	...	In addition to these, there are 2 West Indians, 9 Eurasians, 7 Portuguese, and 5 Parsees.	
Eastern Bengal Railway.	...	...	There are no natives in charge of locomotive engines at present. There are 18 European and Eurasian main line drivers and 9 shunters. It is considered absolutely necessary to adhere to the present system of employing Europeans and Eurasians as shunters.	
Oudh and Rohilkhand Railway.	57	...	Of the number noted, 26 were employed as drivers and 31 as shunters. The saving by employing the 26 drivers is Rs. 4,082 per month. Their working is reported as having been satisfactory, as they have been attentive and have given little cause of complaint. In cases of breakdowns also, they have on every occasion done creditably. Their education in English and the vernacular is, however, not so far advanced as is desirable; but the men feel the necessity of improving themselves in this direction, and are educating themselves in their spare time.	
Sind, Punjab and Delhi Railway.	38	191	In addition to the number shown, some 300 natives were employed in various capacities about the running sheds, a proportion of whom in time no doubt will be eligible as material to use on engines. The two men named drivers are employed on the Gazeabad and Delhi Branch, and do their work very satisfactorily.	
Northern Bengal State Railway.	3	4	.....	
Tirhoot and Patna-Gya Railways.	2	...	One man is employed as a shunter to work the engine that takes the trains from Bazidpur to the Ghat, 7 miles, in order to save driver's overtime. He has done very well and has had no accidents. The other man does all the shunting in the Somastipur yard, and was appointed in place of a European dispensed with. He also runs goods trains when required.	
Calcutta and South-Eastern.	4	3	All the drivers and shunters employed on both lines are natives. The speed on these lines is slow and traffic small. The native drivers have so far given satisfaction. They are not so economical in fuel as Europeans, but there is considerable saving in cost of establishment.	
Nalhati State Railway	8	3		
Muttra-Hathras Railway.	4	...	One driver was promoted from fireman, 2 other drivers had been running for some years, and one new man was obtained who had been a driver. All natives. Their work has been generally satisfactory.	
Cawnpore and Farukhabad Railway.	...	...	Was not open for public traffic in 1880.	
Dildarnagar and Ghazipur and Sindia State Railways.	...	...	The Sindia State Railway is worked by European as well as native drivers with native firemen. The Dildarnagar branch was mostly worked by a European driver with 2 native firemen. The necessary arrangements for working entirely with native staff is not yet completed.	
Nizam's State Railway.	...	...	The full complement of drivers, including two Parsees, are employed. It is difficult, if not impossible, to procure native drivers.	
Bhavnagar-Gondal Railway.	...	...	Nothing has been done in the way of training natives as drivers and shunters.	
Rangoon and Irrawaddy Valley State Railway.	4	50	Natives of India or Burma are not employed as drivers, except upon suburban lines, in Rangoon. All first and second class firemen employed on this line are natives of India. Four natives of India are employed in driving and shunting, and 50 first and second class firemen.	

APPENDIX F.

Statement showing the extent of the employment of Natives, &c.—concluded.

Railways.	NUMBER EMPLOYED.		Observations of Railway Administrations.	Remarks.
	Engine Drivers and Shunters.	Firemen, &c.		
Punjab Northern State Railway.	2		Employed as shunters; but owing to their defective knowledge of reading and writing, they are not qualified to be employed on the main line.	
Indus Valley State Railway.	11		Employed in shunting. It is under contemplation to run the whole Sibi-Ruk service with native drivers.	
Rajputana Railway ...			A statement is furnished to August 1881 showing that there are 4 native drivers and 15 shunters. On the whole, the performance of the 4 drivers may be deemed satisfactory. The shunters also work well, and 2 or 3 are recommended to work branch trains by their district officers. The advancement of native drivers is deemed slow. On the whole of the line there are but 4 men deemed capable of working trains. In time the gradual advancement of native firemen and shunters to drivers will increase. There is an advantage in employing them wherever a suitable man can be found.	
Molkar and Sindia-Neemuch Railway.		1	One native apprentice fireman was appointed on these lines in September 1880. Another native apprentice fireman was entertained in February 1881. Both have worked satisfactorily and have been favorably reported on. Owing to slackness of traffic, more men of this class have not been engaged.	



Administration Report 1880-81.

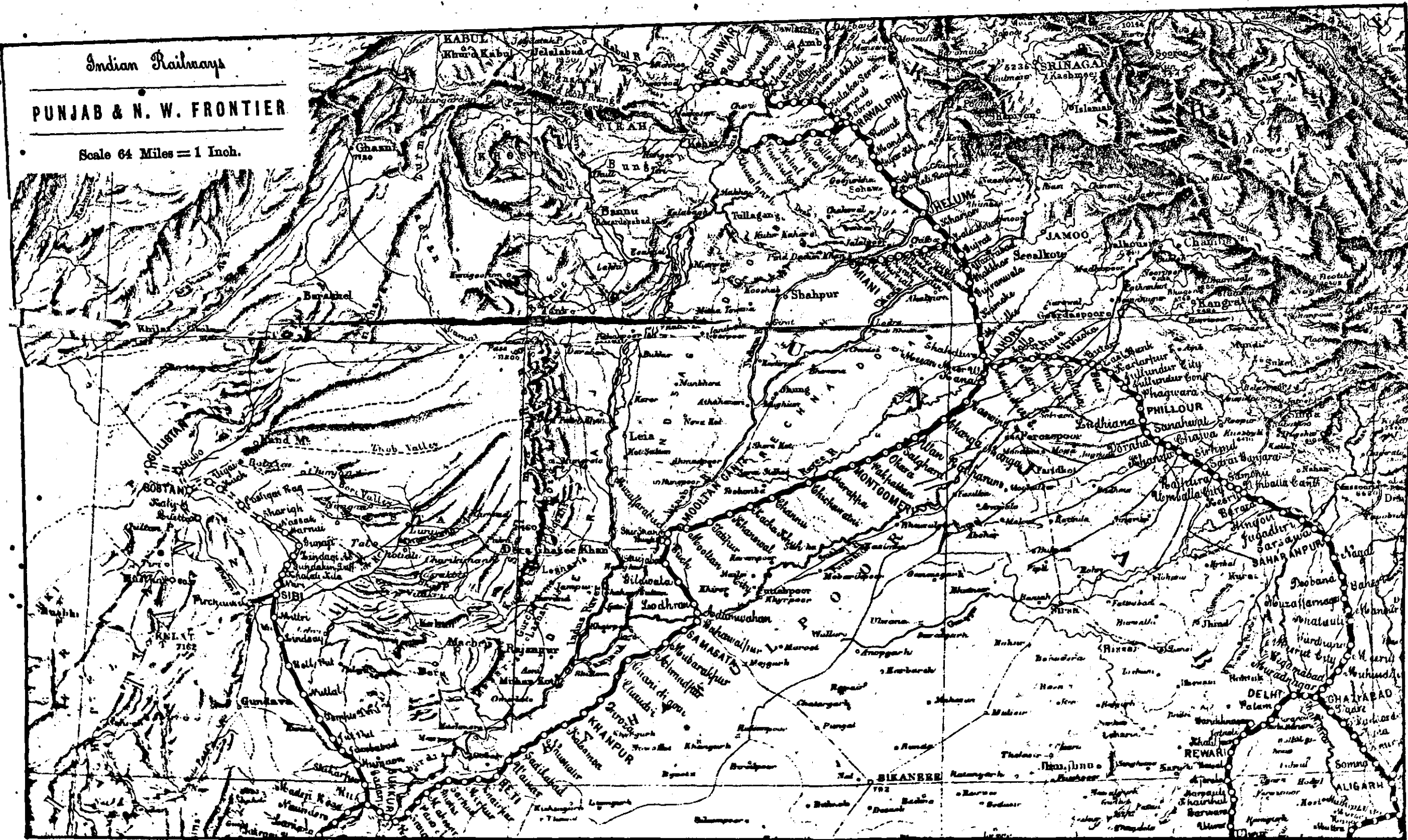
Note.—5 ft. 6 in. gauge, shown black. Metre gauge, red.

Photographed at the Survey General's Office, 1881.

Indian Railways

PUNJAB & N. W. FRONTIER

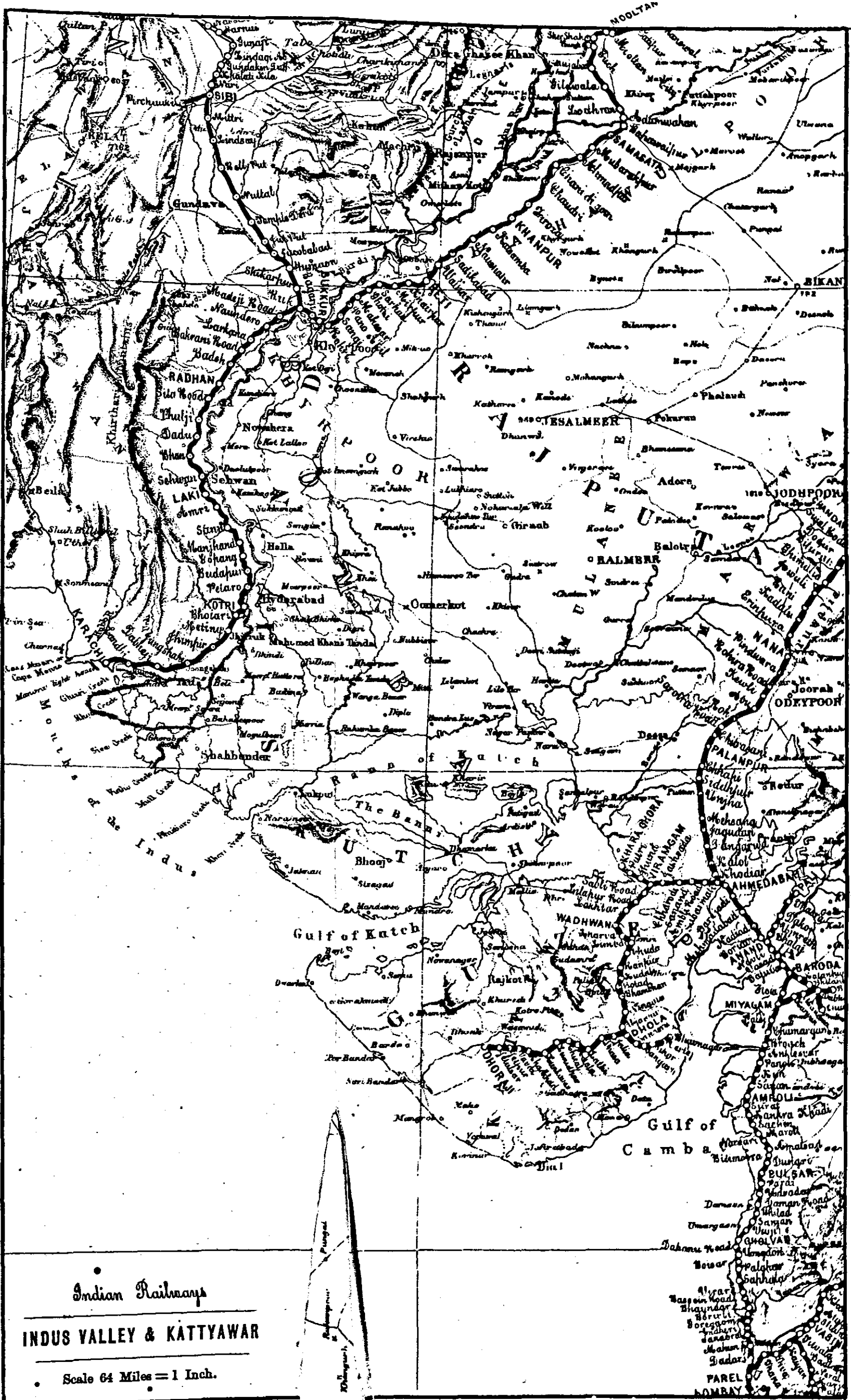
Scale 64 Miles = 1 Inch.



Administration Report 1880-81.

Note.—5 ft. 6 in. gauge, shown black. Metro gauge, red.

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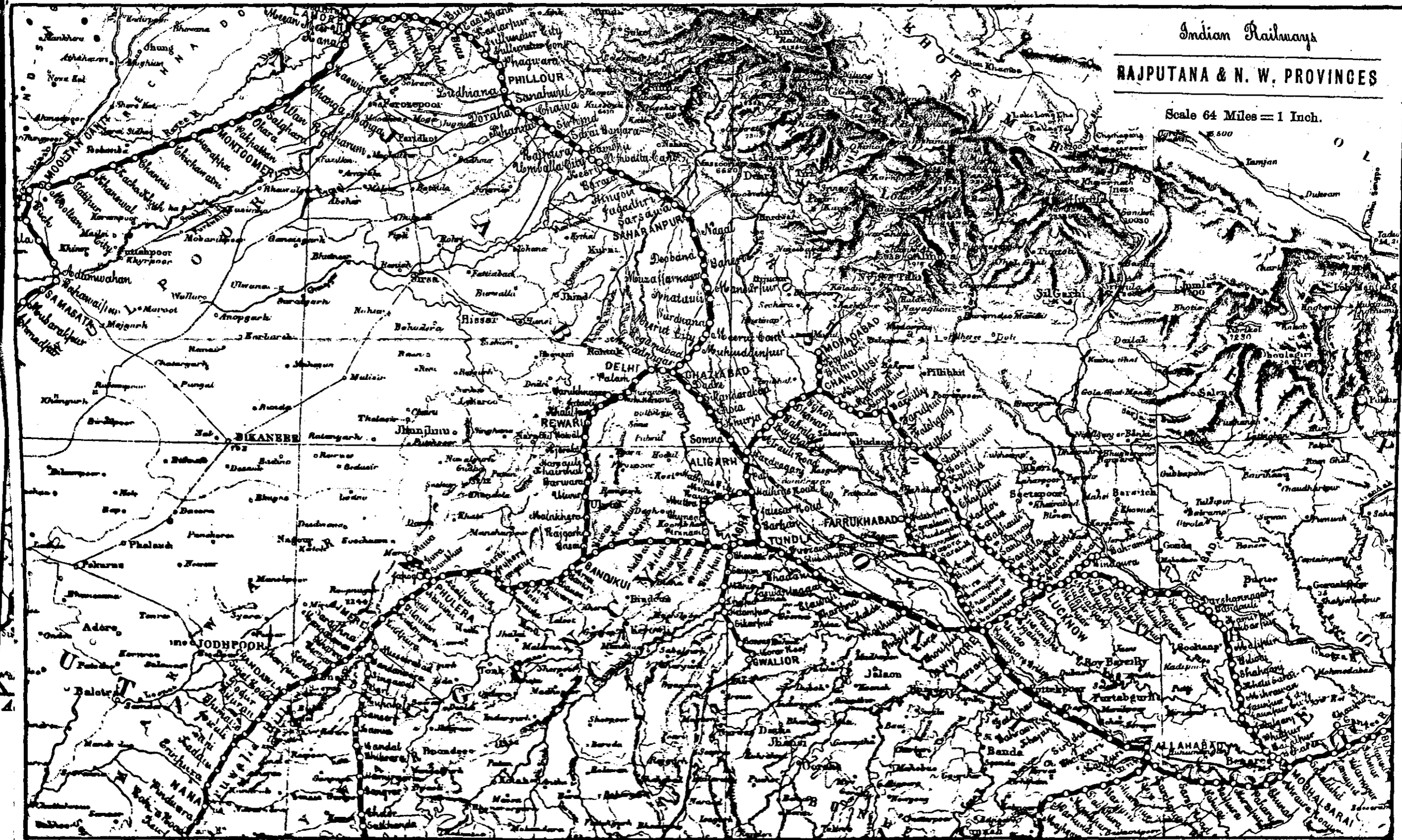




Indian Railways

RAJPUTANA & N. W. PROVINCES

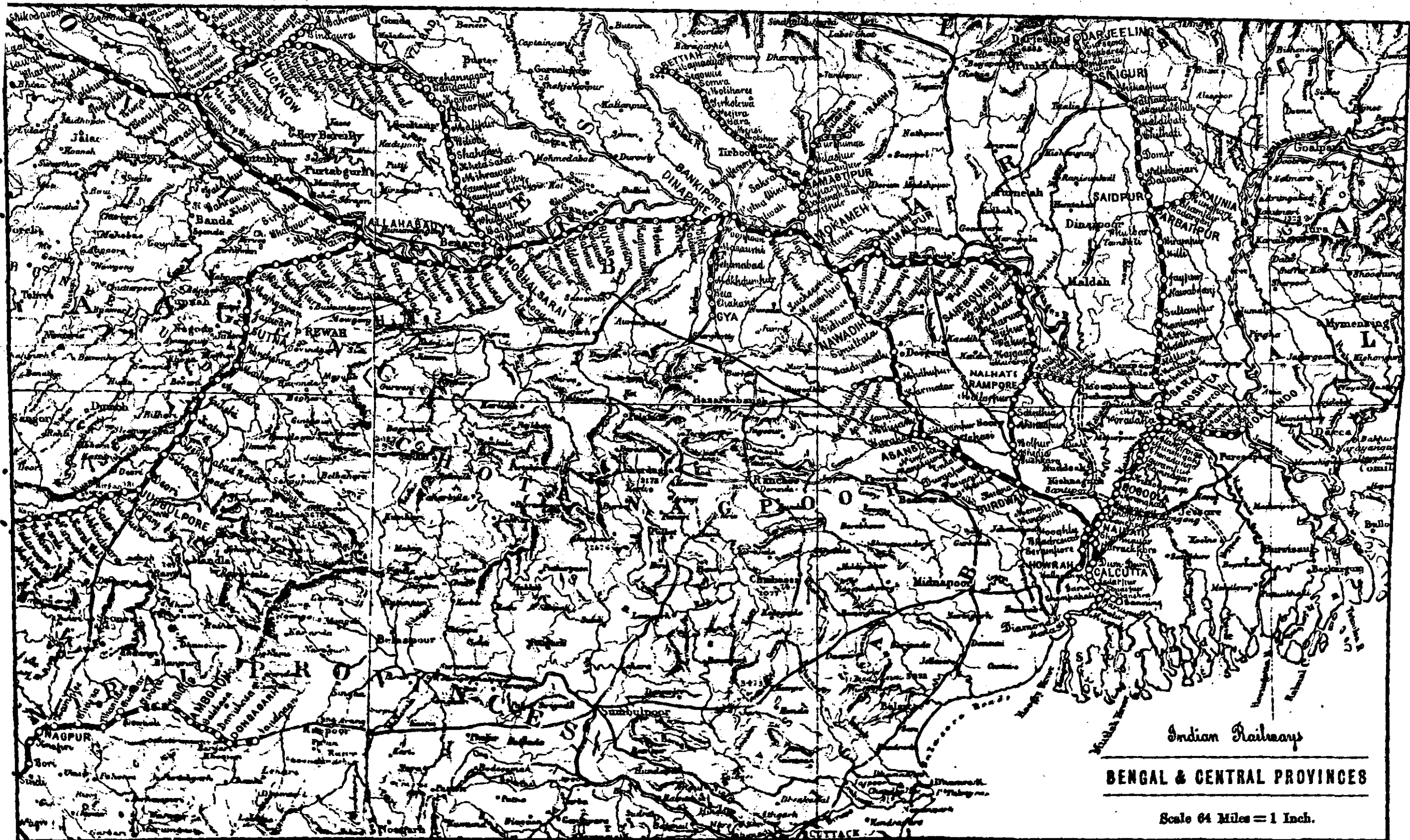
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Administration Report 1880-81.

Note.—5 ft. 6 in. gauge, shown black. Metre gauge, red.

Photographed at the Surveyor General's Office, Calcutta.



Administration Report 1880-81.

Note.—5 ft. 6 in. gauge, shown black. Metre gauge, red.

Photographed at the Surveyor General's Office, Calcutta.







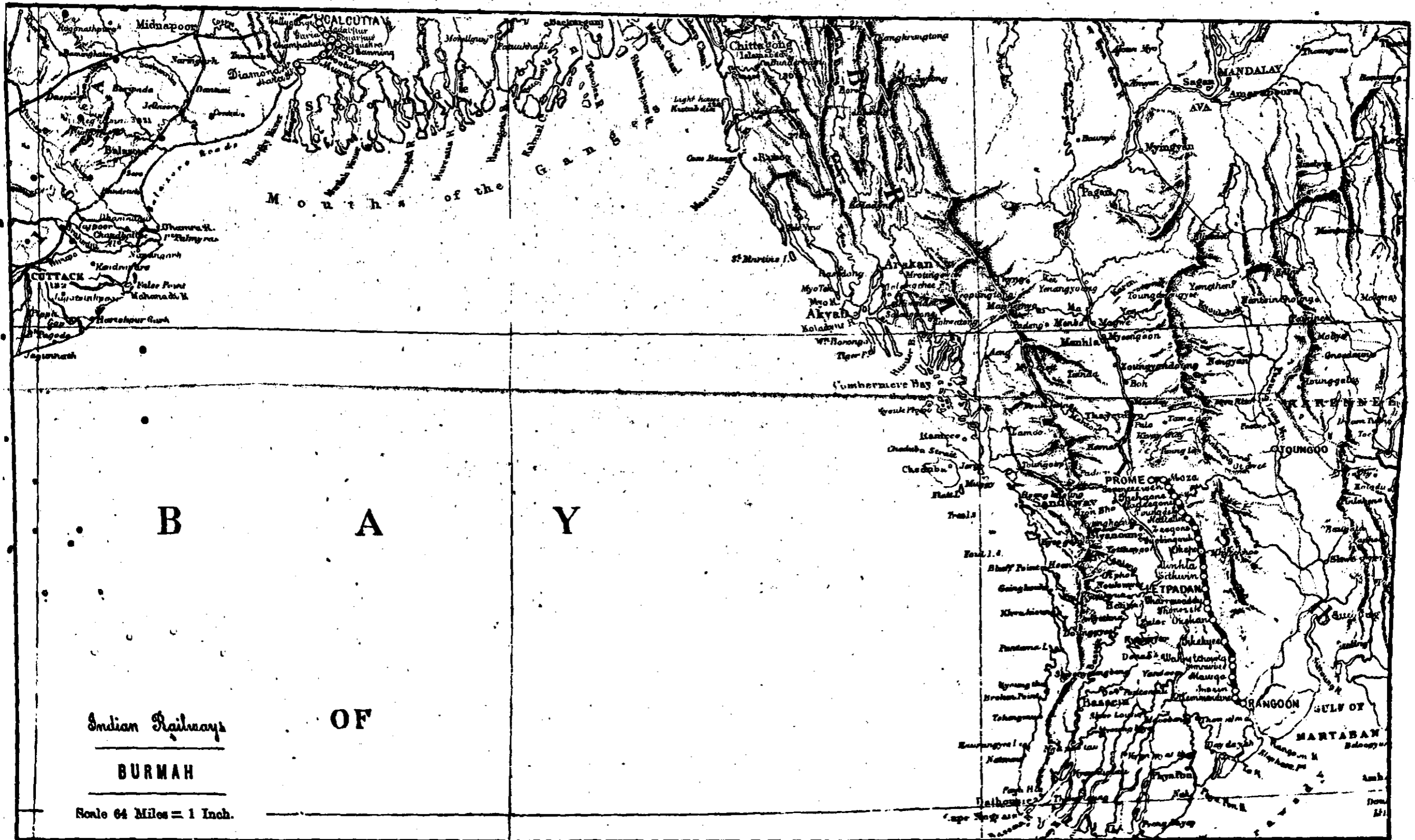
Indian Railways

**MADRAS & SOUTHERN INDIA**

Scale 64 Miles = 1 Inch.

Administration Report 1880-81.

Photographed at the Survey General's Office, Calcutta.



Administration Report 1880-81.

*Note.—5 ft. 6 in. gauge, shown black. Metre gauge, red.*

Photographed at the Surveyor General's Office, Calcutta