

RAILWAY DEPARTMENT
GOVERNMENT OF INDIA
RAILWAY BOARD

Railways in India

Administration Report for the year

1920-21



VOLUME I
(REPORT)

SIMLA
GOVERNMENT CENTRAL PRESS
1922

Price Rs. 3/8/-

**Agents for the sale of books published by
The Superintendent of Government Printing, India, Calcutta.**

Agents in Europe.

CONSTABLE & Co., 10, Orange Street, Leicester Square, London, W.C.
KEGAN PAUL, TRENCH, TRÜBNER & Co., 68-74, Carter Lane, E.C., and 89, New
Oxford Street, London, W.C.
BERNARD QUARITCH, 11, Grafton Street, New Bond Street, London, W.
P. S. KING & SONS, 2 & 4, Great Smith Street, Westminster, London, S.W.
H. S. KING & Co., 65, Cornhill, E.C., and 9, Pall Mall, London, W.
GRINDLAY & Co., 54, Parliament Street, London, S.W.
LUZAC & Co., 46, Great Russell Street, London, W.C.
W. THACKER & Co., 2, Creed Lane, London, E.C.
T. FISHER UNWIN, LTD., 1, Adelphi Terrace, London, W.C.
WHELDON & WESLEY, LTD., 28, Essex St., London, W.C.
B. H. BLACKWELL 50 & 51, Broad Street, Oxford.
DEIGHTON BELL & Co., LTD., Cambridge.
OLIVER & BOYD, Tweeddale Court, Edinburgh.
E. PONSONBY, LTD., 116, Grafton Street, Dublin.
ERNEST LEROUX, 28, Rue Bonaparte, Paris.
MARTINUS NIJHOFF, The Hague, Holland.

Agents in India and Ceylon.

THACKER, SPINK & Co., Calcutta and Simla.
NEWMAN & Co., Calcutta.
R. CAMBRAY & Co., Calcutta.
S. K. LAHIRI & Co., Calcutta.
B. BANERJEE & Co., Calcutta.
THE INDIAN SCHOOL SUPPLY DEPOT, 309, Bow Bazar Street, Calcutta, and 226,
Nawabpur, Dacca.
BUTTERWORTH & Co. (INDIA), LTD., Calcutta.
RAI M. C. SARCAR BAHADUR & SONS, 90/2A, Harrison Road, Calcutta.
THE WELDON LIBRARY, 57, Park Street, West, Calcutta.
STANDARD LITERATURE COMPANY, LTD., Calcutta.
LAL CHAND & SONS, Calcutta.
ASSOCIATION PRESS, Calcutta.
HIGGINBOTHAM & Co., Madras.
V. KALYANARAMA IYER & Co., Madras.
G. A. NATESAN & Co., Madras.
S. MURTHY & Co., Madras.
THOMPSON & Co., Madras.
TEMPLE & Co., Madras.
P. R. RAMA IYER & Co., Madras.
VAS & Co., Madras.
E. M. GOPALAKRISHNA KONE, Madura.
THACKER & Co., LTD., Bombay.
D. B. TARAPOREVALA, SONS & Co., Bombay.
MRS. RADHABAI ATMARAM SAGOON, Bombay.
SUNDER PANDURANG, Bombay.
GOPAL NARAYAN & Co., Bombay.
RAMCHANDRA GOVIND & SON, Kalbadevi, Bombay.
PROPRIETOR NEW KITABKHANA, Poona.

SERVANTS OF INDIA SOCIETY'S
BRANCH LIBRARY
BOMBAY

THE STANDARD BOOKSTALL, Karachi.
 MANGALDAS HARKISANDAS, Surat.
 KARSANDAS NARANDAS & SONS, Surat.
 A. H. WHEELER & Co., Allahabad, Calcutta and Bombay.
 N. B. MATHUR, SUPT., Nazir Kanun Hind Press, Allahabad.
 MUNSHI SEETA RAM, Managing Proprietor, Indian Army Book Depôt, Jubi,
 Cawnpore.
 RAI SAHIB M. GULAB SINGH & SONS, Mufid-i-Am Press, Lahore and Allahabad.
 RAMA KRISHNA & SONS, Lahore.
 SUPT., American Baptist Mission Press, Rangoon.
 MANAGER, the "Hitavada," Nagpur.
 S. C. TALUKDAR, Proprietor, Students & Co., Cooch Behar.
 A. M. & J. FERGUSON, Ceylon.
 MANAGER, Educational Book Depôts, Nagpur and Jubbulpore.*
 MANAGER of the Imperial Book Depôt, 63, Chandney Chauk Street, Delhi.*
 MANAGER, "The Agra Medical Hall and Co-operative Association, Ltd." (Successors
 to A. JOHN & Co., Agra).
 SUPT., Basel Mission Book and Tract Depository, Mangalore.*
 P. VARADACHARY & Co., Madras.*
 RAM DAYAL AGARWALA, 184, Katra, Allahabad.*
 D. C. ANAND & SONS, Peshawar.*
 MANAGER, Newal Kishore Press, Lucknow.*
 MAUNG LU GALE, Proprietor, Law Book Depôt, Mandalay.*

Books and Technical Papers published by the Railway Board.

BOOKS.

- (1) Administration Report on the Railways in India. Published yearly. Price—Vol. I, Report, Rs. 1-8 Volume II, Appendices, Rs. 2-4.
- ✓ (2) Classified List and Distribution Return of Officers of all Indian Railways. Published half-yearly. Price Re. 1.
- ✓ (3) History of Indian Railways, constructed and in progress corrected up to 31st March 1918. Published quinquennially. Price Rs. 1-8.
- ✓ (4) History of Services of the Officers of the Engineer and Superior Revenue Establishment of State Railways. Published yearly. Price Rs. 2-8.
- (5) Pocket Edition of the schedule of dimensions to be observed on all 5' 6", 3' 3½" and 2' 6" gauge railways in India. *Out of print, a new edition will be issued as soon as possible.*

TECHNICAL PAPERS.

- (6) Over 200 papers have been published by the Technical Section of the Railway Board's office. The papers comprise—
- (a) Original descriptions of Railway Works and studies of railway problems in India and elsewhere.
 - (b) Reprints of articles from Foreign Engineering Magazines.
 - (c) Reprints or abstracts of reports received by the Government of India on subjects connected with Railways.

A complete list of the papers can be obtained *gratis* from the Chief Engineer with the Railway Board, Simla.

The prices of the papers vary from Annas Four to Rupees Eight.

The books and papers can be bought from the Superintendent, Government Printing, India, 8, Hastings Street, Calcutta.

* Agents for the sale of Legislative Department publications only.



RAILWAY DEPARTMENT
GOVERNMENT OF INDIA
RAILWAY BOARD

Railways in India

Administration Report for the year
1920-21



VOLUME I
(REPORT)

SIMLA
GOVERNMENT CENTRAL PRESS
1922

PREFACE.

IN presenting this report of the Administration of Railways for the year 1920-21, the Railway Board wish to draw attention to an important change from the procedure hitherto adopted. The reports for previous years have consisted of a general survey of the more important events of the year affecting the railway position in India supplemented by a volume of statistical information of working of the lines concerned. The whole publication, though containing matters of great interest to those who were in a position to weigh and appreciate the value of the results exhibited, was perhaps hardly suited as a medium for conveying to the public a true appreciation of the railway position in India and the important significance attaching to the statistical results of working.

2. With the growth of public interest in this matter the Railway Board have, therefore, considered it desirable to alter the form of the first volume so as to make it both a record of the principal events of the year and an explanatory medium of the existing position in the light of the results detailed in the succeeding volume. Each chapter of Volume I, therefore, corresponds to an appendix or group of appendices in Volume II quoted in the heading and includes a short explanation or survey of the existing position supplemented by a summary bringing together in a convenient form the main or more important facts to be deduced from the figures together with a brief reference to relevant events of the year under review.

3. Apart from this change there is one other new feature which may be mentioned. A short introductory chapter has been added giving a brief review of the outstanding facts of the trade, agricultural and shipping position on which railway working so greatly depends, and it is hoped that the facts therein exhibited will be of assistance to the student of railway working in assigning a true value to the results attained.

4. In the pocket inside the back cover of this volume will be found three maps :—

- (i) The special map referred to under the head "Open Line Improvements."
- (ii) A general map of India showing railways open and under construction on the 31st March 1921.
- (iii) A map of railway systems in India, Burma and Ceylon, showing each system in a distinctive colour, prepared by Mr. J. H. Trótt.*

* *Map of Railway Systems in India, Burma and Ceylon by Mr. J. H. Trótt.*—This additional map is included only in copies of the report used for official purposes. It may be obtained by the public, on payment, from Mr. J. H. Trótt, Aligarh, United Provinces, who holds the copyright.

Note on Indian Currency.

For the information of foreign readers of this report who are unaccustomed to the use of Indian currency and units, it may be mentioned that Rs. 1,00,000 is usually referred to colloquially as "a lakh of rupees." Similarly, 100 lakhs constitutes "a crore."

In previous reports when the standard rate of exchange was Rs. 15 to the pound sterling the lakh was equivalent to £6,666 and a crore to £666,666. With effect from the beginning of the official year 1920-21, as proposed by the Currency Commission the standard rate of exchange has been fixed at Rs. 10 to the pound sterling, and at this rate the "lakh" is the equivalent of £10,000 and the "crore" as 1 million sterling.

An anna is a 16th part of a rupee and a pie the 12th of an anna.

CONTENTS.

	PAGE.
INTRODUCTORY REVIEW OF TRADE POSITION :—	
Extent of imports and exports	1
Noticeable features of import and export trade	1
Trade depression	1
Agricultural position	2
Shipping position	2
CHAPTER I.	
LINES OPEN, UNDER CONSTRUCTION AND PROJECTED :—	
Open Mileage	3
Tracks	4
Gauges	5
Ownership	5
Working Agencies	6
New Lines opened	8
Lines under construction	9
Projected Lines	10
Branch Line Terms	11
CHAPTER II.	
CAPITAL RAISED AND EXPENDED :—	
Capital Liability	12
Methods of discharging liability	12
Capital Expenditure	13
Open line facilities	13
Quadrupling and doubling of lines	14
Remodelling of yards	14
Staff quarters, etc.	14
Projected Open Line Works	15
Replacement of lines dismantled	15
CHAPTER III.	
ROLLING-STOCK :—	
Inadequacy of Rolling-stock	17
Traffic facilities to handle stock	17
Numbers of Rolling-stock	17
Arrangements for supply of stock	18
Financial Aspect	19
Diversion of Wagons to Coal Areas	19
Standard of Conveniences	20
CHAPTER IV.	
WORKING EXPENSES :—	
Increase in expenses	21
Main heads of expenditure	22
Expenditure on maintenance of way, works, etc.	22
Expenditure by Locomotive, Carriage and Wagon Departments	23
Traffic expenses	23
Factors affecting expenses on various lines	23
Relative importance of main avenues of expenditure	24
Maintenance of property	24
Fuel	26
Oil Fuel	27
Cost of Fuel	27
Railway Collieries	27
Inferior coals	28
CHAPTER V.	
RAILWAY STAFF :—	
Number of Staff	29
Improvements in pay and prospects	29
Grain shops	30
Provident Fund and gratuity benefits	30
Other indirect benefits	31
Strikes	31
Superior Staff	31
Mechanical Training	32

CHAPTER VI.

EARNINGS :—

Total Gross Earnings	...	...	...	...	33
Growth of Earnings	...	...	...	...	33
Goods Traffic earnings	...	...	...	...	34
Passenger Traffic earnings	...	...	...	...	34
Phenomenal growth of passenger traffic	...	...	...	...	35
Relative importance of goods traffic earnings	...	...	...	...	35
Earnings per mile per week	...	...	...	...	36
Analysis of goods traffic	...	...	...	...	36
Merchandise	...	...	...	...	37
Coal Traffic	...	...	...	...	37
Coal transport	...	...	...	...	38
Thefts	...	...	...	...	39
Railway Police	...	...	...	...	39
Classification of Passenger traffic	...	...	...	...	40
Overcrowding of carriages	...	...	...	...	41
Increase in rates and fares	...	...	...	...	41

CHAPTER VII.

FINANCIAL RESULTS :—

Effects of high prices on railway finance	...	...	...	...	42
Indirect Benefit of Railways to tax-payers	...	...	...	...	42
Earnings	...	...	...	...	42
Receipts	...	...	...	...	43
Financial Results	...	...	...	...	43
Net profit from Railways	...	...	...	...	44
Rate of interest	...	...	...	...	45
Summary	...	...	...	...	45

CHAPTER VIII.

ACCIDENTS :—

Total fatalities and injuries	...	...	...	...	47
SERIOUS ACCIDENTS ON—					
Oudh and Rohilkhand Railway	...	...	...	...	47
Bombay, Baroda and Central India Railway	...	...	...	...	48
Bengal-Nagpur Railway	...	...	...	...	48
Madras and Southern Mahratta Railway	...	...	...	...	48
Great Indian Peninsula Railway	...	...	...	...	49
South Indian Railway	...	...	...	...	49

CHAPTER IX.

STORES :—

Extent of purchases	...	...	...	...	50
Sources of Supply	...	...	...	...	50
Indigenous Stores	...	...	...	...	50
Imported Stores	...	...	...	...	50
Value of Stores purchased	...	...	...	...	51
Analysis of Stores purchased	...	...	...	...	51

CHAPTER X.

CONCLUSION :—

Technical	...	...	...	...	53
Conclusion	...	...	...	...	54

APPENDICES.

A.—Notes on the relation of the Government to Railways in India	55
B.—Terms for construction of Branch Lines by private companies	62
C.—Rules for determining the headways and waterways under railway bridges over navigable channels	72
D.—Training of educated Indians in Mechanical Engineering	74

ADMINISTRATION REPORT

ON THE

RAILWAYS IN INDIA

FOR THE YEAR

1920-21

Introductory Review of trade position.

India has hitherto been primarily an exporting country with a consequent favourable balance of trade. The outstanding feature of 1920-21 is the reversal of this position consequent on an enormous increase in the value of imports coupled with a serious decline in exports. The gross imports of private merchandise reached the record figure of Rs. 336 crores, an increase of no less than 61 per cent. over previous year's figure of Rs. 208 crores. The exports of private merchandise including re-exports, on the other hand, declined by Rs. 70 crores or 22 per cent. as compared with those in the preceding year and amounted to Rs. 256 crores. There is thus left a net balance of imports valued at Rs. 80 crores as against net exports of Rs. 119 crores in the previous year. These figures exclude statistics of treasure, Council bills and other remittances, but even with this addition the balance of trade was against India to the extent of 50 crores as compared with a favourable balance of Rs. 88 crores in the preceding year. The total overseas trade in merchandise and treasure on private account in 1920-21 was remarkably high, amounting to Rs. 640 crores as against Rs. 553 crores in 1919-20.

Extent of imports and exports.

2. The most noticeable features of the import trade of the year 1920-21, as compared with 1919-20, are (a) a large increase in manufactured goods imported into India, the chief contributors to this increase being cotton piece-goods, iron and steel, machinery and mill work, railway plant and rolling-stock, cotton twist and yarn, motor cars and motor cycles, hardware and woollen piece-goods; and (b) a decrease in sugar and to a small extent in kerosene oil, and silk piece-goods. The chief features of the year's export trade are (a) an increase in the value of food grains exported, and (b) a heavy decrease in respect of most other commodities especially raw hides and skins, raw cotton, seeds, tanned hides and skins, raw jute and cotton twist and yarn.

Noticeable features of import and export trade.

3. The Indian markets were at the close of the year seriously overstocked with manufactured goods, and dealers have found themselves face to face

Trade depression.

with a difficult financial position. On account of shortness of crops as well as the fact that the power of India's customers to purchase her produce has been severely restricted, the export trade has suffered an almost unparalleled depression.

Agricultural position.

4. It is not proposed to attempt in this brief review any analysis of the causes which have contributed to the abnormal trade position described above. A brief reference to the agricultural position is, however, necessary, since the business of the transporting agent in India is very largely dependent on agricultural results. The monsoon on which everything depends began well and ended badly. The average rainfall of the monsoon period over the plains of India as a whole was 12 per cent. below normal and as a consequence most of the important crops, such as wheat, cotton, jute, were seriously affected. The season was, however, somewhat favourable for the rice crop in Eastern and Southern India. The total quantity of cotton produced was 39 per cent. and of jute 30 per cent. less than the previous year's yield. Rice suffered rather less but the production was still 12 per cent. less than in 1919-20. Nearly all other commodities showed similar results, and export was further retarded by uncertain prospects of the future and the spectre of impending famine due to the premature closing of the rains.

Shipping position.

5. Intimately connected with this question of export is the position in regard to shipping and freights. India has, of course, shared in the difficulty of shortage of shipping and higher freights which has affected the whole world as a consequence of the war. From these difficulties the country is only just beginning to emerge. During the year under review, some improvement was made as is evident from the returns which show that the net tonnage of vessels entering ports in British India with cargoes from foreign countries and British possessions amounted to 6,557,470 tons as against 5,166,320 tons and the net tonnage cleared amounted to 7,041,003 tons as against 6,163,853 tons in 1919-20. Owing to the depressed condition of export trade shippers have experienced great difficulties in fulfilling their freight engagements, and the result has been to bring down to a considerable extent the high rates of freight previously obtaining. In the interests of railways in India which depend so greatly on favourable trade conditions it is to be hoped that this tendency towards low freights and increased tonnage may continue and that more favourable internal prospects and the re-opening of European markets may shortly terminate the period of depression from which the country has suffered in 1920-21.

CHAPTER I.

LINES OPEN, UNDER CONSTRUCTION AND PROJECTED.

(See Appendices 1, 2, 3 and 10 of Volume II.)

The total length of Indian Railways open for traffic on the 31st March 1920 was 36,735 miles. During the financial year 1920-21, 298 miles were added, bringing the total mileage open (after allowing for minor corrections due to realignments, rechainage, etc.) on the 31st March 1921 up to 37,029 miles. This great property represents the result of 68 years of construction from the first modest opening in 1853 represented by the little suburban line from Bombay to Thana, 21 miles in length, laid with light iron rails and equipped with three small engines and a dozen primitive carriages. From that date onwards extension and improvement have steadily continued, varying sometimes in speed to accord with prevailing financial policy. It is interesting in this connection to trace the contribution to open mileage represented by each succeeding Viceregal administration :—

Name of Viceroy.	Period.	Miles opened.
Marquis of Dalhousie	1853-1855 ...	169
Earl of Canning	1856-1861 ...	1,418
Earl of Elgin	1862-1863 ...	920
Lord Lawrence	1864-1868 ...	1,501
Earl of Mayo	1869-1871 ...	1,066
Lord Northbrook	1872-1875 ...	1,467
Lord Lytton	1876-1880 ...	2,621
Marquis of Ripon	1881-1884 ...	2,469
Earl of Dufferin and Ava	1885-1888 ...	2,945
Marquis of Lansdowne	1889-1893 ...	3,928
Earl of Elgin	1894-1898 ...	3,536
Lord Curzon	1899-1905 ...	6,255
Earl of Minto	1906-1910 ...	3,805
Lord Hardinge	1911-1915-16 ...	3,733
Lord Chelmsford	1916-17-1920-21 ...	1,196
	Total	37,029

It will be noticed that the progress in the last few years has been very appreciably slower and this is principally due to the war, with enforced financial economy and actual shortage of materials. But the high value of money, combined with the increased cost of materials and labour, has

introduced in recent years an entirely new economic factor into the problem of railway extension, and it is probable that even when materials are once again plentiful, it will be found difficult to resume from State resources the previous speed of construction if extensions are to be confined to projects which are calculated to yield a profit sufficient to cover the interest on their capital outlay. An exactly similar difficulty applies to construction financed by Indian Railway Companies, since capital will not be available for lines which cannot show a fair certainty of substantial early profits sufficient to provide an attractive rate of interest on the money subscribed.

Tracks.

2. The greater part of the railways in India consists of single track, and the provision of double tracks in busy areas is becoming each year of more importance. During the year under review, 66 miles of line, from Begmanji to Chahi (63 miles) and Shakurpur to Delhi-Kishengunj (3 miles) on the North Western Railway were doubled. The following table shows the relative length of each kind of track at the end of last year.

	Miles.
Single line	33,985
Double line	2,948
Triple line	29
Quadruple line	64
Quintuple line	2
Sextuple line	1
Total	37,029

The amount of double line is still comparatively small and is made up as below :—

Railway.	Locality.	Miles.
North Western	Karachi to Samasata (excluding certain lengths), Saharanpur to Shahdara, Lahore to Raewind, Rawalpindi to Golra, etc.	860
Great Indian Peninsula	Thana to Itarsi, Kalyan to Poona, Bhusawal to Nagpur, etc.	731
East Indian	Calcutta to Allahabad, Ghaziabad to Delhi and certain lengths on the Grand Chord and branches.	655
Bombay, Baroda and Central India.	Bombay to Baroda and Ahmedabad to Barejadi, etc. ...	259
Eastern Bengal	Calcutta to Ishurdi (near Sara bridge), Calcutta to Baruipur, etc.	141
Burma	Rangoon to Pyuntaza and Rangoon to Wanetchaung ...	119
Bengal-Nagpur	Calcutta to Khargpur, Bankura to Adra and Shalimar branch	106
Madras and Southern Mahratta	Madras to Arkonam	45
Other railways		32
	Total	2,948

Triple, quadruple, quintuple and sextuple tracks are confined to areas in the vicinity of Calcutta and Bombay where the suburban traffic is very heavy.

3. The earliest railways in India were constructed on the 5' 6" gauge which it was intended should remain the standard gauge. Later, after prolonged discussion, it was decided, principally on the score of economy, to construct lines on the metre gauge in places where the prospective traffic was not heavy or high speed essential. Many of the lines so constructed have been since converted to the standard gauge; but one of the earliest, the Rajputana-Malwa Railway now part of the Bombay, Baroda and Central India Railway, still maintains its metre gauge track. Later still, various short feeder lines on the 2' 6" gauge which originally were little more than steam tramways laid on existing roads, were added. And lastly a still smaller gauge of 2 ft. was first adopted for the purpose of the hill railway to Darjeeling which was opened in 1880 and further extensions on this gauge have since been made. There are thus at the present day four gauges in India, the mileages being as follows :—

					Miles.
Broad gauge (5' 6")	...	...	...	...	18,195
Metre " (3' 3 $\frac{1}{8}$")	...	...	...	...	15,248
Narrow " (2' 6")	...	...	...	...	2,948
" " (2' 0")	...	...	...	...	638
Total					87,029

It will be seen that about half of the total length is on the broad gauge.

During the year under review, the conversion to broad gauge of the Nowshera-Durgai (2' 6") branch of the North Western Railway and of the Santahar-Parbatipur (3' 3 $\frac{3}{8}$ ") section of the Eastern Bengal Railway was taken in hand. The question of the conversion of a portion of the Jodhpur-Bikaner Railway from metre to broad gauge has been receiving consideration in connection with the proposed Agra-Karachi broad gauge Railway.

4. The first railways in India were financed and constructed by Companies supported by a guarantee of the Government of India. Direct State construction from borrowed capital began in the early seventies and for some years this policy was steadily adhered to. Later, however, the difficulty of finding the necessary capital by direct borrowing induced a return to the previous procedure, the State retaining the power to purchase after a definite period of tenure. This power of purchase has been consistently used to acquire railways as the Companies' contracts expired and at the present day there are only four important lines, the Bengal and North-Western, the Southern Punjab, the Delhi-Umballa-Kalka, and the Rohilkund and Kumaon Railways which are not the property of Government.

Apart from the above a considerable mileage of railways has in more recent years been constructed by Indian States and by the agency of small feeder companies.

There are thus in India at present three principal owners of railways whose lines represent the following mileage:—

	Miles owned.
(i) Government (including Provincial Governments and District Boards).	26,889
(ii) Indian States	4,394
(iii) Private Companies	5,746
Total	37,029

It will be seen that nearly six-sevenths of the total mileage belongs to Government and the Indian States, while only one-seventh is owned by private Companies. Nationalisation, so far as ownership is concerned, of Indian Railways has, therefore, already been practically effected.

Working Agencies.

5. The principle of Government-owned railways being leased to Companies to work is almost peculiar to India and the ultimate wisdom of this policy has in recent years been the subject of very keen controversy. The question of future policy in this matter formed an important part of the deliberation of a special committee of experts assembled for the purpose during the year under review. The actual mileage worked by the different agencies is as follows:—

	Miles worked.
(i) Government	8,929
(ii) Indian States	2,889
(iii) Companies	25,211
Total	37,029

The following are the railways under the direct control of Government:—

	Miles worked.
(1) North Western Railway	5,520
(2) Eastern Bengal Railway	1,738
(3) Oudh and Rohilkhand Railway	1,609
(4) Jorhat (Provincial) Railway	33
(5) Aden Railway	29
Total	8,929

The Indian States that work railway lines are as under :—

						Miles worked.
(1) Jodhpur	...	...	...	...	...	} 1,356
(2) Bikaner	...	...	...	...	...
(3) Mysore	...	...	...	...	...	391
(4) Gwalior	...	...	...	...	...	250
(5) Gondal	...	...	...	...	...	231
(6) Bhavnagar	...	...	...	...	...	217
(7) Junagad	...	...	...	...	...	141
(8) Morvi	...	...	...	...	...	93
(9) Udaipur	...	...	...	...	...	67
(10) Navanagar	...	...	...	...	...	54
(11) Dholpur	...	...	...	...	...	52
(12) Cutch	...	...	...	...	...	37
Total					...	2,889

The Companies that undertake the working of Indian Railways are as follows :—

COMPANIES WHO WORK STATE-OWNED RAILWAYS.			COMPANIES WHO WORK PRIVATE-OWNED RAILWAYS.		
Company.	Domiciled in	Miles worked.	Company.	Domiciled in	Miles worked.
(1) Bombay, Baroda and Central India Railway.	England	3,933	(11) His Exalted Highness the Nizam's Guaranteed State Railways.	England	897
(2) Great Indian Peninsula Railway.	England	3,335	(12) Messrs. Martin & Co.	India	325
(3) Madras and Southern Mahratta Railway.	England	3,047	(13) Messrs. McLeod & Co.	India	188
(4) Bengal-Nagpur Railway.	England	2,843	(14) Bengal Dooars Railway	England	158
(5) East Indian Railway...	England	2,770	(15) Darjeeling-Himalayan Railway.	India	146
(6) Bengal and North-Western Railway.	England	2,063*	(16) Barsi Light Railway...	England	118
(7) South Indian Railway	England	1,852	(17) Assam Railways and Trading Company.	England	91
(8) Burma Railways	England	1,623	(18) Guzerat Light Railways	India	89
(9) Assam-Bengal Railway	England	1,021	(19) Bengal Provincial Railway.	India	42
(10) Rohilkund and Kumaon Railway.	England	575†	(20) East India Distilleries and Sugar Factories, Limited.	India	32
			(21) Dehri-Rohtas Light Railway.	India	24
			(22) Tezapore-Balipara Light Railway.	India	20
			(23) Madaya Light Railway	India	16
			(24) Jagadhri Light Railway	India	3
			Total	...	25,211

* 815 miles owned by the State and 1,248 miles by the Bengal and North-Western Railway Company.
 † 316 miles owned by the State and 259 miles by the Rohilkund and Kumaon Railway Company.

The relations between Government and the Companies working State-owned lines will be found explained at the end of this volume (see Appendix A) and need not be referred to here.

**New Lines
Opened.**

6. The construction of new lines has, for financial reasons and owing to shortage in the supply of materials, been retarded in recent years, and this accounts for the comparatively short mileage added during the year under review. Of the 298 miles opened in 1920-21, more than half the length is represented by a military railway and the balance is made up of a few short branches financed mostly by Indian States and Branch Line Companies. The following is the list of the lines opened :—

Name of line.	Gauge.	Length.	Owner.	Working Agency.	Date of opening.
(1) Dalbandin-Mirjawa ...	Broad ...	Miles. 189.50	Government ..	North Western Railway	1st October 1920.
(2) Aungban-Heho ...	Metre ...	16.30	.. ...	Burma Railways Co. ..	17th January 1921.
(3) Baripada-Talband ...	Narrow...	38.23	Branch Line Company.	Bengal-Nagpur Railway Co.	15th July 1920.
(4) Becharji-Dewasna ...	Metre... {	15.64 6.46 }	Baroda State	Baroda State ... {	1st May 1920. 1st March 1921.
(5) Sawar-Kundla- Gadhakda.	..	10.98	Bhavnagar State.	Bhavnagar State ...	1st February 1921.
(6) Chickjajur-Chitaldrug	..	20.90	Mysore State	Mysore State ...	5th January 1921.

A brief description of the more important of the railways opened during the year and referred to in the statement above may be of interest.

(1) *Dalbandin-Mirjawa*.—This is a section of the Nushki Extension Railway in Baluchistan which was built for military purposes. The section, 189.5 miles long, was opened for public traffic on 1st October 1920.

(2) *Aungban-Heho*.—This is a section of the Southern Shan States Railway in Burma. It passes through hilly country and is designed to open a fertile valley. The greater portion of the earthwork, with some masonry work on bridges, was carried out by Turkish prisoners of war.

(3) *Baripada-Talband*.—This is an extension of the Mayurbhanj Railway in the province of Bihar and Orissa. The main object of the extension is to provide an outlet for the large supply of excellent timber for sleepers and building purposes from the extensive forests in the Mourbhanj State.

7. When the war broke out, a fairly extensive programme of construction was in contemplation and several of the lines had in fact already been started. The necessity for rigid financial economy combined with the diversion of the supply of materials immediately put a stop to all ideas of new projects and made it necessary to close down or retard progress even on those which had been started. With the cessation of hostilities these difficulties have only partially disappeared. Materials are available only in very limited quantities and both in this respect and in the matter of finance the needs of open lines have to be given first consideration. Consequently progress has been slow.

Lines under construction.

Below is a list of lines on which work was actually in progress during last year. Brief remarks in respect to some of the more important lines are appended.

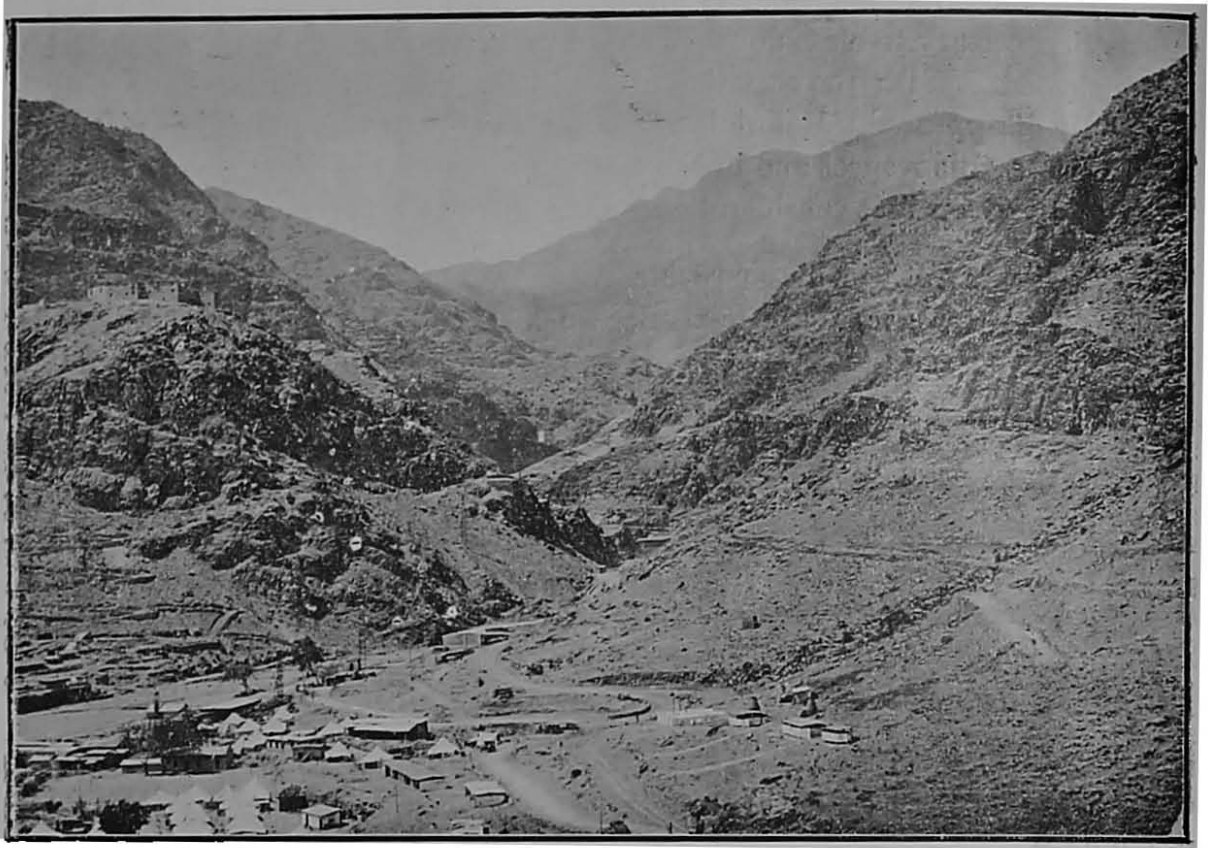
Name of Railway-	Gauge.	Length.	Constructing Agency.	Progress of work on 31st March 1921. Proportion completed.
Khyber Railway	5' 6"	26'00	Government ...	Preliminary works being carried out.
Amla to Nagpur	5' 6"	103'74	G. I. P. Ry. Co. ...	'78
Bokharo-Ramgarh Extension	5' 6"	18'75	B. N. Ry. Co. ...	'03*
Amda-Jamda Branch	5' 6"	65'62	Ditto ...	'30
Onlajori-Badampahar	5' 6"	21'75	Ditto ...	'39
Kasta Coal-field	5' 6"	17'01	E. I. Ry. Co. ...	'66
Balharshah-Warangal	5' 6"	149'50	Nizam's Rys. Co. ...	'05
Alon-Saingbyin (Provincial)	3' 3½"	26'51	Burma Rys. Co. ...	'33
Moulmein-Ye (Provincial)	3' 3½"	88'71	Ditto ...	'07
Pyinmana-Taungdwingyi (Provincial)	3' 3½"	66'90	Ditto ...	{ '64† '17‡
Hanumangarh-Sadulpur	3' 3½"	105'00	} J. B. Ry. ...	'04
Marwar Junction-Jiyawar	3' 3½"	21'50		'46
Bikaner-Kolayat	3' 3½"	27'03		'01
Gadhakda-Mahuva, with a branch to Port Albert Victor.	3' 3½"	43'32	Bhavnagar State ...	'43
Okhamandal	3' 3½"	37'02	Baroda Durbar ...	'80
Motipura-Tankhala	3' 3½"	26'70	Ditto ...	'88
Tank-Kaur-Khirgi	2' 6"	33'13	N. W. Ry. ...	'76
Futwah-Islampur Light	2' 6"	27'00	Futwah-Islampur Lt. Ry. Co.	'60
Larkhana-Dodapur	2' 6"	54'23	Larkhana-Jacobabad (Sind) Lt. Ry. Co.	'30
Choranda-Koral	2' 6"	11'68	Baroda Durbar ...	'98
Agasanhadlu-Benkipur	2' 0"	24'50	Mysore Durbar ...	'62
Kammangundi-Benkipur	2' 0"	22'80	" " ...	'65

* Represents work on Bermo-Sawang section, a distance of 6 miles.

† Represents work on 17 miles from Pyinmana to Kantha.

‡ Represents work on 50 miles from Kantha to Taungdwingyi.

- (1) *Khyber Railway*—is a frontier line designed to meet military requirements. It is 26 miles long and is estimated to cost nearly two crores of rupees



Ali Masjid Gorge, Khyber Railway.

- (2) *Amda-Jamda Branch of Bengal-Nagpur Railway*—is intended to tap rich iron ore deposits in Singhbhum District in Bihar and Orissa. The length of the line is 63 miles and the cost is estimated at Rs. 73 lakhs.
- (3) *Amla-Nagpur Section of Itarsi-Nagpur Railway*.—This line has, for unavoidable reasons, taken an unusually long time to complete ; work had to be shut down during the war ; it has now been resumed and it is hoped that it will be pushed forward without further delay.
- (4) *Burma Provincial Railways*.—(Pyinmana-Taungdwingyi, Alon-Saingbyin and Moulmein-Ye). These are agricultural railways, 182 miles long, which are being financed by the Burma Government and constructed by the Burma Railways Company.
- (5) *Balharshah-Warangal Railway*—will afford an important link between the broad gauge railways in the north and south of India. The line, about 150 miles in length, is being financed by His Exalted Highness the Nizam of Hyderabad.

Projected Lines.

8. For reasons already given the immediate prospects of further progress in new construction are very limited. Preliminary measures in the

way of surveys and estimates have, however, been completed for a great number of projects in different provinces and the work in this respect has been continued, so that everything may be ready for a resumption of the work of extension as soon as the present difficulties disappear.

During the year under review the following important lines were under survey :—

- (1) Hukong Valley route of the Indo-Burma Connection Railway.
- (2) Monharpur coal-fields Railway.
- (3) Mirzapur-Maihar and Daltonganj-Hutar coal-fields Railway.
- (4) Tube Railways in Calcutta.
- (5) Karad-Chiplun-Ulva Railway.
- (6) Hardwar-Karnprayag Railway.
- (7) Agra-Karachi Connection Railway.

Project (1) is intended to afford a connection between the railways in India and Burma. Projects (2) and (3) are designed to serve new coal-fields areas. Project (4) is of considerable local importance to Calcutta. Project (5) will assist in the development of Messrs. Tata's Koyne Hydro-Electric Scheme. Project (6) will facilitate the pilgrimage to Badrinath. Project (7) is of great interest to the trading public of the United Provinces and Karachi.

9. Before leaving this subject a word of mention is perhaps necessary in regard to Government assistance to private enterprise. The original conditions governing this matter which are printed as Appendix B to this volume were framed before the war and are in present financial conditions insufficient to attract capital. The question of revision has, however, been deferred until Government have had an opportunity of ascertaining public opinion in this matter, and in the meantime cases of urgent lines are being dealt with specially without prejudice to the general principle which will ultimately be adopted.

**Branch Line
terms.**

CHAPTER II.

CAPITAL RAISED AND EXPENDED.

(See Appendix 4 of Volume II.)

**Capital
Liability.**

Owing to the fact that Indian State Railways, as they exist at the present day, represent the accumulated result of direct State construction and the acquisition of lines constructed and equipped by Companies, it is difficult or impossible to give a comprehensive statement which will correctly convey an idea of the capital liability incurred by Government in respect of the property as a whole. It was in fact found that the attempt in this direction which appeared in previous reports as Appendix 5 of Volume II contained so many unavoidable anomalies that it has been decided to discontinue this statement altogether. No useful purpose is in fact served by attempting to study this complicated question as a whole. The circumstances of each line must be separately considered if a true estimate of the financial aspects of the acquisitions from the point of view of the Government of India is to be formed. To attempt anything of this sort is beyond the scope of this report, but it will perhaps be useful if a few of the salient facts are referred to.

**Methods of
discharging
liability.**

2. The liability on account of railways purchased from Companies has been discharged by three principal methods :—

- (a) Direct purchase by cash.
- (b) Purchase by payment in form of India Stock specially issued for the purpose.
- (c) Purchase by means of terminable annuities.

The first method is obviously only suited to the case of small lines. The second method was used in the purchase of the Oudh and Rohilkhand, South Indian, Bombay, Baroda and Central India and Indian Midland Railways. Purchase by means of annuities has been effected in the case of the East Indian Railway, Great Indian Peninsula Railway, Madras Railway, Eastern Bengal Railway and the old Sind-Punjab and Delhi Railway which now forms part of the North Western Railway. Simultaneously with the acquisition of the share capital, Government has of course assumed liability for the debenture stock in all cases and from the date of purchase all further capital outlay has to be met either by direct provision from Government resources or by capital raised by further issues of debenture stock.

3. Capital expenditure from Government resources on railways in the last eight years has been as follows :—

**Capital
Expendi-
ture.**

Year.	OPEN LINES.			New Lines.	Grand Total.
	Works, including stores, etc.	Rolling-stock.	Total.		
	Rs. (in lakhs.)	Rs. (in lakhs.)	Rs. (in lakhs.)		
1913-14	9,29	7,31	16,60	1,86	18,46
1914-15	6,72	9,08	15,80	1,35	17,15
1915-16	1,74	4,06	5,80	94	6,74
1916-17	1,14	72	1,86	1,11	2,97
1917-18	1,49	90	2,39	1,40	3,79
1918-19	5,02	71	5,73	51	6,24
1919-20	8,72	4,56	13,28	21	13,49
1920-21	12,91	10,15	23,06	1,02	24,08*

It will be noticed that fairly generous expenditure has been found possible in the years following the war, but it is unfortunately the case that even this scale of outlay has not sufficed to make good in any appreciable degree the leeway incurred during the war. Moreover, the figures by themselves are rather apt to mislead unless allowance is made for the very important fact of rise of prices which has reduced the effective value of money in some cases to less than half.

4. In considering the division of expenditure between rolling-stock and other works, there is one point which it is important should be borne in mind. Public criticism of railway shortcomings in recent years has been directed principally to the shortage of stock which to those unacquainted with the details of practical railway working appears to constitute the principal if not the only difficulty in the matter. It is assumed, therefore, that given an unlimited supply of wagons, the troubles of the public in respect of transport would immediately disappear. Unfortunately, however, the solution of this question depends on other factors which are not so simply disposed of. Railways cannot handle unlimited stock without adequate facilities, such as yards, sidings, double lines, extended repair shops, etc. To provide unlimited stock before these facilities would produce confusion and a superfluity of idle stock. The work of bringing railways up to the necessary standard in this respect is a question of time and the expenditure of large sums of money. So far as the latter requirement is concerned, it is within the power of the public to give very effective help to Government, but until lines have been equipped to move a greater volume of additional stock, it is futile to agitate for the purchase of wagons or

**Open line
facilities.**

* This figure excludes Rs. 1,98 lakhs on account of exchange adjusted in the supplementary accounts.

to suggest that the difficulty would be solved by special expedients such as private ownership. This matter will be more fully dealt with in a subsequent chapter, but it is not to be inferred that the necessity for increasing stock up to the full limit which can be economically used has been lost sight of, and the liberal sums devoted to this purpose in recent years will show that this matter has been kept in view. A few details in regard to the less obvious work in connection with traffic facilities may perhaps be of interest.

**Quadrupling
and doubling
of lines.**

5. Quadrupling of lines is being extended in the suburban areas of Bombay and Calcutta. This work when completed will afford very great relief in respect of the housing difficulties in those cities and will facilitate greatly the work of dealing with the heavy traffic flowing towards and originating from the two largest trade centres of the Empire. Doubling operations were in progress during the year on the East Indian, Bengal-Nagpur, North Western and Great Indian Peninsula Railways. On the East Indian Railway, the work is in connection with the Grand Chord line which forms the shortest route to the port of Calcutta from Upper India. The Sini-Monharpur doubling on the Bengal-Nagpur Railway is a matter of great importance in connection with the important steel industry developing in that area. On the North Western Railway, the Rohri-Kotri doubling was nearly completed; this work was undertaken in the interest of the wheat traffic from the Punjab. Kachagarhi-Jamrud doubling on the North Western Railway has been taken in hand for military purposes. The only other important doubling project in hand is the Shegaon-Nagpur doubling of the Great Indian Peninsula Railway on which good progress has been made.

**Remodelling
of yards.**

6. During the year under review the remodelling of 41 station yards was in hand, the most important of which were--

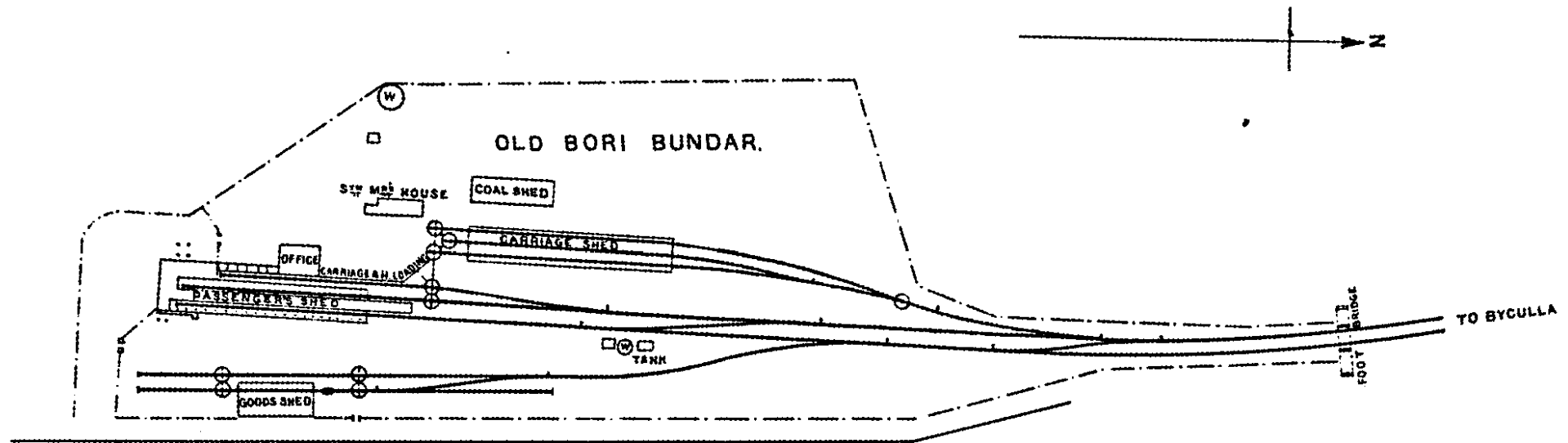
- (1) Nagpur station remodelling.
- (2) Sealdah and Belliaghata remodelling (in Calcutta).
- (3) Bezwada station remodelling.
- (4) Tondiarpet station remodelling (in Madras).
- (5) Poona station remodelling.

Some idea of the amount of work involved will be gathered from the fact that the aggregate cost of improvements to these five yards is estimated at Rs. 2,37,89,649. The interesting plan reproduced in the present report of the original terminal yard of the Great Indian Peninsula Railway at the old Bori Bundar station compared with that at present in use with proposed additions will also perhaps convey some impression of the amount of extension entailed by increased traffic.

**Staff
Quarters,
etc.**

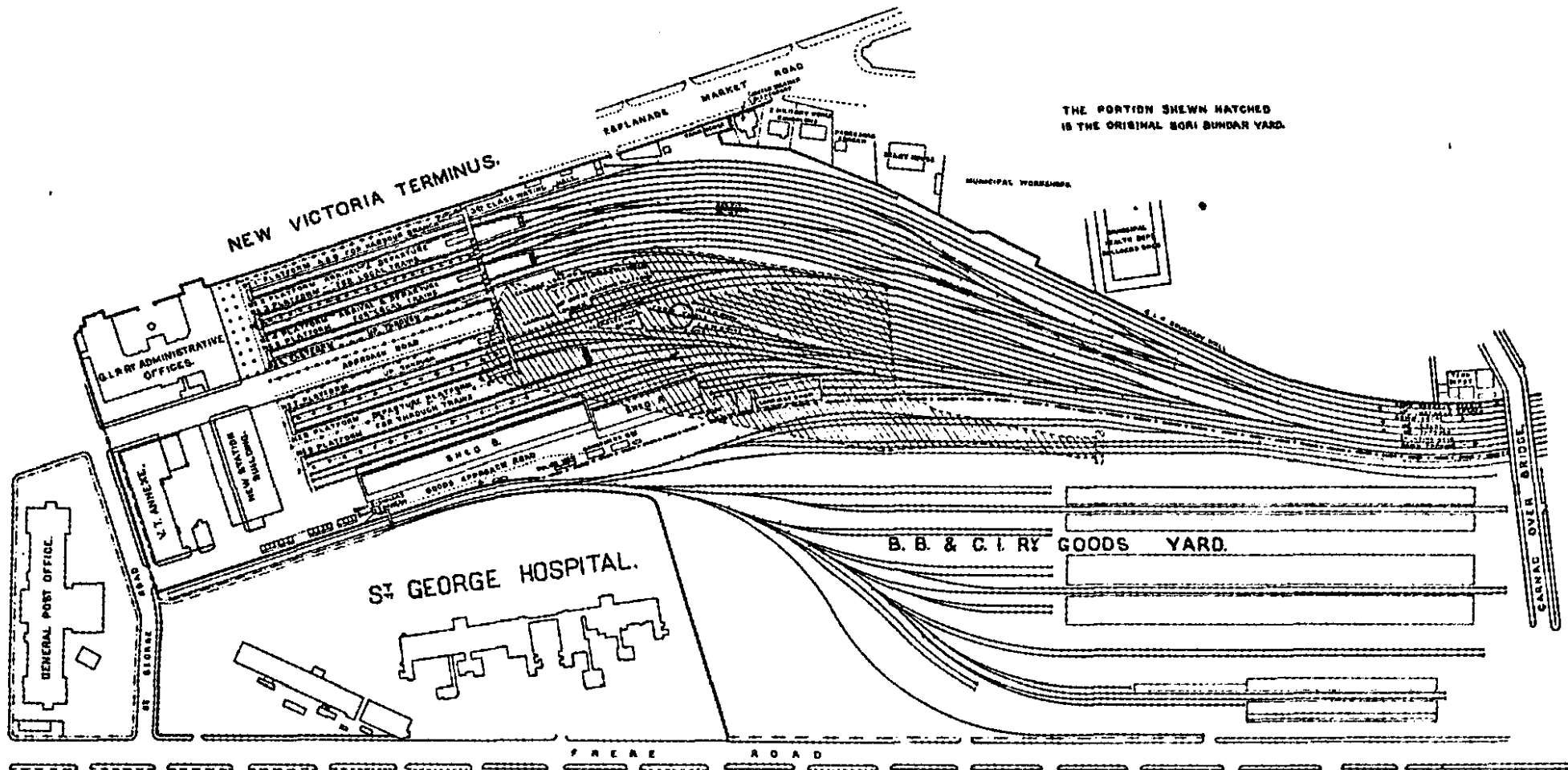
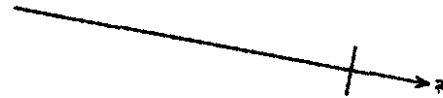
7. Apart from extension of yards, provision for increased traffic involves larger station accommodation, more crossing stations, better water-supply and quarters for the staff. This latter is now a very serious question on

G. I. P. R.
ORIGINAL BORI BUNDAR TERMINUS.
SCALE 200 FEET TO AN INCH.



G. I. P. R.
PROPOSED VICTORIA TERMINUS.

SCALE - 400 FEET TO AN INCH.



nearly all lines. The public have had unfortunate evidence of the discontent prevailing on some administrations and this question of quarters is a matter of very great importance as it is impossible to expect a contented staff if they are not decently housed. Every effort has, therefore, been made to improve matters in this direction and the expenditure on this item alone during the year 1920-21, was in the neighbourhood of Rs. 150 lakhs.

8. So much for what has been or is being done. But a consideration of what remains shows only too clearly that we have so far only touched the fringe of the subject. The administration of nearly every railway in India represents the necessity of extended repair facilities in shops, larger yards, stations, etc. The estimates for a few of these projects will perhaps convey some idea of the magnitude of the work still to be done.

Projected
Open line
Works.

	Rs.
(1) Remodelling Victoria Terminus, Great Indian Peninsula Railway	47 lakhs.
(2) Grant Road terminal station, Bombay, Baroda and Central India Railway	16 „
(3) Grant Road-Bandra quardrapling	34 „
(4) Remodelling Mazgaon station yard	36 „
(5) Electrification of the Bombay Suburban sections of the Bombay, Baroda and Central India and Great Indian Peninsula Railways	376 „
(6) Remodelling of Lucknow station yard	16 „
(7) Improvements to traffic yard and extensions of workshops at Allahabad station, East Indian Railway	46 „
(8) New workshops at Drig Road station near Karachi, North Western Railway	336 „
(9) New shops at Dohad, Bombay, Baroda and Central India Railway	200 „

In addition to these the Bengal-Nagpur Railway have drawn up a scheme for the improvement of traffic facilities which is estimated to cost about 2½ crores of rupees. These works are required with a view to afford transport facilities for the carriage of the large traffic expected from the steel industry. Besides these large schemes, there are of course hosts of smaller ones still waiting. A proportion of the extensive schemes may eventually not be accepted in their entirety, but it will be obvious from the figures given that very heavy expenditure is unavoidable if even a moiety of the claims are to be met.

9. There is one other matter in respect of capital expenditure of considerable interest to the public which may be mentioned here. During the war, it was unfortunately necessary to dismantle a considerable mileage

Replacement of lines dismantled.

of existing lines in order to provide material required in theatres of war. The total mileage affected was 463·03.

Names of lines.	Gauge.	Miles.	Working Agency.
1. Sulej Valley	5' 6"	230·00	North Western Railway.
2. Guntur-Tenali	5' 6"	17·00	Madras and Southern Mahratta Railway.
3. Hyderabad-Badin	5' 6"	64·78	North Western Railway.
4. Sambhal-Hatim Serai	5' 6"	14·25	Oudh and Rohilkhand Railway.
5. Bhagalpur-Bausi	5' 6"	32·00	East Indian Railway.
6. Powayan Tramway	2' 6"	40·00	Rohilkund and Kumaon Railway.
7. Sara-Santahar	3' 3½"	65·00	Eastern Bengal Railway. (Not to be replaced.)

Numerous representations have been received asking for the restoration of these lines and for every reason it is very desirable that they shall be replaced as soon as this can possibly be done. The difficulty in this respect has been in regard to material rather than finance. The supply both of rails and sleepers is hardly adequate to meet the urgent demands of main lines. During the year it was found possible to start work on the restoration of the Guntur-Tenali Branch of the Madras and Southern Mahratta Railway and on the Sambhal-Hatim Serai Branch of the Oudh and Rohilkhand Railway. The restoration of the other lines could not be undertaken, owing to the want of permanent-way materials. The question of taking these lines in hand has, however, not been lost sight of and it is hoped to make substantial progress in 1921-22.

CHAPTER III.

ROLLING-STOCK.

(See Appendices 16, 17, 18 and 19 of Volume II.)

The question of inadequacy of rolling-stock has been, and still is, a matter of considerable concern to the public who, in absence of information in regard to the full facts of the position, are perhaps naturally inclined to assume that the extent of inconvenience suffered is insufficiently realised, and that more might have been done to alleviate it. Conditions in this respect vary of course on different administrations, the difficulties in each case being due to particular circumstances. It is difficult, therefore, to make a general survey of the wagon position which will explain circumstances of any individual line, and it is equally impossible within the compass of this report to go into details of each case. A brief description of the more general difficulties which have been experienced in dealing with this complicated problem may, however, help to a better understanding of the position.

**Inadequacy
of Rolling-
Stock.**

2. As has already been mentioned earlier in the report, the actual shortage of stock represents only one side of the difficulty, and it is important that the necessity for increasing concurrently the capacity of the lines to handle the stock shall not be lost sight of. Even with the existing number of wagons, it is fairly evident that the economic handling of the existing stock is a very difficult matter. A very little examination of the figures in Appendix No. 17 in Volume II will in fact show the significance of this factor. For example, an indication of the want of repair facilities may be gathered from the fact that the percentage of engines and vehicles under repair has increased on most lines. On the Madras and Southern Mahratta Railway (5' 6" gauge), 18·27 per cent of the carriage stock was shown during the year under review as regularly under repairs against 10·53 in 1913-14. The wagon position was also bad, the percentage being 7·67 during the year under review against 4·89 in 1913-14. Some indication of the effect of want of traffic facilities combined with deterioration in the track may be gathered from the fact that the average speed of trains both goods and passenger on many lines has fallen. Similar indication will be found in the increase of empty running and decrease of loaded mileage. It is obvious, therefore, that the reasons giving rise to this tendency to uneconomical working will have to be dealt with concurrently with the question of wagon supply as a further increase of wagons in existing circumstances would simply accentuate this evil and would in a large measure fail to give the desired relief.

**Traffic
Facilities to
handle
stock.**

3. Leaving this aspect of the question we may now turn to the matter of the actual supply of stock. At the close of 1919-20, Indian Railways had actually 8,990 engines, 24,743 coaching vehicles and 194,701 goods vehicles. The additions actually placed on the line in 1920-21 amounted to 375 engines,

**Numbers
of Rolling-
Stock.**

208 coaching vehicles and 6,493 wagons. The distribution of this stock among the various broad, metre and narrow gauge railways is shown in the summary below :—

Gauge.					Engines.	Coaching vehicles.	Goods vehicles.
Broad	...	...	...	...	6,148	13,591	139,178
Metro	...	...	...	...	2,723	9,469	55,639
Narrow	...	...	...	...	494	1,891	6,377
Total					9,365	24,951	201,194

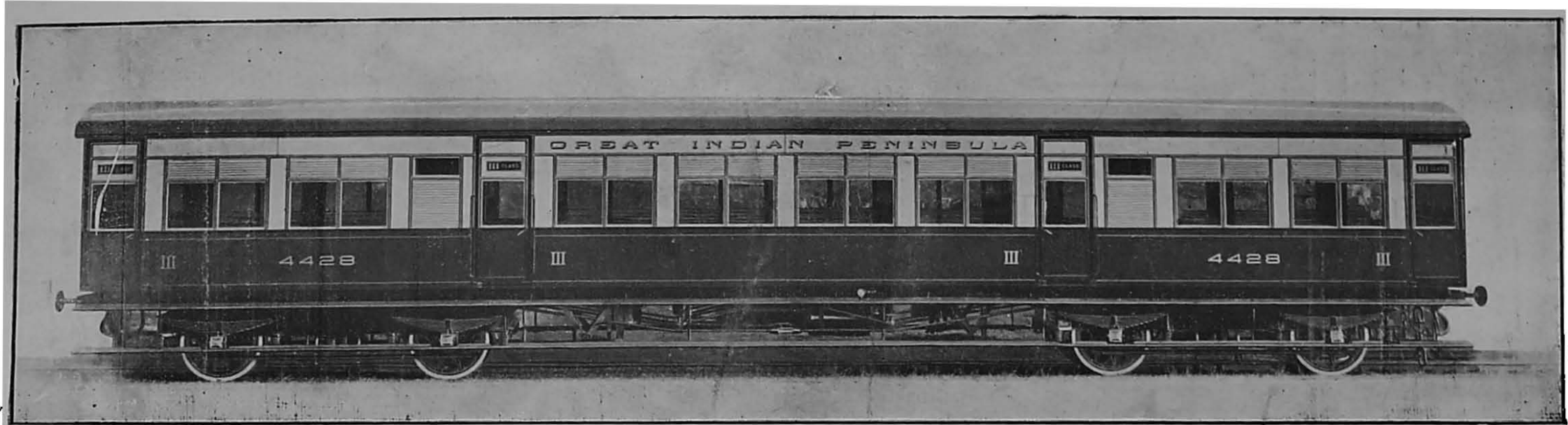
In addition to this stock, there are 116 rail motor cars in the possession of the railways, nearly half of which are used as inspection trollies by engineers in charge of maintenance of the permanent-way. The total value of the entire stock is a little over 1,30 crores of rupees. There is of course no standard by which we can judge to what extent this stock is below what is necessary, but there is one special factor which has conduced to such deficiency as exists which must be mentioned. During the war Indian Railways gave up 237 engines, 493 coaching vehicles and 5,502 wagons which were sent overseas for war purposes. This was a direct loss in addition to the ordinary decreases due to wear and tear occurring during the period. In spite, however, of this, the stock on all railways before the war and at the end of the year under review compares as follows :—

Year.		Engines.	Coaching stock.	Wagons.
1914-15	...	8,393	22,971	184,076
1920-21	...	9,365	24,951	201,194

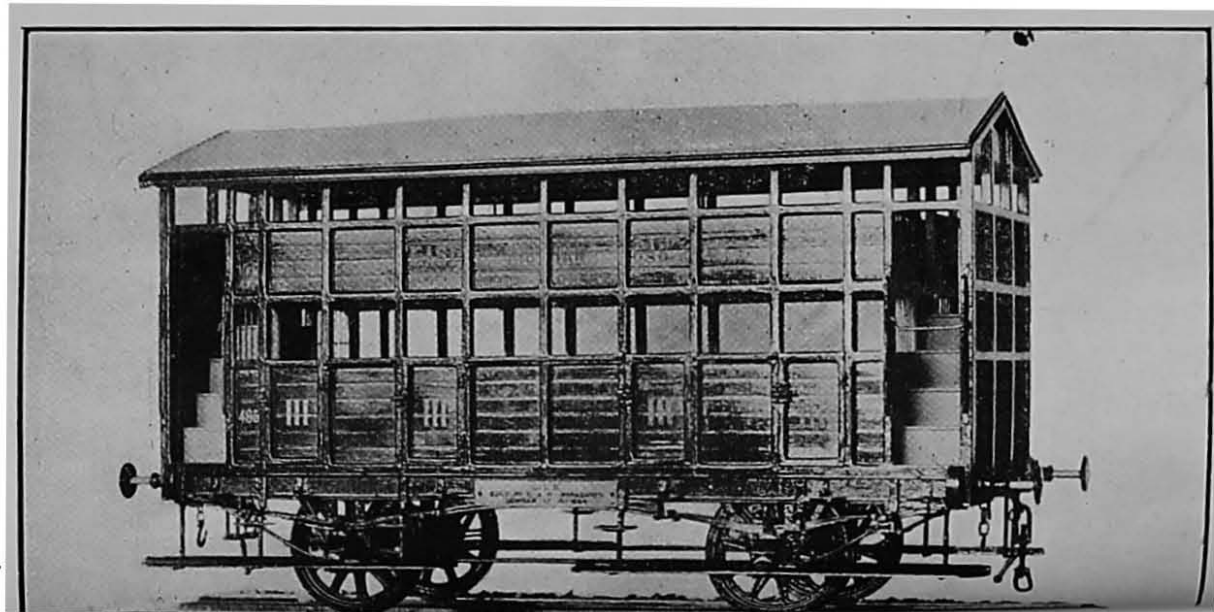
It is, therefore, evident that Railways have certainly not stood still in this matter of supply and to the extent to which the complaints of the public are justified they indicate that the needs have increased faster than the stock combined with the capacity to handle.

**Arrange-
ments for
Supply of
Stock.**

4. The next point for consideration is the question of the existing means of supply. India is so far incapable of making engines at all. The capacity of the existing private wagon constructing shops is very limited and even so the output is dependent upon supply of wheels, axles, brakegear, etc., from Home or abroad. Coaching stock is mostly erected in railway shops, but this work is dependent on supply of all the main parts and fittings from Home. The uncertainty of English supplies and the constant failure from one cause or another since the war is a matter of common knowledge. For these reasons no railway in India has been able to work up to even the programme of output for which funds had been provided.



Great Indian Peninsula Railway III Class Carriage (Modern).



5. Apart from this difficulty in respect of materials there is the question of finance. Prices at present show a tendency to fall, and it is hoped that this may continue. But the phenomenal increases in the cost of everything in the years following the war have been a matter of very serious concern to railways. The comparative prices of stock will forcibly illustrate this. **Financial Aspect.**

Before the war, a broad gauge superheater engine cost in England £3,910. In January 1919, the price of a similar engine was £8,300 and the price in the current year was in the neighbourhood of £11,000.

Before the war, a broad gauge 21' covered goods four-wheeled wagon cost about £210 and the price rose to £750 in 1920. Indian built wagons have cost about Rs. 10,000 to complete.

The cost of a third class bogie coach was about Rs. 30,000 which is equivalent to the pre-war price of quite a respectable sized bungalow.

It is obvious from these figures that the purchasing power of money in respect of stock has fallen to about one-third of the pre-war standard and to produce the same result the grants must be trebled. Simultaneously with this the rate of interest on borrowed capital has risen to nearly double. It is obvious, therefore, that if railways are in the interests of the taxpayer to be managed on commercial principles, it is impossible to neglect financial considerations in respect of the increase of stock any more than in regard to other questions of railway working.

6. Before leaving this question of inadequate supply of stock there is one special feature in the present circumstances which must be mentioned. **Diversion of wagons to Coal Areas.**

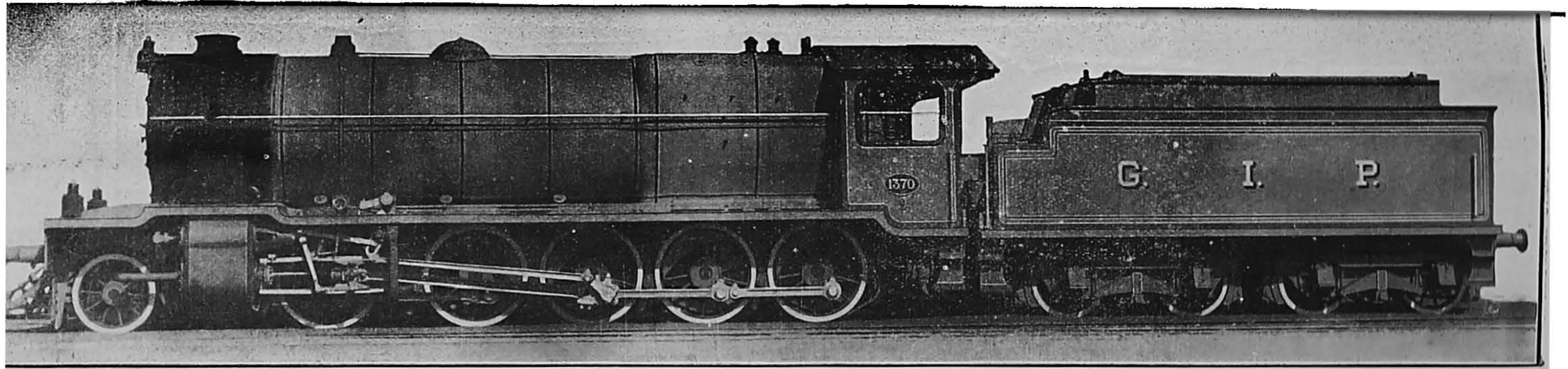
The wagon supply of all lines was pooled during the year under review. Prior to this restrictions on the loading of foreign wagons in the coalfields had been removed with the result that a considerable increase in the capacity of despatch from the coalfields was effected, amounting in 1920-21 to about 25 per cent.

Even so, however, the necessity of providing for the urgent demand for coal in different parts of the country has in effect led to the diversion of wagon supply to the coal areas. The extent to which this has taken place can be judged from the figures of borrowed wagons on the coal supplying lines.

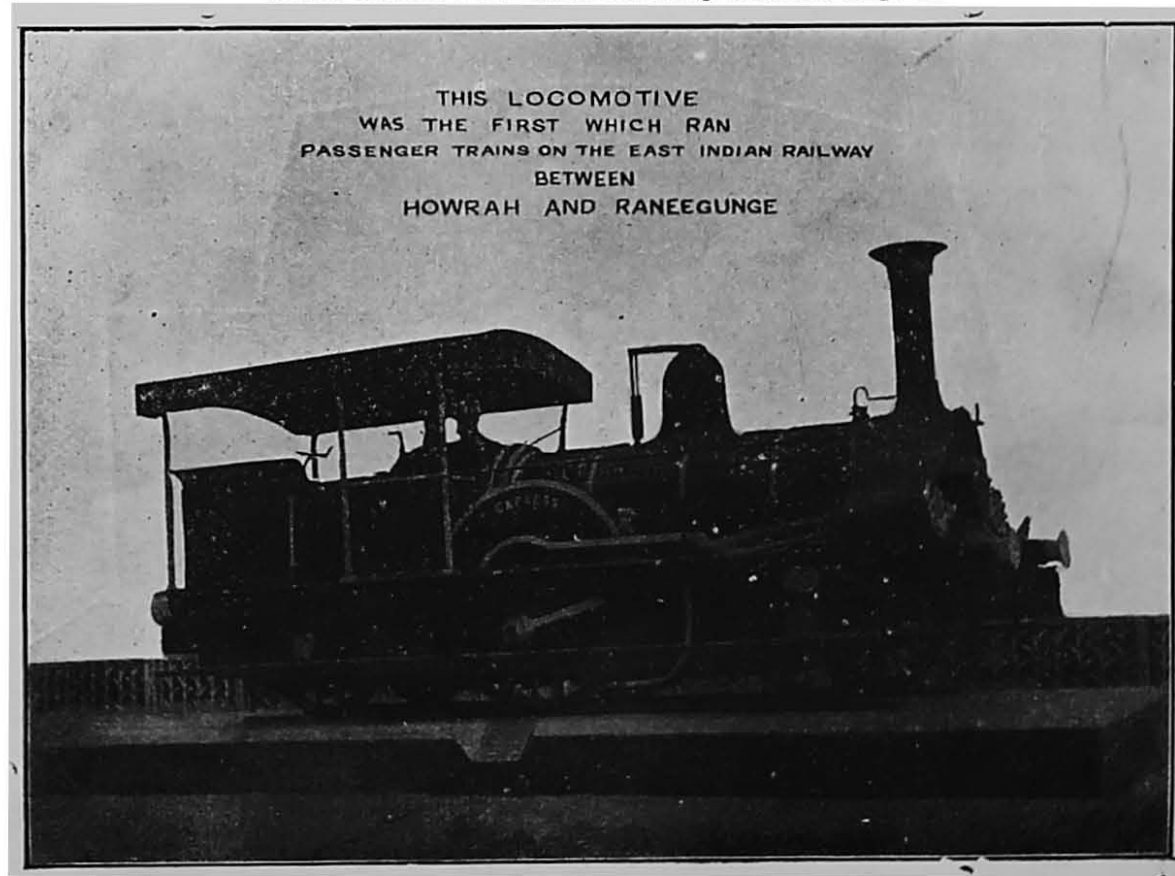
During the period from April to December 1920 the East Indian Railway was an average nett debtor railway to the extent of approximately 3,203 wagons and the Bengal-Nagpur Railway to the extent of 1,534 wagons, while during the first three months of 1921 the East Indian Railway was an average nett debtor railway to the extent of approximately 4,514 wagons and the Bengal-Nagpur Railway to the extent of 2,845 wagons. These nett debits represent the assistance given to the two coal despatching railways by their connected railways, and in order to give this assistance these railways had to restrict their own traffic. Similarly, in order to maintain the supply of wagons in the coalfields both the East Indian and Bengal-Nagpur Railways and especially the former, had also to restrict their general merchandise traffic.

**Standard of
Convenien-
ces.**

7. There is one other point in regard to rolling-stock which merits a word of mention. The columns of the public press have in recent times contained a great many complaints in regard to the comforts, conveniences and adequacy of accommodation in trains on various lines. Although it is not suggested that finality has been reached in respect of necessary improvements, it is instructive occasionally to look back on the past in order to obtain some idea of the progress which has been effected. This issue of the Administration Report, therefore, contains some illustrations of the early types of carriages and locomotives in use on Indian lines contrasted with the most modern additions to the stock and for those who are inclined to criticise the scale of comfort now afforded, it may be useful to contemplate what sufficed for the simple needs of our predecessors half a century ago. It will be noticed that the old third class coach was double storied, there being insufficient head room to allow the passengers to stand upright. The latest third class coaches are equipped with electric light and sanitary conveniences, while provision for third class refreshments and a supply of good water have added appreciably to the comforts of the travellers. The discomfort due to overcrowding of trains on busy sections is a trouble from which India in common with the rest of the world is suffering largely as a result of the war and which it is hoped will gradually disappear with the increase in passenger stock and the equipment of the lines in congested areas to carry a more extended service.



Great Indian Peninsula Railway modern engine.



**East Indian Railway
old engine.**

CHAPTER IV.

Working Expenses.

(See Appendices 6, 12, 13 and 15 of Volume II.)

The abnormal increase in working expenses of railways which has taken place in recent years is a matter of very great concern to those who are responsible for the administration. It is also a question in which the public is very intimately interested, since, unless some counteracting method can be devised, the result must eventually be reflected in a rise in the cost of transport or in other words in increased rates and fares. The figures of revenue and working expenses for the last ten years are as below :—

Year.	Gross earnings.	Working expenses.	Percentage of working expenses to gross earnings.
	Rs.	Rs.	
1911	55,27,78,000	28,83,88,000	52.17
1912	61,65,04,000	30,15,88,000	48.92
1913-14	63,58,51,000	32,92,89,000	51.79
1914-15	60,42,74,000	32,75,04,000	54.19
1915-16	64,66,04,000	32,91,95,000	50.91
1916-17	70,68,42,000	33,40,32,000	47.26
1917-18	77,36,39,000	35,36,87,000	45.72
1918-19	86,28,68,000	41,80,17,000	48.45
1919-20	89,15,32,000	50,65,65,000	56.81
1920-21	91,98,76,000	60,29,04,000	65.54

It will be noticed that prior to the war the percentage of working expenses to earnings oscillated about an average of 50. In the later war years the proportion fell, owing to the fact that both repairs and renewals were suspended, because materials could not be obtained and this special cause served to mask the fact that the cost of working was already on the

increase. With the cessation of hostilities, the full effect of this was quickly apparent in a rise to nearly 57 in 1919-20 which was followed by 65½ in the year under review. It is probable that the high water mark has not yet been reached and 1921-22 will show an even higher proportion. It is obvious, therefore, that if railways are to maintain their former financial status, the Railways must be prepared either to check this tendency by economy or to neutralise it by increased earning capacity. The actual financial position of railways as a whole will be dealt with in a subsequent chapter.

**Main Heads
of expendi-
ture.**

2. The present chapter deals only with the possibilities of the first alternative and in considering the question of economy, it is necessary in the first place to know on what objects the money is spent. The summary below shows the actual distribution of the working expenses for the year 1920-21 between the various spending departments.

Department.	Work.	Amount spent.	Percentage of total expenses.
		Rs.	
Engineering	Maintenance of way, works and stations.	11,94,88,000	19.82
Locomotive	Maintenance and renewing of engines and cost of fuel and running stores and other expenses attached to provision of motive power.	20,87,68,000	34.62
Carrriage and Wagon	Maintenance and running of carriages and wagons.	7,30,55,000	12.12
Traffic	Working of trains from a business standpoint, i.e., booking of passengers and goods and arrangements for transport.	10,61,05,000	17.60
Agency and others	Agent's Office expenses, Audit, Stores, Medical and Police charges, etc.	4,69,78,000	7.79
Ferry	Steam boat expenses	31,37,000	0.52
Miscellaneous	Law charges, compensation, contribution to Provident Fund, etc.	*4,53,73,000	7.53
	Total	60,29,04,000	

* Includes Rs. 11,96,000 on account of total working expenses of certain smaller lines for which details by departments are not available.

**Expendi-
ture on**

3. Taking these heads seriatim, the expenditure under Maintenance of Way is certainly unduly high, but this is due to special repairs and renewals.

which have become necessary as a result of neglect during the war. The result of arrears in this respect is evident in slower timings of trains, speed restrictions especially over bridges, etc., all of which militate against satisfactory working. It is probable, therefore, that no economy in this direction will be possible for at least 3 or 4 years.

maintenance of way, works, etc.

4. The next two heads, Locomotive and Carriage and Wagon, provide for the actual trains and include one very important item, *viz.*, fuel. Railways in India required for their consumption during the year 6 million tons of coal and the price at the pit's mouth has risen from a pre-war rate of about Rs. 4 per ton to Rs. 5 or over per ton and is still rising. Apart from this question of price the actual deliveries have been deficient. This question involves considerations of great importance which will be specially dealt with in subsequent paragraphs. Beyond this matter of fuel the Locomotive and Carriage and Wagon expenditure includes a large provision for repairs and renewal of rolling-stock which it is impossible to reduce. In this connection it may, however, usefully be borne in mind that every additional requirement added to the stock increases the cost of repairs and renewals and if this item of annual expenditure is to be kept down it is impossible to make continual improvements. This applies very particularly to passenger stock where the added requirements now demanded do not add anything to the earning capacity and very sensibly augment the expenses.

Expenditure by Loco., Carriage and Wagon Departments.

5. The Traffic Department is one in which the public is most directly concerned and the heavy rise in expenditure is mainly or wholly a question of staff. The rise in wages is, of course, inevitable; but it will help in many railway difficulties if the public fully realise that the grant of unreasonable demands under pressure of strikes or public support is a matter for which the public must eventually themselves pay in increased rates and fares.

Traffic expenses.

6. In reviewing for comparative purposes the figures of working expenses of individual lines given in Appendix 12 of Volume II, there is one particular fact which it is important should be borne in mind. In a country of the size of India, conditions affecting working expenses differ so widely that comparisons simply on the basis of results are apt to lead to very erroneous conclusions. For example, the proximity of the coal-fields in Bengal and Bihar and Orissa constitutes a very important advantage to lines operating in those areas, and it is impossible to expect for this reason that the cost of haulage on the North Western Railway, Madras and Southern Mahratta Railway or South Indian Railway will compare with that on East Indian Railway and Bengal-Nagpur Railway. The practical effect of this factor will be apparent from the interesting diagram produced at the end of this chapter. Similarly grades, population, climate, variations in wages, distance from ports, are all factors which have got to be taken into consideration. These facts are perhaps very self-evident and are only mentioned because they appear to be often overlooked in public criticisms of comparative working of different lines.

Factors affecting expenses on various lines.

Relative importance of main avenues of expenditure.

7. In order that the relative importance of the main avenues of expenditure on different lines may be apparent the results for last year have been collected in the following summary:—

(FIGURES IN CRORES OF RUPEES.)

Principal Railway system.	Staff.	Maintenance of property.	Fuel.	Other expenses.	Total.
North Western	4.61	2.63	1.34	2.24	10.82
Eastern Bengal	1.77	0.49	0.23	0.59	3.08
Oudh and Rohilkhand	0.79	0.65	0.16	0.34	1.94
Bombay, Baroda and Central India	3.43	1.25	0.85	1.71	7.24
Great Indian Peninsula	4.76	2.44	1.19	2.34	10.73
Madras and Southern Mahratta	1.75	1.27	0.55	0.67	4.24
Bengal-Nagpur	2.04	0.97	0.20	1.03	4.24
East Indian	3.39	2.17	0.34	1.76	7.66
Bengal and North-Western	0.59	0.30	0.12	0.19	1.20
South Indian	1.30	0.50	0.53	0.46	2.79
Burma	1.00	0.45	0.44	0.34	2.23
Assam Bengal	0.43	0.20	0.08	0.17	0.88
Rohilkund and Kumaon	0.14	0.07	0.03	0.05	0.29
Nizam's Guaranteed State	0.42	0.26	0.07	0.05	0.80
Jodhpur-Bikaner	0.26	0.14	0.09	0.15	0.64
Total	26.68	13.79	6.22	12.09	58.78

It will be noticed from these figures that the relative proportion of expenditure in different heads varies widely on different lines for reasons which have already been referred to. It is impossible within the compass of this report to attempt any analysis of these results; but one outstanding feature common to all is apparent. Taking all lines together, about half of the working expenses are represented by payments to the staff. On some lines with a small volume of traffic the proportion is even higher. It is evident, therefore, that the question of wages and other expenses connected with the welfare of the staff is of the first importance in consideration of possible economy in working and this matter is specially dealt with in the next chapter.

Maintenance of property.

8. Turning then to the remaining heads a small preliminary explanation is perhaps necessary in regard to the provision for maintenance of the property as the method employed on Indian railways is rather different to what is usually adopted in a private industrial concern and the facts in this respect have an important bearing on our present financial position. An

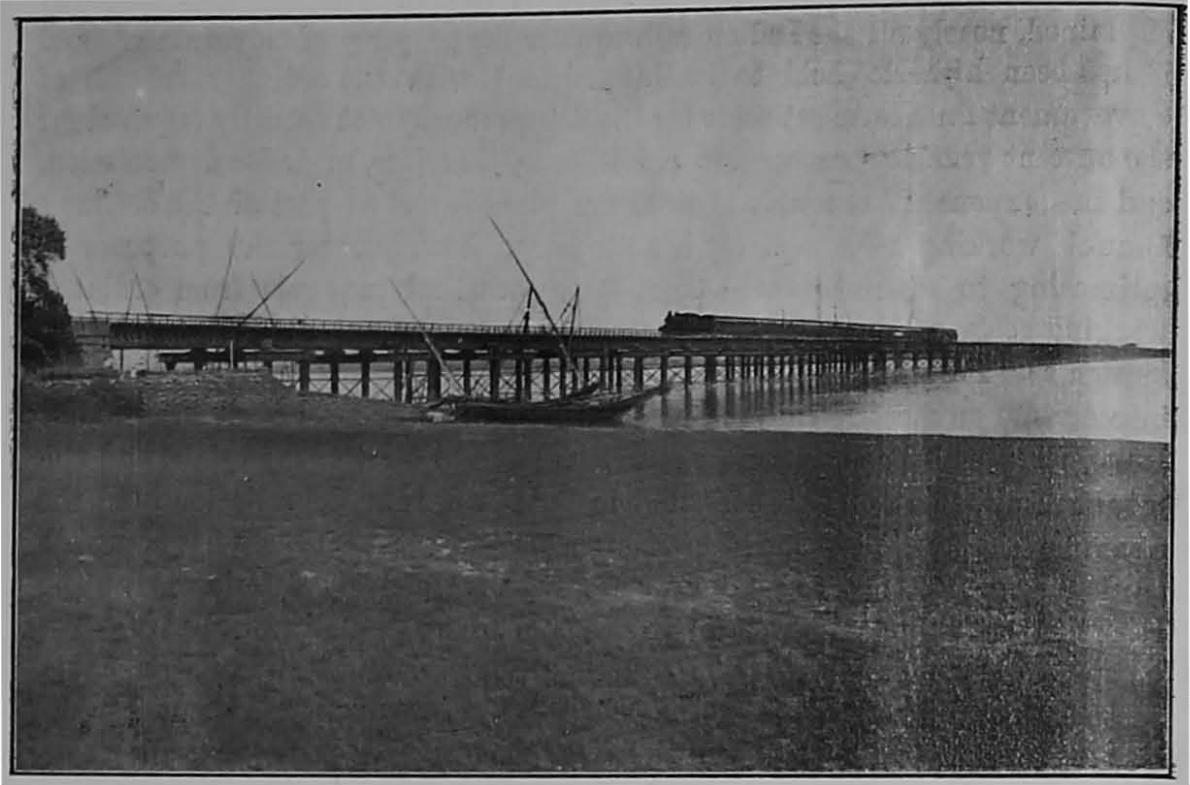
ordinary commercial concern provides for depreciation of its property by setting aside annually a certain portion of the profits for credit to a depreciation fund which is charged with renewals as they are made. As already explained, nearly all the Indian railways are the property of Government and it has been hitherto held to be inconsistent with the ordinary scheme of Government finance to set aside for the future money not actually required for the current year's expenses. No provision is, therefore, made for depreciation, and the expense of renewals of worn out plant is met as part of the ordinary annual working expenses. It is customary, however, for the purposes of estimating to separate the cost of these periodical renewals from ordinary working costs and repairs and the sum devoted specially to this purpose is known as "Programme Revenue." During the war even ordinary repairs fell into arrears on most railways; but it is this particular head of "Programme Revenue" which suffered most severely owing to want of materials, and the actual result, therefore, has been that, in the absence of a depreciation fund, the revenue that would ordinarily have been spent for this purpose has served to swell the surplus and the capital assets have progressively deteriorated. The result is that a sum considerably in excess of what is usually necessary must be spent in the next few years and the expenditure on this account is again further increased by the high prices. The sums provided and spent in the last 8 years for this purpose will illustrate the above.

							Provision.	Expenditure.
							Rs. (in crores.)	Rs. (in crores.)
1913-14	...	...	...	..	...	...	3·68
1914-15	...	..	...	...	...	...	3·30
1915-16	...	...	...	...	...	...	2·82
1916-17	...	...	...	...	...	2·50	2·20
1917-18	...	...	...	...	...	3·30	1·54
1918-19	...	...	...	...	...	4·67	2·00
1919-20	...	...	...	...	...	9·75	3·59
1920-21	...	...	...	...	...	10·75	5·30

It will be noticed that in the years immediately following the war the liberal provisions made were not utilized owing to the unfortunate failure of supplies from England and it has not been possible to make up the leeway as quickly as was hoped.

Of the sum spent in the year under review, nearly one-half was devoted to renewal of rolling-stock and the other half to open line works—the replacement of worn out rails, sleepers and bridges, etc. The most important

bridges which are being rebuilt are those at Bassein on the Bombay, Baroda and Central India Railway of which an illustration is given.



Bassein bridges, Bombay, Baroda and Central India Railway.

Fuel.

9. The remaining item, fuel, has, in recent years, become a matter of considerable anxiety owing to the rise in price and actual shortage of supply. The proportion of the various kinds of fuel used on Indian railways during the last 10 years is shown in the summary below :—

Year.	Foreign coal.	Indian coal.	Wood.	Oil Fuel.	Total.
	Tons.	Tons.	Tons.	Tons.	Tons.
1911	32,132	4,223,019	132,860	...	4,388,011
1912	118,582	4,590,618	120,579	...	4,829,779
1913-14	298,582	4,702,075	106,412	515	5,107,584
1914-15	89,211	4,946,375	95,598	1,935	5,133,119
1915-16	40,959	5,143,108	112,732	2,638	5,299,437
1916-17	13,162	5,489,443	119,218	6,796	5,628,619
1917-18	3,620	5,616,725	243,450	29,800	5,893,595
1918-19	964	5,380,165	335,499	48,014	6,264,642
1919-20	860	6,055,492	322,422	53,018	6,431,792
1920-21	586	6,287,063	214,909	63,828	6,566,391

It will be seen that the quantity of foreign coal used in the last few years is negligible and that the Indian railways have depended more and more on the Indian supply supplemented by wood and more recently by oil.

10. The use of oil fuel in India is still in its infancy. The experiments hitherto made have, however, proved to be successful and steps are being taken to make use of oil as fuel on engines on an extensive scale. Arrangements have been made for the supply of nearly a quarter of a million tons of oil fuel annually which will be used on the North Western Railway and the Great Indian Peninsula Railway. The latter railway had converted for oil fuel at the end of the year about 40 locomotives and had in hand the erection of 30 new powerful engines suitable for use of oil fuel. As was mentioned in last year's report the North Western Railway have converted 129 Engines for use of oil and have made provision for a corresponding storage of fuel. Oil Fuel.

11. The expenditure during the last 7 years on fuel on State-owned railways (including private owned lines worked by them) was as follows:— Cost of Fuel.

						Rs. (in crores.)
1914-15	...	...	...	...	...	4.25
1915-16	...	...	...	...	...	4.01
1916-17	...	...	...	...	...	4.15
1917-18	...	...	...	...	...	4.29
1918-19	...	...	...	...	...	5.05
1919-20	...	...	...	...	...	5.68
1920-21	...	...	...	...	...	5.80

12. In order to ensure an adequate supply of coal at reasonable rates, railways have in some cases acquired collieries of their own and at the close of the year 1920-21, there were seven such collieries being worked by the railways. The most important of these are the Kurhurbaree and Serampore colliery which has an output of nearly 750,000 tons of coal per annum and the Bokharo-Ramgarh Colliery which has an output of nearly 500,000 tons. The table below shows the details of working of State collieries:— Railway Collieries.

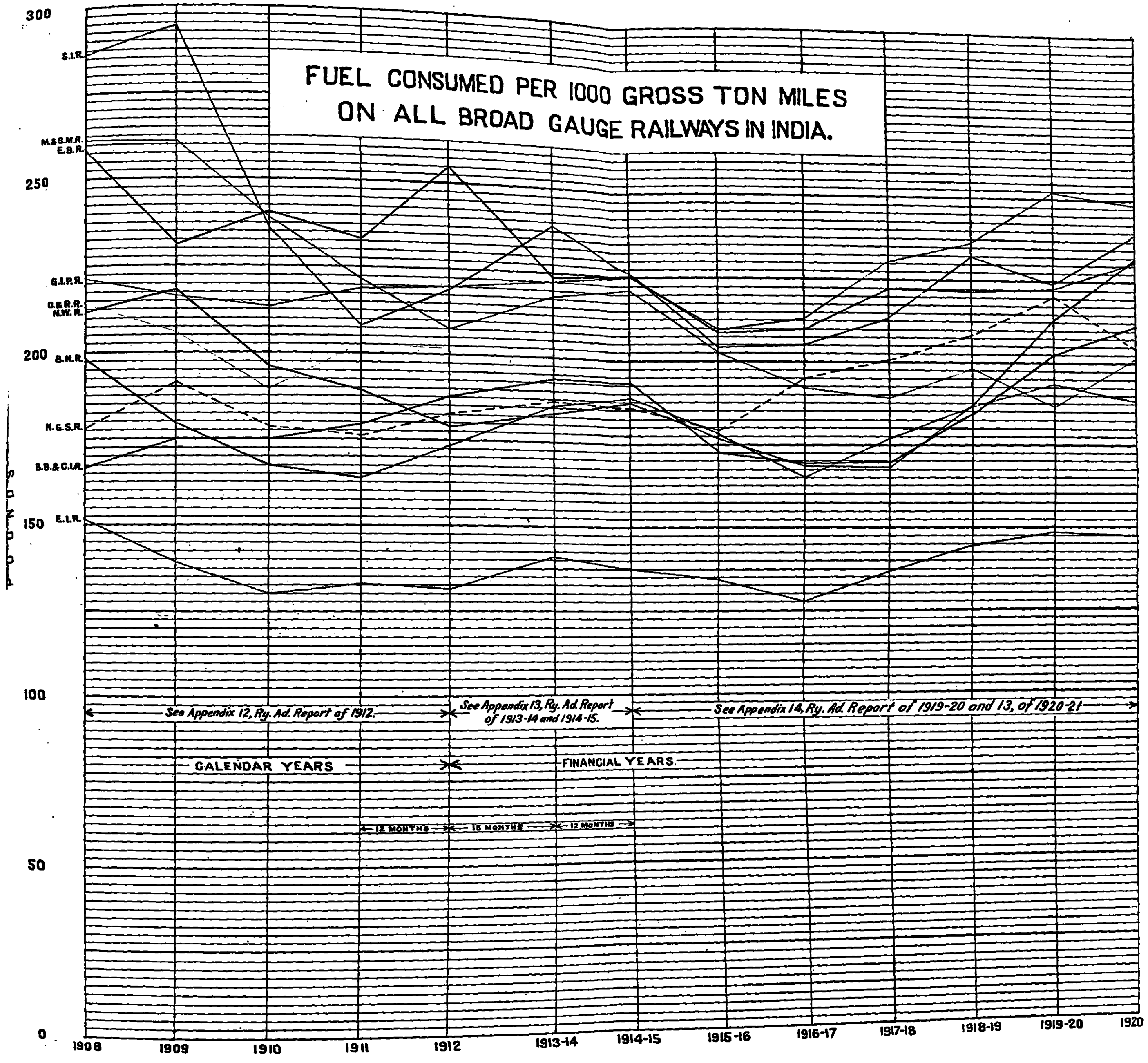
Colliery.	Working Agency.	Capital outlay.	Output.
		Rs.	Tons.
Bokharo-Ramgarh	East Indian and Bengal-Nagpur Railways...	16,81,978	488,825
Kurhurbaree and Serampore	East Indian Railway	20,47,242	744,404
Mohpani	Great Indian Peninsula Railway	10,18,995	85,061
Kargali	Great Indian Peninsula Railway	21,57,204	329,946
Khost	North Western Railway	2,76,190	18,206
Khost pressed fuel factory	ditto	27,358	10,877
Sor	ditto	9,98,876	649
	Total	91,07,852	1,677,968

It will be seen that for a total capital outlay of over 91 lakhs of rupees railways obtained over 1½ millions tons of coal which represents one-fourth the total quantity consumed by locomotive engines during the year under review.

**Inferior
coals.**

13. As was stated in the last year's report the question of utilising railway purposes certain classes of inferior coals available in India has been engaging attention. During the year under review, further efforts were made in this direction. An officer was deputed to investigate the use of pulverised fuel coal in America. His report was not very encouraging in that it showed that repeated experiments had not resulted in any extensive use in locomotives. Experiments are, however, still being continued to ascertain results under Indian conditions. A report has also been obtained on the briquetting of inferior coal in Germany. The difficulty in India is the lack of a binding material and it had been reported that a new process in use in Germany would get over this difficulty. Enquiry proved, however, that there was little hope of the processes in use being applicable to the description of inferior coal available in India.

FUEL CONSUMED PER 1000 GROSS TON MILES ON ALL BROAD GAUGE RAILWAYS IN INDIA.



See Appendix 12, Ry. Ad. Report of 1912.

See Appendix 13, Ry. Ad. Report of 1913-14 and 1914-15.

See Appendix 14, Ry. Ad. Report of 1919-20 and 13, of 1920-21.

CALENDAR YEARS

FINANCIAL YEARS.

← 12 MONTHS → ← 15 MONTHS → ← 12 MONTHS →

CHAPTER V.

RAILWAY STAFF.

(See Appendices 23 and 25 of Volume II.)

The total number of railway employes at the close of the year 1920-21 was 751,752 of which 6,901 were Europeans, 11,699 Anglo-Indians and 733,152 Indians. The increase during the last 10 years is shown in the table below:—

Year.	Europeans.	Anglo-Indians.	Indians.	Total.
1911	7,685	9,872	545,337	562,894
1912	7,850	10,066	571,506	589,422
1913-14	7,986	10,437	614,882	633,305
1914-15	7,641	10,349	582,493	600,483
1915-16	7,274	10,412	607,919	625,605
1916-17	6,907	10,425	619,202	636,534
1917-18	6,802	10,239	636,967	654,008
1918-19	6,702	10,450	667,824	684,976
1919-20	6,943	10,866	695,269	713,078
1920-21	6,901	11,699	733,152	751,752

2. In dealing with a great body of labour of this sort including every variety of skilled and unskilled workmen, it is impossible, within the compass of this report, to enter into any detailed explanation of the various measures which have been adopted to improve the pay and prospects to compensate for the increased cost of living. Perhaps, however, a comparison of the total cost of staff in respect of salaries, wages, allowances, etc., on the various lines as it was before the war and in the year under review which is

Improvements in pay and prospects.

given in the following summary, will convey some idea of the magnitude of the figures involved :—

Name of Railway system.	1913-14.	1920-21.
	Rs.	Rs.
Assam-Bengal	25,66,744	43,05,087
Bengal-Nagpur	1,03,00,039	2,04,41,518
Jodhpur Bikaner	11,80,875	25,88,148
Bombay, Baroda and Central India	1,50,77,404	3,43,17,434
Burma	65,07,429	1,00,25,568
East Indian	1,97,58,139	3,38,59,589
Eastern Bengal	98,85,364	1,76,78,409
Great Indian Peninsula	2,12,84,133	4,76,35,884
Bengal and North-Western	37,83,849	58,00,948
Madras and Southern Mahratta	1,02,45,180	1,75,32,252
Nizam's Guaranteed State	26,64,724	42,43,019
North Western	2,35,45,323	4,60,59,348
Oudh and Rohilkhand	49,47,001	78,57,328
Rohilkund and Kumaon	9,52,021	13,93,327
South Indian	73,52,934	1,30,04,503
Total	14,00,51,159	26,68,02,362

It will be seen that the wages bill has nearly doubled since 1913-14. But the concessions which have been made to the staff have extended to many other matters besides pay and in every case heavy additional recurring expenditure has been involved.

Grain shops.

3. In order to ensure a sufficient supply of food to the staff at places where actual shortage existed and to check profiteering at their expense, grain shops have been opened on all lines where this appeared necessary, the grain being bought in bulk from railway funds and retailed at reasonable rates to employes. This was intended only as a temporary expedient to meet special conditions following the war and it is hoped that it may shortly be discontinued or its place taken by a parallel organisation carried on by co-operative effort among the staff themselves.

Provident fund and gratuity benefits.

4. In order to help employes to make a more adequate provision for their retirement and to provide for their dependents in case of death, the rules governing Provident Fund and Gratuities have been very substantially improved. The present cost of these concessions may be judged from the facts that in the year under review railways paid to their staff in the form of gratuities Rs. 26 lakhs and credited about 60 lakhs of rupees to Provident Funds as bonuses.

5. These represent direct concessions but there are many other ways in which indirect financial and material help is now being afforded. As already mentioned a very large sum of money is being spent on quarters and much more remains to be done. Railway colonies equipped with good water supply, and in many cases electricity, have been started at large centres. Institutes or other forms of recreation are provided or assisted from railway funds. The question of increasing facilities for education of children is receiving attention. Co-operative Credit Societies have on many lines been started to assist in cases of temporary distress.

**Other
indirect
benefits.**

6. These facts will serve in some measure to correct the impression which has, perhaps, been conveyed to the public in connection with some of the recent regrettable agitations among the staff that the railway authorities have been unmindful of the welfare of their employés. Labour unrest is a phenomenon which is unhappily not peculiar to India at present. But when this unrest develops to the extent of causing strikes on railways it is the public who are the principal sufferers, and it is important, therefore, that ill-informed public criticism shall not unconsciously foment difficulty when adequate reason does not really exist. In the year under review strikes have unfortunately occurred on the Bombay, Baroda and Central India Railway, the Burma Railways, the Dibru Sadiya Railway, the East Indian Railway, the Great Indian Peninsula Railway, the Madras and Southern Mahratta Railway and the North Western Railway. No object would be served by attempting to review the causes of the difficulty in each case or the measures taken to meet them. In many cases an unfortunate political element has been imported into the matter. The strike of most importance was that which occurred on the North Western Railway when practically all the Indian employés of the Locomotive and Carriage and Wagon Shops at Moghalpura and a number of the station staff were away from duty for the months of April and May 1920.

Strikes.

7. So far the description of measures adopted for relief has referred principally to the subordinate staff of the railways. But it is obvious that the rise in the cost of living has affected all classes equally, though the claims of the better paid officers were, perhaps, in the first instance, less urgent. Measures to improve rates of pay have, however, now been carried out in all services.

**Superior
Staff.**

During the year 1920-21 the engineer establishment of State-worked railways was reorganised as a result of the recommendations of the Public Services Commission and in view of the necessity for placing officers in a position to meet the present day cost of living. The Imperial and Provincial services as hitherto existing were amalgamated into one service designated the State Railway Engineer service on revised rates of pay based on time-scale. Sanction was also accorded to the formation of a new service of Assistant Engineers to serve as Sub-District officers. Similar reorganisations with revised rates of pay based on the engineer scale have

been introduced for the Locomotive, Carriage and Wagon, Electrical, Traffic and Stores Departments of the Superior Revenue Establishment and a new Local Traffic Service, modelled on the lines of the Provincial Engineer Service, has been sanctioned. The rates of pay of the superior establishment of most of the larger Company-worked railways have been reorganised on the lines adopted for State-worked railways and the Government services generally.

**Mechanical
Training.**

8. Before leaving the question of staff there is one other matter which must be mentioned. Railways are peculiarly dependent in their mechanical services on an adequate supply of skilled workmen. Hitherto very little organised effort has been made to provide for the training of educated Indians in mechanical engineering though the training of apprentices in workshops on a limited scale was usual. Regular schemes for this purpose have recently been drawn up for the three State Railways and Companies' lines are taking similar measures which, it is hoped, will eventually be of great assistance in helping to increase the supply of skilled mechanical labour—a matter of very great importance both to railways and industrial India generally. The resolution issued by the Government of India on the subject of training of educated Indians in mechanical engineering is reproduced as Appendix D to this volume.

CHAPTER VI.

EARNINGS.

(See Appendices 5, 9, 11, 14 and 24 of Volume II.)

The total gross earnings of all railways in India in 1920-21 were Rs. 91,98,76,000, representing an increase of Rs. 2,83,44,000 over the previous year. The results attained fell short of what it was hoped would be realised when the budget was framed, owing in a large measure to the trade depression referred to in the introductory chapter.

Total gross earnings.

2. The growth of earnings affords a direct index of the development of railways and important facts can be deduced from the study and analysis of past results. The figures for the last 11 years are as below :—

Growth of earnings.

Year.	Gross earnings.	Increase over previous year.	Percentage of increase.
	Rs.	Rs.	
1910	51,14,22,000	...	...
1911	55,27,78,000	4,13,56,000	8.08
1912	61,65,04,000	6,37,26,000	11.53
1913-14	63,58,51,000	1,93,47,000	3.14
1914-15	60,42,74,000	-3,15,77,000	-4.96
1915-16	64,66,04,000	4,23,30,000	7.00
1916-17	70,68,42,000	6,02,38,000	9.31
1917-18	77,36,39,000	6,67,97,000	9.45
1918-19	86,38,68,000	8,92,29,000	11.53
1919-20	89,15,32,000	2,86,64,000	3.32
1920-21	91,98,76,000	2,83,44,000	3.18

For comparative purposes, the figures during the war are to a considerable extent vitiated by the special conditions then obtaining. The decrease in 1914-15 was of course directly attributable to the cessation of trade which followed the opening of hostilities, and to some extent the heavy increases in subsequent years were attributable to the military and other special traffic engendered by the war. Taking, however, the period as a whole it will be noticed that the earnings have increased in 10 years by Rs 40,84,54,000 or 79.86 per cent., and it is of considerable interest to see how this has been effected.

**Goods
Traffic
earnings.**

3. Taking first the goods figures :—

Year.					Goods earnings.	Increase over previous year.	Percentage.
					Rs.	Rs.	
1910	...	...	...	...	30,43,17,000	...	...
1911	...	...	...	...	32,93,22,000	2,50,05,000	8.22
1912	...	...	...	...	37,91,84,000	4,98,62,000	15.14
1913-14	...	...	...	...	37,77,49,000	-14,35,000	-0.38
1914-15	...	...	...	...	35,09,18,000	-2,68,31,000	-7.10
1915-16	...	...	...	...	38,75,79,000	3,66,61,000	10.45
1916-17	...	...	...	...	41,43,00,000	2,67,21,000	6.89
1917-18	...	...	...	...	44,49,54,000	3,06,54,000	7.40
1918-19	...	...	...	...	49,13,89,000	4,64,35,000	10.44
1919-20	...	...	...	...	47,11,60,000	-2,02,29,000	-4.11
1920-21	...	...	...	...	47,96,84,000	85,24,000	1.81

The special fluctuations during the war years may be neglected, but between 1910 and 1920-21 the increase was Rs. 17,53,67,000 or 57.62 per cent.

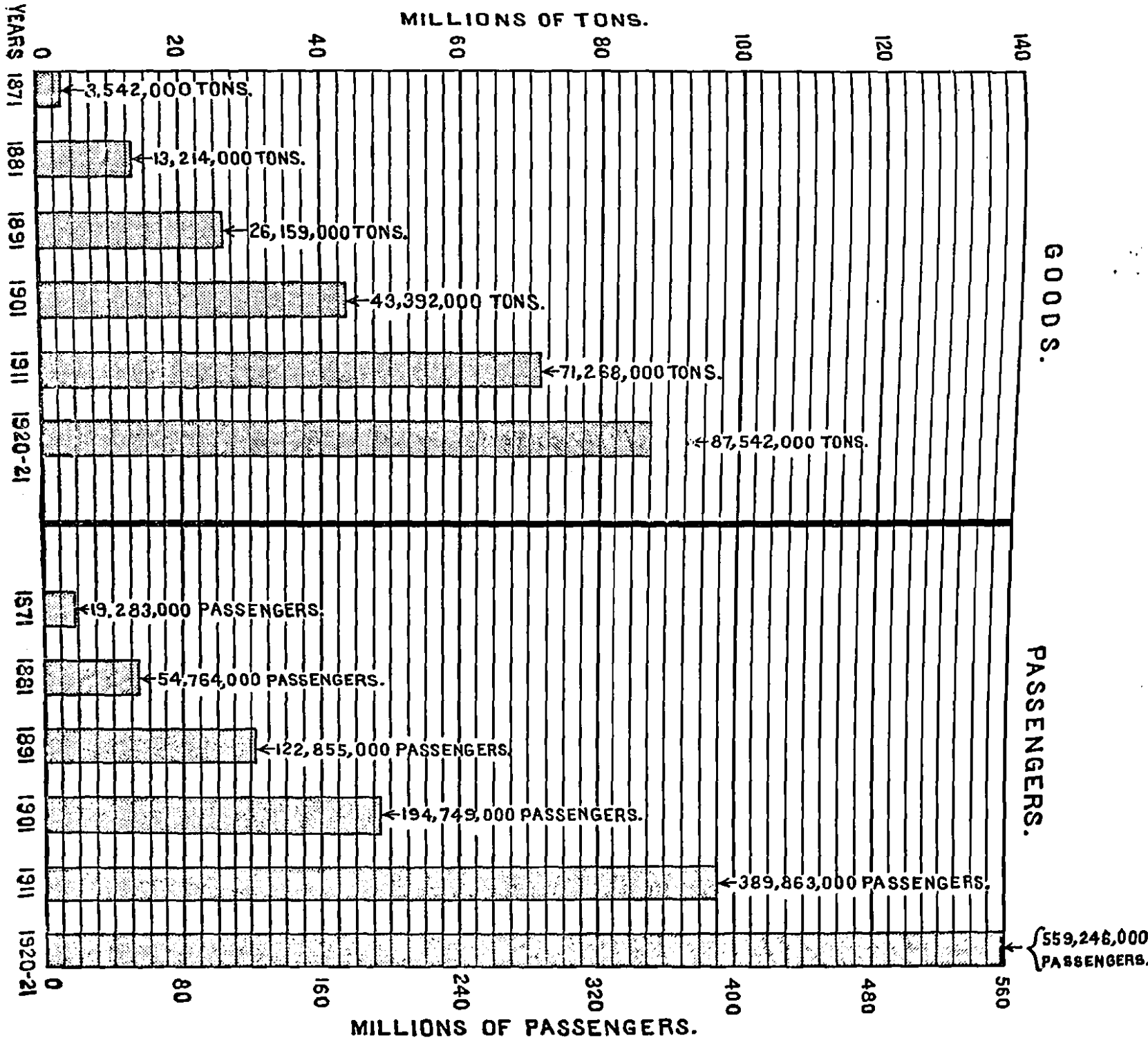
**Passenger
Traffic
earnings.**

4. The corresponding figures for passengers are as below :—

Year.					Passenger earnings.*	Increase over previous year.	Percentage.
					Rs.	Rs.	
1910	...	...	...	...	19,17,42,000	...	...
1911	...	...	...	...	20,84,05,000	1,66,63,000	8.69
1912	...	...	...	...	21,96,39,000	1,12,34,000	5.39
1913-14	...	...	...	...	23,73,69,000	1,77,30,000	8.07
1914-15	...	...	...	...	23,44,26,000	-29,43,000	-1.24
1915-16	...	...	...	...	24,14,00,000	69,74,000	2.97
1916-17	...	...	...	...	27,05,95,000	2,91,95,000	12.09
1917-18	...	...	...	...	30,17,05,000	3,11,10,000	11.49
1918-19	...	...	...	...	34,20,16,000	4,03,11,000	13.36
1919-20	...	...	...	...	39,06,93,000	4,86,77,000	14.23
1920-21	...	...	...	...	40,85,23,000	1,78,30,000	4.56

* Including earnings from parcels, luggage, etc.

DEVELOPMENT OF GOODS & PASSENGER TRAFFIC DURING THE LAST FIFTY YEARS.



It will be noticed that throughout this period the progressive rate of increase in each year has with the exception of 1912 and 1915-16 exceeded that of goods and the final result is to show an increase of Rs. 21,67,81,000 or 113.06 per cent. in the 10 years' period.

5. Taking figures further back still the following are the results :—

Year.	GOODS.		PASSENGER.	
	Tonnage.	Earnings.	Number.	*Earnings.
		Rs.		Rs.
1901	43,392,000	21,23,67,000	194,749,000	11,41,88,000
1911	71,263,000	32,93,22,000	389,862,600	20,84,05,000
1920-21	87,542,000	47,96,84,000	559,246,100	40,85,23,000

Phenomenal growth of passenger traffic.

It appears from this that the goods earnings have rather more than doubled in 20 years, while passengers have almost trebled in number and nearly quadrupled in earnings in the same period. The conclusion, therefore, which follows from this analysis is that the passenger traffic is definitely increasing faster than the goods, which besides being an important testimony to the increased prosperity of the people, is a fact of very great importance in respect of railway policy. It is perhaps not generally known that when railways were first started in India the opinion was confidently expressed that very little provision for passenger traffic would be required since caste difficulties would prevent the railways from being generally used by the people. The figures of progressive development given below furnish an interesting commentary on this view of the possibilities of railways in India.

	Number of passengers.			
1871	19,283,000
1881	54,764,000
1891	122,855,000
1901	194,749,000
1911	389,862,600
1920-21	559,246,100

6. In spite, however, of the increased value of passenger traffic, goods traffic is still in the year under review the more important item from the stand-point of revenue.

Relative importance of goods traffic earnings.

* Including earnings from parcels, luggage, etc.

The earnings are as below :—

	Earnings.	Per cent. of total earnings.
	Rs.	
Goods traffic	47,96,84,000	52·15
Passenger	*40,85,23,000	44·41
Miscellaneous, telegraph, steam-boat, etc....	†3,16,69,000	3·44
Total ...	91,98,76,000	100·00

Earnings
per mile
per week.

7. In respect of the total figures, it is interesting to notice the progressive development of earning capacity which is a valuable index of the corresponding development in material prosperity of the areas served. The following are the figures of earnings per mile per week for all lines in the last 30 years.

1890	243
1900	245
1910	306
1920-21	478

Analysis
of goods
traffic.

8. Turning now to the separate items, the earnings under goods in the year under review were made up as follows :—

	Quantity.	Earnings.
	Tons.	Rs.
Merchandise General	46,147,000	35,30,25,000
Military stores	1,065,000	96,53,000
Coal and coke for the public and foreign railways ...	21,845,000	8,20,50,000
Revenue stores	18,229,000	2,64,51,000
Live stock	256,000	51,55,000
Other goods ... ..	...	45,52,000
Total ...	87,542,000	†47,96,84,000

* Includes earnings from parcels, luggage, etc.

† Includes Rs. 2,70,000 as the gross earnings of the Aden Railway for which detailed information is not available.

‡ Excludes the Cawnpore-Burhwal link earnings which, in the case of total, are included under sundry earnings.

9. It will be seen from above that the major portion of the earnings is comprised in the general head of merchandise and the principal commodities which go to make up this head are given in the table below which shows the quantities carried and revenue earned in the last five years from carriage of each commodity. Merchandise.

	1916-17.		1917-18.		1918-19.		1919-20.		1920-21.	
	Tons in millions.	Rs. in crores.	Tons in millions.	Rs. in crores.	Tons in millions.	Rs. in crores.	Tons in millions.	Rs. in crores.	Tons in millions.	Rs. in crores.
Grain and pulse ...	13.18	8.65	15.19	10.94	16.45	12.12	13.62	9.45	12.77	9.58
Cotton ...	2.05	3.15	2.02	3.04	1.99	3.20	2.24	4.16	1.99	4.09
Metals ...	2.53	1.52	2.07	1.34	1.98	1.27	2.47	1.55	3.30	2.27
Oil seeds ...	3.03	2.19	2.37	1.76	2.91	2.28	2.68	2.21	2.60	2.21
Jute ...	1.69	1.28	1.68	1.10	1.73	1.41	2.00	1.63	1.72	1.57
Sugar ...	1.97	1.52	2.03	1.73	2.39	2.13	2.01	1.73	1.76	1.53
Salt ...	2.62	1.61	2.44	1.56	2.64	1.73	2.48	1.60	2.24	1.47
Oils ...	1.34	1.11	1.37	1.24	1.24	1.17	1.38	1.41	1.28	1.41
Wood ...	1.95	0.81	2.14	1.03	2.51	1.29	2.35	1.11	2.25	1.03
Others ...	13.80	7.85	12.63	7.68	13.38	8.24	14.53	9.57	16.03	10.14

The effect of the poor trade year and deficient monsoon is clearly reflected in the figures of tonnage lifted of all the principal articles of export—which are below those of the four previous years. Metals and wood have risen probably as a result of internal industrial activity, and the rise in the tonnage of miscellaneous commodities not detailed is due mainly to imports.

10. Apart from general merchandise, the next large item is coal which represents about one-fourth of the total tonnage lifted. The question of supply and transport of this vital commodity has become in recent years a matter of such public concern that it is desirable to explain the position at some length. Coal traffic.

In 1920 the coal mined in India amounted to 17,962,214 tons against 22,628,037 tons in 1919 or a decrease of 4,665,823 tons. The total quantity of coal despatched from the main coal-fields of India was as follows:—

	Tons.
Bengal and Bihar and Orissa collieries ...	15,986,777
Singareni collieries ...	324,767
Pench Valley ,, ...	48,992
Umaria ,, ...	135,155
Total ...	16,495,691

Of this amount 14,944,000 tons were carried by the East Indian and Bengal-Nagpur Railways which is 801,814 tons in excess of the previous year's figure.

The question of general deficiency of supply and the measures taken to conserve it are outside the scope of this report which deals only with matters affecting transport and in this connection there is evidence in the complaints and suggestions appearing in the press of some misunderstanding of the position. It seems to be generally believed that the whole difficulty is one of wagon deficiency, but this is only partially true. Unlimited wagons will not solve the trouble, unless provision can at the same time be made for increased facilities in and around the coal-fields for dealing expeditiously with a larger number of trains. The existing lines have a limited capacity and to overtax that capacity would simply produce a block. More wagons are wanted and measures are being taken so far as financially possible to procure this. In the meantime, with a view to taking full advantage of the existing stock, wagon supply of all broad gauge lines has been pooled with effect from 1st November 1919. This system of pooling wagons has been adopted as an experiment, and so far it has proved a success, but there are certain difficulties in respect of repairs, etc., which have yet to be overcome.

**Coal
transport.**

11. Mention is perhaps necessary of the special temporary system of preferential treatment which has been adopted under the control of a Coal Transportation Officer. This is not a new departure. It is a partial reversion to a system which had been in force prior to the war. When the Coal Special Indent System under which wagons were supplied to collieries on certificates issued under the authority of the Coal Controller (and subsequently the Coal Transportation Officer) was withdrawn on the 31st December 1919, it was intended that the pre-war system of wagon allotment should be reverted to. Unfortunately, however, the wagon supply in the coal-fields continued in defect with the result that it became necessary for the Coal Transportation Officer to grant certificates entitling holders to preferential treatment in the matter of wagon supplies for their coal. This was known as the system of "Special Supply" and was justified in that it ensured essential industries and the more important consumers at least receiving regular supplies of coal. Several attempts were made to relinquish this new form of control, but the poor wagon position on railways generally and the difficulties in the way of effecting any considerable improvement in it, necessitated the continuance, in the public interests, of some form of control. The arrangements introduced in July of the year under review for diverting coal for Western India ports to the rail-cum-sea route *via* Calcutta, made the position somewhat easier. The relief thus afforded, however, was not sufficient to warrant the withdrawal of the "Special Supply System," which continued in operation throughout the year. In February 1921, an Informal Committee was constituted by the Government of India to discuss the difficulties arising out of the coal situation.

in India and to advise as to the best method, in existing circumstances, of allocating railway wagons for the distribution of coal in India. The Committee recommended, *inter alia*, that preference in the matter of wagon supply should be accorded in the order below to the following classes of demands :—

- (1) Locomotive.
- (2) Government shipments, that is, Royal Indian Marine and Locomotive coal for railways which is conveyed by sea.
- (3) Public utility companies.
- (4) Shipment and bunker.

The recommendations of the Committee were subsequently referred to the Coal Transportation Committee, which was appointed by the Government of India, to be used by the latter Committee as a basis on which to work out a new scheme for the distribution of coal wagons which was to replace the X Class or "Special Supply System."

It will be seen, therefore, that the difficulties in regard to distribution of coal in India are not such as are capable of simple and easy solution and that everything possible with existing resources has been done to alleviate the trouble which the shortage of supply must inevitably cause.

12. A matter of considerable concern to the public is the theft of goods in transit which has in recent years shown an unfortunate tendency to increase. The importance of the evil both from the point of view of the public and railways is very fully recognised. The trouble, however, is not peculiar to India. It is the natural outcome of the universal shortage of supplies and the high level of ruling prices and as such has extended to every country in the world. In India, where the distances are great and valuable goods have to travel for days through unfrequented tracts of country, it is a matter of very great difficulty to provide a remedy. It is not, however, to be inferred that measures to check this practice are not being adopted. **Thefts.**

13. During the year under review a Committee was appointed to investigate the working of the railway police and one of the points referred to them was to make recommendations calculated to mitigate or remove the defective arrangements made for the protection of goods in transit and at sheds and transhipment yards. Their recommendations are receiving the consideration of the Government. **Railway Police**

In this connection, it may be stated that the police force employed for the maintenance of law and order on railways and for the protection of railway property is provided by the Civil Department, the railways paying the major portion of the expense incurred. During the year under review, the portion of the total annual cost borne by railway administrations in

India amounted to Rs. 41,23,677 against Rs. 36,11,777 in 1919-20. The total strength of police force employed on railways including watchmen was about 16,000.

Classification of passenger traffic.

14. As already mentioned, the growth of passenger traffic has been phenomenal and the distribution of the number carried by classes is interesting.—

Class.	No. of passengers.	Earnings.	Average miles a passenger was carried.	Average rate charged per passenger per mile.
				Pies.
	No.	Rs.	Miles.	
First	1,148,500	1,30,48,000	130.55	16.72
Second	7,128,500	2,26,49,000	77.81	7.84
Intermediate	11,749,600	1,91,19,000	71.66	4.36
Third	49,280,400	28,91,25,000	38.73	2.92
Season tickets	48,939,100	37,24,000	9.16	1.60
Total	559,246,100	34,76,65,000	37.52	3.18

As is to be expected, the third class considerably out-numbers all the rest put together; but there are some interesting facts in respect of the higher classes. In the year 1916-17 the number of passengers travelling by intermediate class was 14,348,800 which in 1920-21 had fallen to 11,749,600. The corresponding figures of first and second classes show clearly that this result was due to the better class Indian having transferred his patronage to the higher classes as providing greater comfort and privacy. In the lowest class the numbers* travelling in the last 10 years have been as follows:—

1911	348,478,500
1912	375,566,800
1913-14	410,959,800
1914-15	403,558,800
1915-16	413,254,000
1916-17	431,456,200
1917-18	381,016,700
1918-19	404,387,600
1919-20	460,305,800
1920-21	490,280,400

* Excluding the season and vendors' ticket-holders.

15. These figures will explain the reason for the prevailing complaint of overcrowding of trains, when it is remembered that the number of purely third class carriages* in 1913-14 was 15,712 and in 1920-21 was 17,808, an increase of 2,096 only. Moreover, in this connection, it has to be borne in mind that owing to renewals being in arrears an unduly large proportion of the stock is ineffective. The remedy is obvious; but it is a question of time and money. In the meantime, all that is possible is being done in the way of providing a more extensive service of trains. The daily passenger train mileage in March 1921 was in fact 9,000 miles in excess of the figure at the same period of the previous year.

Overcrowding of carriages.

16. In concluding this chapter, some explanation is necessary in respect to the question of increase in rates and fares. During the year under review parcel rates have been increased by 25 per cent. and passenger fares have on some lines been increased to a very small extent. Goods rates have in some cases been enhanced, but nothing in the way of a general increase has been made. The powers of all administrations in this respect are limited by certain maxima which were fixed long ago and which must inevitably be raised to accord with the increased cost of transport now obtaining. India is alone among all nations of the world in having escaped so far a general and extensive rise in railway rates, and it is impossible if railways are to continue to be worked on sound business principles that an increase in rates commensurate with the increased cost of working can be avoided. So far as passengers are concerned the service given is the cheapest in the world as the following statement showing the average receipts per passenger per mile in different countries will demonstrate. Later figures than 1918 for other countries were unfortunately not available, but as rates in other countries have been sensibly increased everywhere in the last two years the discrepancy is probably considerably greater than represented.

Increase in rates and fares.

Statement showing average receipts per passenger mile by railways of different countries calculated in cents (American).

					1918 or 1917-18.	
					Receipts per passenger.	
					mile.	
United of State America	...	...	...	...	2.45	
Holland	...	...	...	...	2.27	
Canada	...	...	...	...	2.10	
South Australia	...	...	...	...	1.44	
Norway, 1916-17	...	...	...	...	1.42	
Switzerland	...	...	...	...	1.33	
New South Wales	...	...	...	...	1.21	
Japan	...	...	...	...	0.67	
India	...	...	...	...	0.515	

* In terms of four-wheelers.

CHAPTER VII.

FINANCIAL RESULTS.

(See Appendix 8 of Volume II.)

high prices on railway finance. Attention has already been drawn, in dealing with working expenses, to the serious rise in the cost of working railways in India, owing to the increase in wages and price of coal and consumable stores. High prices also entail a proportionately heavy recurring increase to the capital at charge for every increase in capital assets and consequent liability for higher interest.

Indirect benefit of railways to tax-payers. 2. State-owned Railways are worked in the interest of the tax-payer on commercial principles. That is to say, it is expected that they will at least meet their working expenses and the interest on the capital expended. Beyond this, they have for some years paid considerable sums into the general exchequer, thereby avoiding corresponding necessity for direct taxation for the general needs of the country. It is, therefore, a matter of very great public concern, when, for any general or permanent cause, a steady increase is apparent on the debit side of the account without a corresponding increase in the receipts. Considered from this point of view, the financial results of railways at present are, therefore, a matter of general interest; and as the subject is unavoidably one of some complexity, a brief explanation of the figures exhibited in the appendices of Volume II may be of some assistance.

Earnings. 3. The total gross earnings during the year under review amounted to about Rs. 92 crores distributed as follows:—

(1) State Railways owned by Government—

	Rs.
(a) Imperial	81,27,46,000
(b) Provincial	1,32,000
	81,28,78,000
(2) District Board Railways	22,96,000
(3) Railways owned by Indian States	3,41,09,000
(4) " " private Companies	7,05,93,000
	91,98,76,000

The financial results of the last three classes of lines mentioned above are mainly the concern of the proprietors themselves. The Government, however, in most cases, provides land free of cost and allows payments to make up with the net earnings of the lines a certain stipulated minimum return on the capital invested, mostly in the shape of rebate from the earnings of its own lines. The net earnings of some of the railways of class (4) are more than sufficient to meet the stipulated rate of interest and on these a proportion of the surplus profits accrues to the Government. The rebate payments are included in the working expenses of the Government lines concerned; the extent to which the other transactions affect the Government appears in the entries against the items under the heads "Subsidized Companies—Repayments of Advances," etc., and "Subsidized Companies—Land," in the table appended to paragraph 6 below.

4. The total earnings of State Railways owned by State, as stated above, were Rs. 81,28,78,000; but the actual total realizations including the receipts in respect of the unrealized earnings of the previous year amount to Rs. 80,99,06,054. The payments on account of working expenses during the course of the year amounted to Rs. 54,52,95,675. The net receipts consequently work to Rs. 26,46,10,379, yielding a return of 4.74 per cent. on the capital expenditure including the premia paid in respect of the purchased railways. **Receipts.**

5. The table below compares the financial results obtained in the working of State-owned railways during the year 1920-21 with those of the previous eight years:— **Financial Results.**

Year.	Capital expenditure including the premia paid in respect of purchased railways to end of the year.	RECEIPTS.			Return on capital.
		Gross receipts.	Deduct working expenses.	Net receipts.	
	Rs. (in crores.)	Rs. (in crores.)	Rs. (in crores.)	Rs. (in crores.)	Per cent.
1913-14	482.83	56.32	29.36	26.96	5.58
1914-15	500.09	54.16	29.53	24.63	4.92
1915-16	507.03	57.26	29.53	27.73	5.46
1916-17	510.10	62.95	29.97	32.98	6.46
1917-18	514.06	68.92	31.36	37.56	7.30
1918-19	520.41	76.26	37.08	39.18	7.53
1919-20	532.90	79.10	45.47	33.63	6.28
1920-21	558.32	80.99	54.53	26.46	4.74

It will be noticed that during the years of the war, the return was appreciably higher than in the pre-war years; this result is attributable to working expenses having been restricted by postponement of repairs, etc. The high rate of working expenses which immediately followed the war was in some measure due to the reaction from this cause and to this extent may be regarded as temporary.

**Net profit
from
Railways.**

6. Beyond working expenses there are, however, a number of miscellaneous liabilities which have to be taken into consideration before the net profit to Government can be ascertained. The ultimate financial position after taking these into consideration is shown in the following table :—

Railways.	IN CRORES OF RUPEES.							
	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.	1919-20.	1920-21.
<i>State-owned Railways.</i>								
1. Net receipts (see preceding table.) ...	26·96	24·63	27·73	32·93	37·56	39·18	33·63	26·46
<i>Deduct.</i>								
2. Share of surplus profits paid to working agencies.	·66	1·04	·91	1·16	1·49	1·90	2·01	1·73
3. Annuity payments in purchase of Railways.	5·07	5·04	5·04	5·04	5·04	5·04	5·04	3·90
4. Sinking funds	·29	·30	·31	·49	·50	·36	·38	·31
5. Interest on debt, viz., on direct capital expenditure by Government and on specific loans issued and liabilities incurred for and in the purchase of Railways.	13·88	14·85	15·23	14·97	15·62	15·71	16·36	15·74
6. Interest on capital contributed by Railway Companies and Indian States towards outlay on State Railways.								
Net gain from State-owned Railways. ...	7·06	3·40	6·24	11·32	14·91	16·17	9·84	4·73
<i>7. Subsidized Coy.s—</i>								
<i>Receipts.</i>								
(a) Repayment of advances and sale of land. ...	·01	·02	·01	·03	·02	·0029	·0011	·0016
(b) Government share of surplus profits. ...	·13	·08	·12	·12	·12	·16	·34	·28
<i>Charges.</i>								
8. Land, etc.	·08	·15	·24	·24	·10	·03	·04	·05
<i>9. Miscellaneous Railway expenditure, viz.,—</i>								
(a) Cost of Office of Railway Board ...	·10	·09	·09	·08	·08	·10	·10	·12
(b) Cost of Office of Accountant-General, Railways.	·02	·02	·02	·02	·02	·02	·02	·02
(c) Survey of lines	·08	·07	·06	·04	·04	·08	·10	·13
(d) Other Miscellaneous Railway expenditure. ...	—27	—05	—14	—13	—06	·24	·59	—91
Net payments or receipts on account of items 7, 8 and 9.	+·13	—18	—14	—10	—04	—31	—51	+·87
Net working profit to Government from all railways.	7·19	3·22	6·10	11·22	14·87	15·86	9·33	5·65

Inasmuch as the payments on account of annuities in purchase of railways and sinking funds include liabilities of a capital nature redeemed through these payments, the figures against working profits shown above understate the real results. To this extent railways are in fact acquiring a capital asset for the future benefit of the country. During the year 1920-21, the redemption of capital effected through the annuity and sinking fund payments amounted to Rs. 1,64,12,400 and the actual net working profit for the year may, therefore, be stated at Rs. 7,28,35,182.

7. It may be explained that the rate of interest employed in the past for the calculation of interest on capital expenditure provided by the Government has been the average rate of interest paid by Government on loans issued for other than specific purposes. With effect, however, from the year 1919-20, in view of the rise in the rate of interest on loans floated by Government, the interest on Railway capital expenditure is worked out by applying to outlay to end of 1916-17 the average rate of interest obtained on Government borrowings up to that period and to subsequent outlay the rate calculated with reference to the amount of loans issued since 1916-17 and the interest paid in respect of them. The following are the rates of interest adopted during the past eight years—

				Rate of interest.
1913-14	...	...	...	3.888 Per cent.
1914-15	...	...	...	3.499 „
1915-16	...	...	...	3.4725 „
1916-17	...	...	...	3.2964 „
1917-18	...	...	...	3.4730 „
1918-19	...	...	...	3.4818 „
			{	
1919-20	...	...		3.4076 „ For expenditure to end of 1916-17, and
			{	
				5.9328 „ For subsequent expenditure.
			{	
1920-21	...	...		3.3252 „ For expenditure to end of 1916-17, and
				5.1979 „ For subsequent expenditure.

8. Summarising, therefore, the following important facts stand out **Summary** from figures given:—

Working expenses have risen from Rs. 29.36 crores in the last year before the war to Rs. 54.53 crores in 1920-21, thus neutralising the whole increase in gross receipts and bringing the net receipts below what they were in 1913-14. In the meantime, the liability of Government in respect

of interest on capital raised has risen, and the net result is to bring the working profit to a figure below what it stood at in 1912-13.

Working expenses alone have absorbed 67·33 per cent. of gross receipts in place of 52·13 per cent. for the year prior to the war, and the additional capital required must be raised at a cost of nearly 6 per cent. in place of the pre-war rate of 3½ per cent.

The significance of these figures will be apparent to all who are interested in the progressive development of a great national asset of the Empire.

RAILWAY EARNINGS & EXPENDITURE ON STATE OWNED LINES IN INDIA.

1920-21.

CHART OF RECEIPTS.

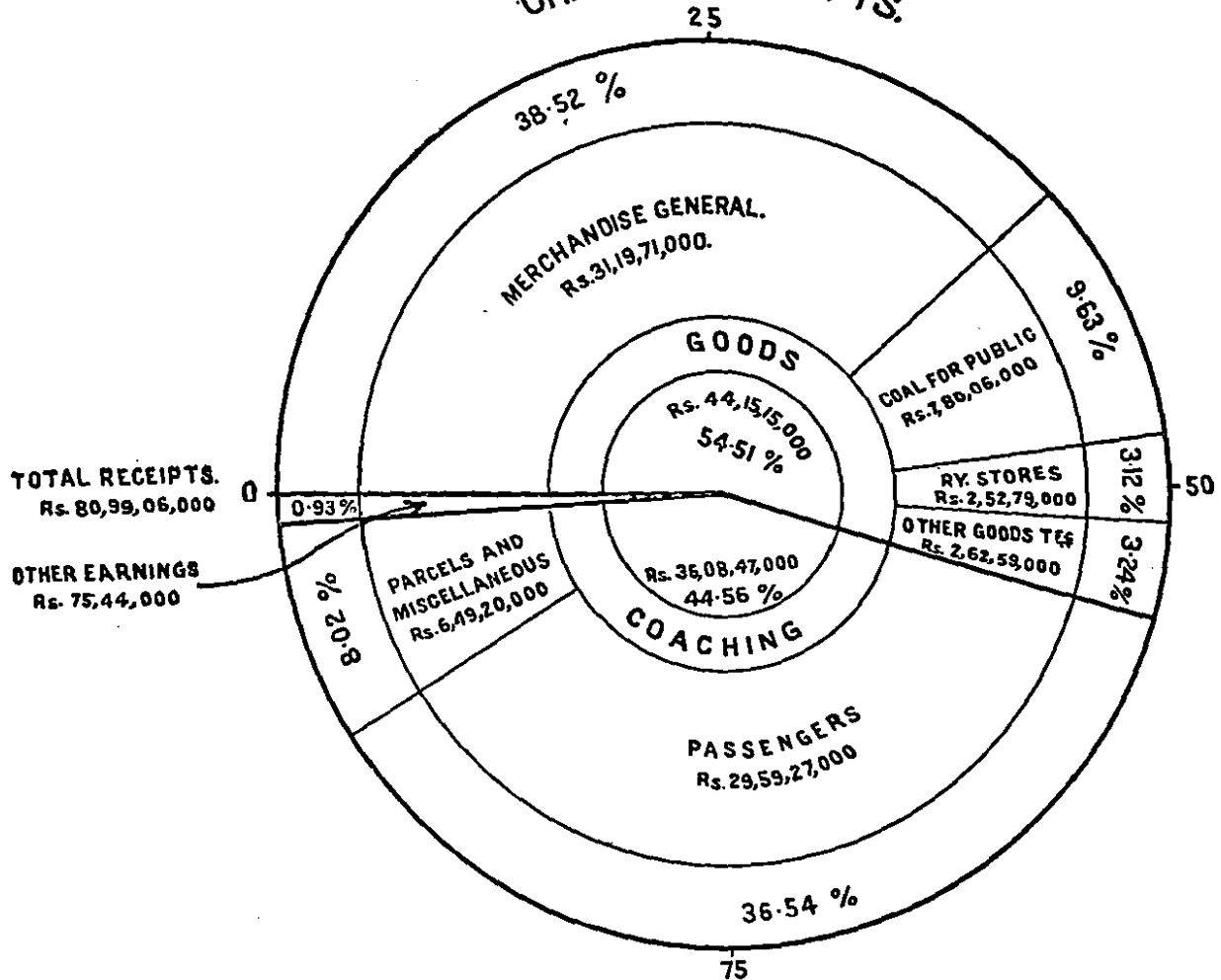
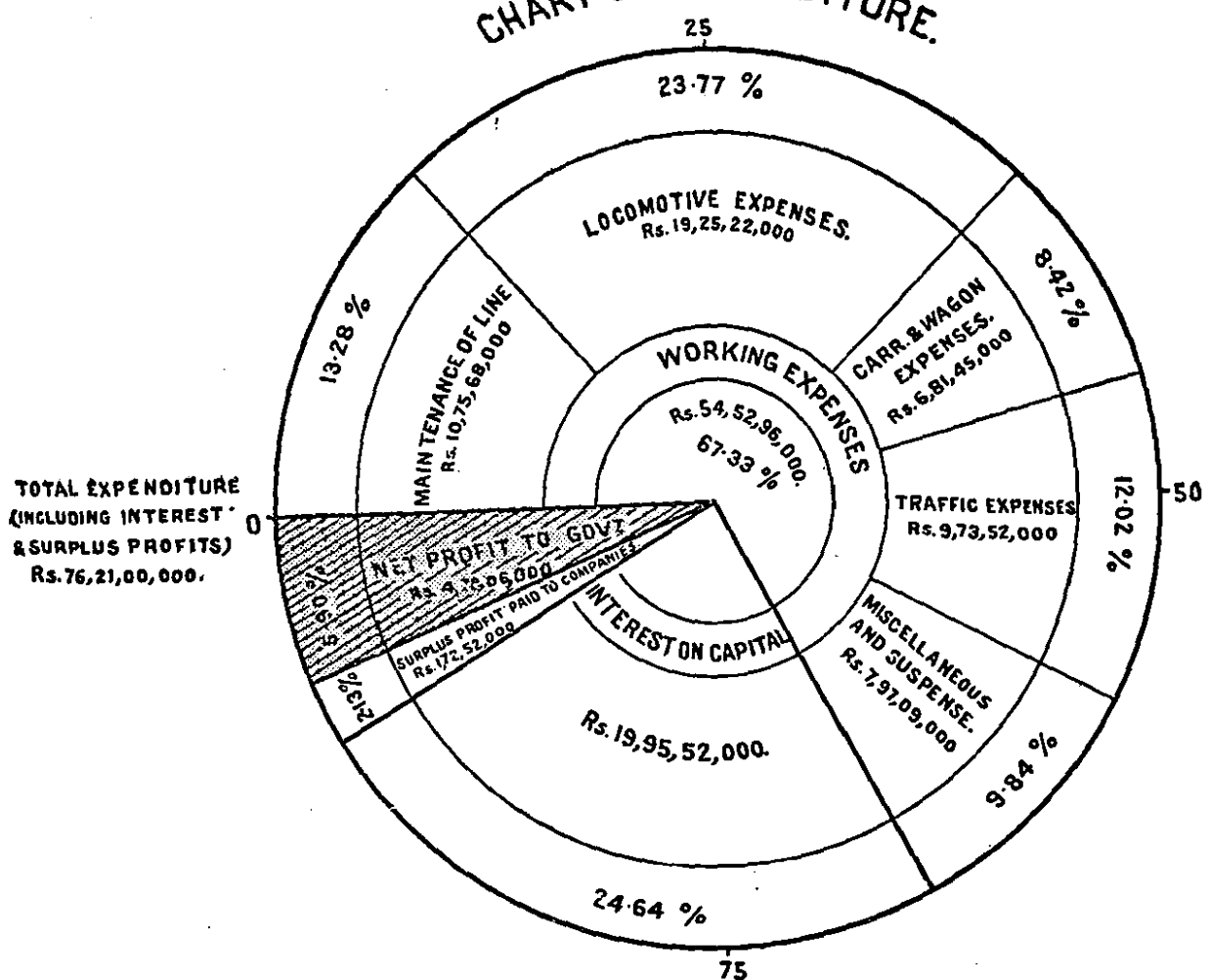


CHART OF EXPENDITURE.



CHAPTER VIII.

ACCIDENTS.

(See Appendices 26, 27 and 28 of Volume II.)

It is satisfactory to report that the total number of persons who lost their lives as a result of accidents during the year showed a decrease, being 3,016 against 3,171 in the previous year. In addition, the number of persons injured was 3,039 in 1920-21 against 3,108 in 1919-20.

**Total
fatalities
and injuries.**

Investigation showed that most of the fatalities which occurred during the year were due to the rash or negligent action of the persons killed, only 209 out of 3,016 having lost their lives as a result of circumstances beyond their control. Of these 37 were railway servants.

Of those who were killed in accidents due to their own action more than half, *viz.*, 1,557 were trespassers in railway property and 230 lost their lives by falling or jumping from trains in motion.

Of the total number of persons (3,039) injured, 1,410 were passengers, 987 railway servants and 526 trespassers. Of the passengers only 275 were injured as a result of accidents to trains and the others by jumping from moving trains or other action due to their own fault.

2. The total number of serious accidents to trains during the year 1920-21 was 469 against 550 in the previous year. A brief account of the more serious accidents is given below.

**Serious
Accidents.**

- (a) On the early morning of the 26th April 1920 at 2/6 hours, a passenger express train ran into the rear of a goods train, outside the outer signal of the Mewa Nawada Station, owing to the line clear having been given to the passenger train when the goods train was actually standing at the outer signal and had not cleared the block section.

**Oudh and
Rohilkhand
Railway.**

The vehicles of the passenger train were lighted by gas, and as a result of the collision the gas tanks burst, the escaping gas ignited and set fire to the wreckage.

One van and three bogie coaches were burnt and the actual casualty list consequently remains in some doubt. It is, however, known that 45 were killed and 69 injured, four of whom subsequently died.

The damage to permanent-way and rolling-stock was estimated at Rs. 98,500.

Serious accidents
(contd).

This serious accident was caused by contravention of certain general rules by the station staff on duty at the time of the accident at Mewa Nawada and Khanth Stations, and also to the contravention of certain general rules by the guard and driver of the goods train. Three of the railway servants considered most culpable were prosecuted; two were acquitted, and one sentenced to a term of rigorous imprisonment. Other railway servants whose conduct was considered to have contributed to the accident have been punished departmentally.

After this accident Railway Board issued orders for all companies to light by electricity.

Bombay, Baroda and Central India Railway.

- (b) On the 17th May 1920, a passenger train was received in the dead end siding at Jakhwada Station on the broad gauge section of the Bombay, Baroda and Central India Railway instead of in the loop (the main line being kept clear to receive No. 1 Down Guzerat Mail which was due to cross 8 Up there) and collided with an empty wagon causing derailment of the train engine, 2 bogie third class coaches and a bogie third class coach with mail compartment. All these vehicles as a result of the collision telescoped killing 26 passengers and injuring 41.

The damage to the permanent-way and rolling-stock amounted to Rs. 23,500.

The accident was due to the incorrect setting of the points. The staff at fault were prosecuted, the pointsman being sentenced to one year's imprisonment, and the others fined.

Bengal-Nagpur Railway

- (c) In the early morning of 8th September 1920, a mail train was derailed between Barabamboo and Amda Stations.

The cause of the accident was a sag in the permanent-way, the foundations of which had been weakened by heavy and continuous rain. The driver of the mail train disregarded the speed restriction imposed by a caution order for the section of line on which the accident occurred, thereby contributing to the serious damage and loss of life. Four passengers were killed and seven injured. Total damages to the permanent-way and rolling-stock amounted to Rs. 54,257.

The driver at fault was prosecuted and punished.

Madras and Southern Mahratta Railway.

- (d) On the night of the 7th October 1920, while the Madras-Bangalore Mail train was running between Arkonam and Musmal Stations on the South West line, the engine suddenly left the rails, and ran down the embankment and turned over on to its side; the bogie carriage next to it crashed into the tender and was tilted over on its side; the second and third vehicles from the engine were also telescoped. The other vehicles remained on the rails undamaged.

Thirteen people were killed and 22 injured. The damage to the rolling-stock and permanent-way amounted to approximately Rs. 68,000. **Serious accidents (contd.)**

The accident is said to have been due to the removal of a rail, and is believed to be the one successful outrage of a series perpetrated by a gang of organised train wreckers.

(e) On the early morning of August 28th, 1920, two goods trains collided between Usargaon and Kalpi on the Cawnpore Branch of the Great Indian Peninsula Railway, due to the Assistant Station Master, Usargaon, having issued a line clear for one train permitting it to proceed into the section occupied by another train. **Great Indian Peninsula Railway.**

None of the staff were killed or seriously injured, but the damage to the rolling-stock and permanent-way amounted to Rs. 23,000 (approximately).

The Assistant Station Master was prosecuted and acquitted, but both he and the drivers whose inattention contributed to the seriousness of the accident have been punished departmentally.

(f) On the morning of the 14th December 1920 at Bommide Station, on the broad gauge, when a goods train was being moved from the platform line to the second line to allow the Mettupalaiyam Mail to run through the station, the latter ran into the goods train. Seven vehicles including one brake-van of the goods train were damaged, the engine and tender of the mail was capsized and partially buried under the wrecked wagons of the goods train. The first two coaches of the mail were capsized and were badly damaged, the third coach which was forced into the ashpan of the capsized engine caught fire and was burnt and the fourth coach was derailed. **South Indian Railway.**

Forty dead bodies, nine of which had been burnt beyond recognition, were removed from the wreckage and 41 injured 3 of whom died on the way to the hospital and 4 after admission.

This serious accident was due to the driver of the mail train running against signals and to the failure of the station staff to observe the rules for shunting.

The staff at fault were prosecuted just before the close of the year under review.

CHAPTER IX.

STORES.

(See Appendix 22 of Volume II.)

Extent of Purchases.

The question of the purchase of materials for railways is one in regard to which a good deal of public interest has in recent years been displayed. Railways taken collectively are probably the largest purchasers of materials in India. The aggregate sum spent in the year under review for this purpose reached the enormous total of Rs. 30½ crores and even this figure excludes materials usually purchased in India such as coal and coke, stone, bricks, lime, ballast, etc. It has been represented and with good reasons that it would be for the benefit both of railways and Indian industries if a larger proportion of this money could be spent in India, and considered from this point of view a little explanation in regard to methods followed and an analysis of the transactions will perhaps serve to dispel a good deal of the misunderstanding which exists in regard to the policy adopted in this matter.

Sources of Supply.

2. The supplies required by railways are divided into—

- (a) Stores of indigenous origin which are purchased in the country;
- (b) Imported Stores procurable in India;
- (c) Stores procured direct from abroad.

Indigenous Stores.

3. Purchases of indigenous stores are arranged for by each railway administration except that in the case of large items such as sleepers, coal and rails the Railway Board negotiates the purchases for the three State-worked lines together. As a matter of principle everything procurable in the country is utilised in preference to articles of foreign manufacture, but it must be borne in mind that quality and source capable of consistent and regular supply are essential. The Stores Purchase Committee which considered this matter in 1920 made various proposals for extending and facilitating such purchases some of which have been adopted and others are under consideration. The question of extension of this form of supply is dependent to a great extent on organisation of Indian industries so as to facilitate matters from this point of view of the prospective purchaser. The main principle is clearly established and everything is being done to make it effective in practice.

Imported Stores.

4. Purchase of imported stores is made either from stocks held by local importing agents or direct by indent from home. In the case of the former category it has hitherto been the rule to restrict purchases to material already in the country, but a relaxation of this rule has been recommended by the Stores Purchase Committee. Purchases from abroad are made for the three State-worked lines by the Director General of Stores and for Company-worked lines by the Boards of the respective companies.

5. Turning now to the actual figures the purchases under the 3 heads referred to above, figures before 1915-16 are not available, but in the last 6 years are as follows:—

					TOTAL VALUE OF STORES PURCHASED BY THE PRINCIPAL RAILWAYS.			TOTAL.
					Value of stores imported direct.	Value of imported stores purchased in India.	Value of stores of Indian manufacture or of indigenous origin.	
					Rs.	Rs.	Rs.	Rs.
1915-16	...	...	...	...	4,26,53,000	1,05,78,000	1,41,88,000	6,74,19,000
1916-17	...	...	...	...	2,09,99,000	2,24,19,000	2,20,42,000	6,54,60,000
1917-18	...	...	...	...	1,34,83,000	2,74,13,000	2,30,02,000	6,38,98,000
1918-19	...	...	...	...	2,48,49,000	3,18,38,000	7,05,98,000	12,72,85,000
1919-20	...	...	...	...	11,47,63,000	3,91,89,000	8,30,26,000	23,69,78,000
1920-21	...	...	...	...	16,23,41,000	5,01,11,000	9,01,07,000	30,25,59,000

It will be noticed that the total figure has grown from Rs. 6,74,19,000 in 1915-16 to Rs. 30,25,59,000 in 1920-21. The value of stores imported direct fell off during the worst of the war years to Rs. 1,34,83,000 and has now increased to the large figure of Rs. 16,23,41,000 or to nearly four times the figure of 1915-16. In the same period imported stores purchased in India have increased to about five times and local purchases over six times their value, and judged simply from a superficial survey of the figures it may appear that the principle of increasing local purchases at expense of imported material is hardly effective in practice. To get at the facts of the position it is necessary to make a further analysis. The figures given exclude in the first place coal, stone, bricks, lime and other materials invariably purchased in India which are often charged direct to works in which used. To this extent, therefore, the total value of Indian purchases is understated.

6. The large figure of imported materials includes the following—

- (1) Bridge work.
- (2) Engineers plant and workshop machinery and tools.
- (3) Rolling stock.
- (4) Electrical plant.
- (5) Permanent-way.
- (6) Metals.
- (7) Miscellaneous.

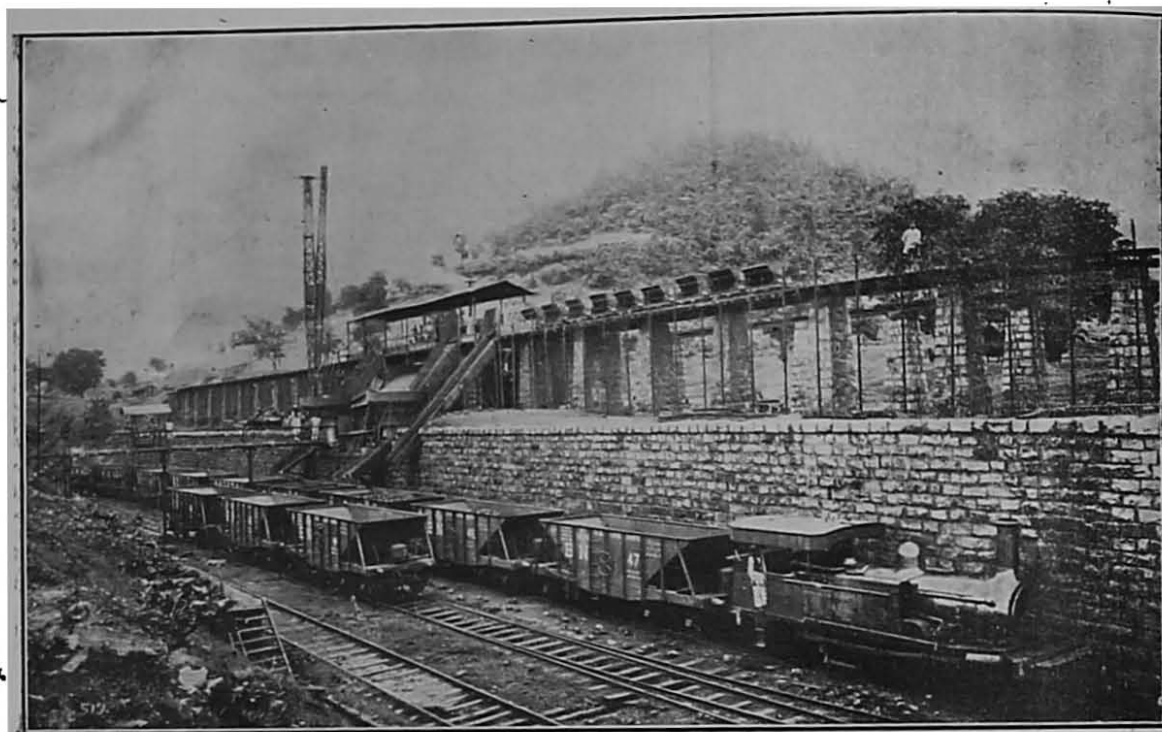
Analysis of stores purchased.

Of these the first four are practically unobtainable in India. Bridge work, wagons and carriage underframes are to a small but increasing extent turned out in Indian shops, but they are still dependent on supplies from abroad for many essentials.

Locomotives, tools and electric plant are not procurable at all. It is these costly items for which there is no alternative market which make up the greater part of the foreign purchases.

In regard to some of the other items an immense improvement in respect of Indian purchase is apparent.

The purchase of rails in India has risen from Rs. 13·91 lakhs in 1915-16 to Rs. 62·46 lakhs in 1920-21. Iron and steel were purchased in India to the extent of Rs. 59·20 lakhs in 1920-21 against Rs. 12·87 lakhs in 1915-16 as a direct result of the enterprise of Messrs. Tata and Sons.



Wagons being loaded with iron ore at Gurumahsini Mines owned by Messrs. Tata and Sons.

It is sincerely to be hoped both in interests of India generally and Indian Railway managements in particular that further industries on similar lines in respect of other requirements may be started in the country and that within the next few years India will be able to make some appreciable progress towards making herself self-supporting in respect of material for her railways.

CHAPTER X.

CONCLUSION.

The previous chapters of this report have dealt entirely with the plain **Technical** every day facts and problems of working railways in India. But there is a technical and scientific side to this matter which can not afford to be neglected. This is provided for by the technical section of the Railway Board's office which is designed to initiate research in respect of technical engineering matters affecting railways and to serve as a medium for communicating results attained for the general benefit.

2. One of the principal matters engaging attention during the year under review has been the question of bridges. In order to deal satisfactorily with this important subject a special Bridge Committee has been formed from the engineers of all railways which is presided over by the Chief Engineer to the Railway Board. The principal matter which has so far engaged their attention has been the evolution of a satisfactory formula for "Impact." Without entering into any technical details it may be explained that this subject has a very important bearing on the necessary factor of safety. Considerable progress has been made as a result of their deliberations and from the actual tests of bridges made by a special officer deputed for this purpose with Fereday Extensometers and other approved instruments. An officer was sent in this connection to England and America to compare and co-ordinate the work of the Committee with that done in America and elsewhere. His Report was in the press at the close of the year. While on leave in England the Board's Chief Engineer got in touch with the British Engineering Standards Association and with officers of Ministry of Transport and Railway Engineers' Association who are carrying out parallel investigations. It is hoped that the final result of these measures will be of great technical interest and value in future railway construction in India.

3. Apart from this the technical section of the Railway Board's office have published the following papers during the year:—

- No. 201.—Locomotive Design in relation to gradients and curves.
- No. 202.—Locomotive Design as it affects the Bridge Engineer.
- No. 203.—Cast Iron Sleepers.
- No. 204.—Possibilities of Steam Railway Electrification.
- No. 205.—Renewal of Girders on the Kiul Bridge, East Indian Railway.
- No. 206.—Train Resistances.
- No. 207.—New Hump Marshalling Yard at Feltham, London and South Western Railway.



- No. 208.—Notes on Railway Surveys.
- No. 209.—Control of Railway Traffic by Telephone.
- No. 210.—Motor Traction and Road Railway (Stronach-Dutton system).
- No. 211.—Third Report of the Indian Railway Bridge Committee.
- No. 212.—Some Aspects of the Gauge Question.
- No. 214.—Motorizing Railway Terminals.
- No. 215.—Hardinge Bridge over the Ganges at Sara.
- No. 216.—Stability of Hill Slopes.
- No. 218.—Wheel Dimensions and crossing clearances.

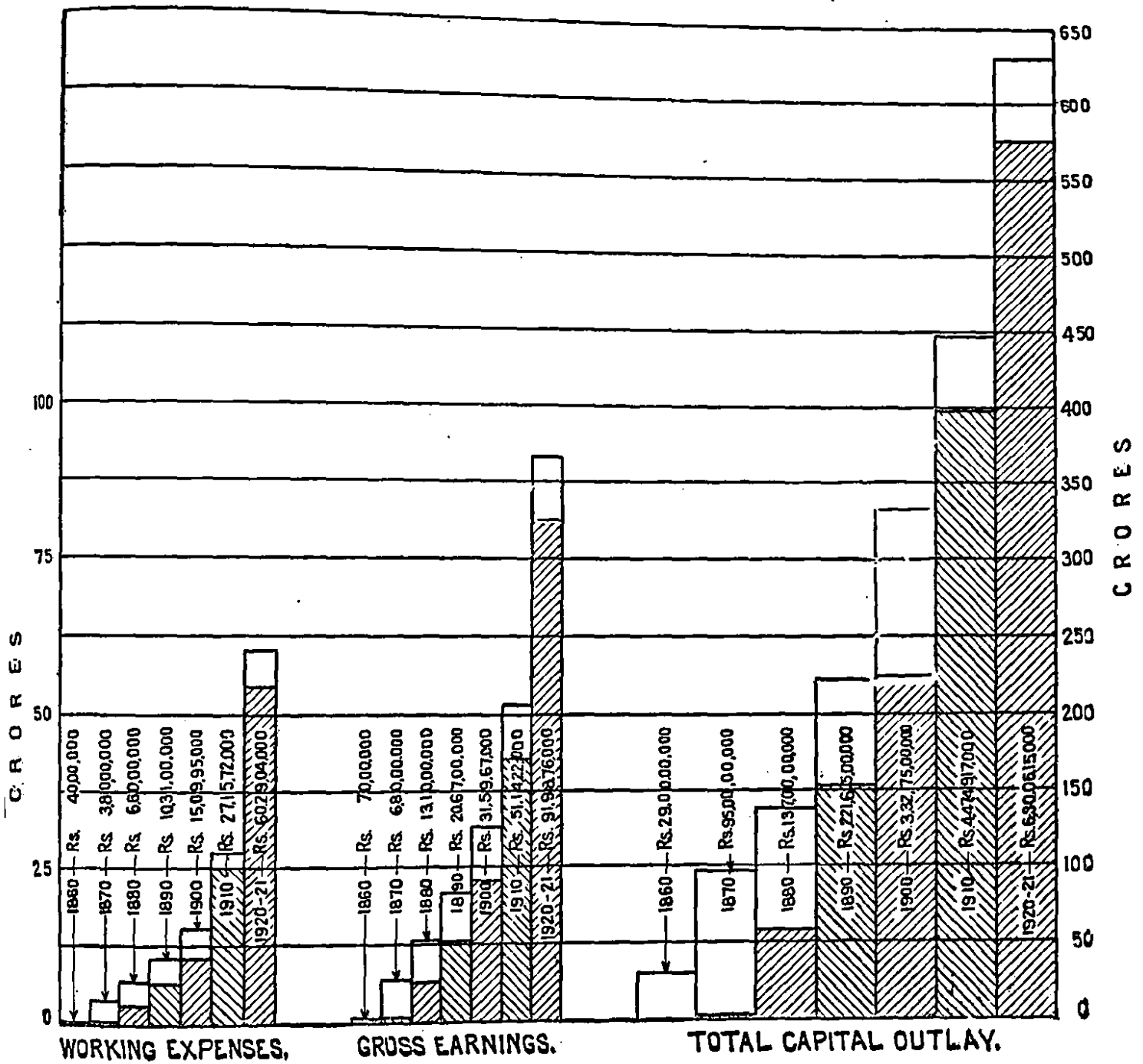
Several other papers were in the press at the close of the year. A complete list of technical papers issued up-to-date can be obtained *gratis* from the Chief Engineer with the Railway Board, Simla.

Conclusion.

4. In concluding this report reference must be made to the valuable Report on Indian Railways, which has been received from the Committee presided over by Sir William Acworth which concluded its labours after the year under review had closed. This report is now in the hands of the public and it is hoped that some of the facts brought out in the preceding pages will help them to appreciate and weigh the arguments for a change in the existing methods of finance and administration which the Committee have advocated. India is on the eve of great changes, economic as well as political. Important schemes of manufacture and mining and other developments are being initiated, the progress of which depends in almost every case on adequate transportation facilities. It is therefore in the first degree important that any change which is now made shall be wisely conceived and carefully considered before it is adopted so that we may effect a real and lasting improvement in the management of our railways on which the prosperity of the country so greatly depends.

RAILWAY DEVELOPMENT IN INDIA.

State Lines..... 
Other Lines..... 



SERVANTS OF INDIA SOCIETY'S
 BRANCH LIBRARY
 BOMBAY

Appendix A.

Notes on the Relation of the Government to Railways in India.

(Reprinted from the Report for 1914-15.)

One of the special features of the Indian Railway system is the diversity of conditions that prevails in the relation of the State to the various lines in respect of ownership and control. **Diversity of Relations Between the State and Railways.** Of the important lines situated in British India or in which the Government of India is interested, three (the North Western, Eastern Bengal and Oudh and Rohilkhand Railways) are owned and worked by the State; eight (the East Indian, Great Indian Peninsula, Bombay, Baroda and Central India, Madras and Southern Mahratta, Assam-Bengal, Bengal-Nagpur, South Indian and Burma) are owned by the State but worked on its behalf by companies enjoying a guarantee of interest from the Government; three important lines (the Bengal and North-Western, Rohilkund and Kumaon and Southern Punjab) and many of less importance are the property of private companies, some being worked by the owning companies and some by the State or by the companies that work State-owned systems; several minor lines are the property of District Boards or enjoy a guarantee of interest granted by such Boards.

The diversity of conditions is in certain respects less important than might at first appear for the following reasons:—

The Government of India exercises under the Indian Railways Act, 1890, in respect of all railways in British India (and also, by virtue of arrangements with Indian States, in respect of the chief railways passing through such States), certain general powers. Thus a railway may not be opened until a Government Inspector has certified that it has been constructed so as to comply with requirements laid down by the Government and can be used for the public carriage of passengers without danger to them. The Government of India can also, in the interest of the safety of passengers, require a railway to be closed, or the use of particular rolling-stock to be discontinued, or may prescribe conditions for the use of the railway or the rolling-stock. They can appoint a Railway Commission to investigate complaints on certain matters such as the withholding of reasonable traffic facilities or the grant of undue preference.

In addition, the Government of India (or in some cases Local Governments) exercise under the provisions of contracts detailed control over the management of all Railways in British India greatly exceeding that which is secured by the Indian Railways Act. They also have a certain financial interest in all companies in British India, and a preponderating interest in most of the railways which are of the first importance.

The main causes which have led to the present diversity of conditions in regard to the agency by which railways are managed, and the relations of the Government with the various classes of companies now in existence, are summarised

History of Relations of the Government and Companies. in the following paragraphs:—

The first proposals for the construction of railways in India were submitted in 1844 to the East India Company in England by Mr. R. M. Stephenson, afterwards Chief Engineer of the East Indian Railway, and others; they included the construction of lines by railway companies to be incorporated for the purpose and the guarantee by the East India Company of a specified return. A contract for the construction by the East Indian Railway Company of

an experimental line of 100 miles from Calcutta towards Mirzapore or Rajmehal at an estimated cost of 1,000,000*l.* was made in 1849, and a return of 5 per cent. was guaranteed by the East India Company on the Capital; and a similar contract was made in the same year with the Great Indian Peninsula Railway Company for a line from Bombay to Kalyan at an estimated cost of 500,000*l.* But the policy of entrusting generally the construction of Indian railways to guaranteed companies was not adopted until 1854 on the recommendation of Lord Dalhousie, who, in a minute, dated 20th April 1853, explained his reasons for preferring the agency of companies, under the supervision and control of the Government, to the construction of lines on behalf of the Government by its own officers. He held that the State Engineer officers would make railways as well, and possibly as cheaply, and as expeditiously as companies; but that the withdrawal from other duties of the large number of officers required would be detrimental to the public interest, that the conduct of commercial undertakings did not fall within the proper functions of any Government and least of all within the functions of the Government of India, since the dependence of the population on the Government was, in India, one of the greatest drawbacks to the advance of the country, and that the country would therefore benefit by the introduction of English energy and English capital for railway purposes, with the possibility that such energy and capital would in due course be encouraged to assist in the development of India in other directions.

The policy supported by Lord Dalhousie was adopted, and between 1854 and 1860

Old Guaranteed Railways. contracts for the construction of Railways in India were made by the East India Company, or (after 1858) by the Secretary of State for India with the East Indian, Great Indian Peninsula, Madras, Bombay, Baroda and Central India, Scinde (afterwards the Scinde, Punjab and Delhi), Eastern Bengal, Great Southern of India (afterwards, when amalgamated with the Carnatic Railway Company—see below—the South Indian) and Calcutta and South-Eastern Railway Companies. Under these contracts the railway companies undertook to construct and manage specified lines, while the East India Company (or the Secretary of State for India) agreed to provide land and guaranteed interest on the capital, the rate fixed being in various cases 5, 4½ and 4¼ per cent. according to the market rates prevailing when the various contracts were made. Half of any surplus profits earned was to be used towards repaying to the Government any sums by which it had been called upon to supplement the net earnings of any previous period in order to make good the guarantee of interest; and the remainder was to belong to the shareholders. In practically all matters of importance, except the choice of staff, the companies were placed by the contracts under the supervision and control of the Government, which had power to decide on the standard and details of construction; the rolling-stock to be provided, the number, time and speed of trains; the rates and fares to be charged; the expenditure to be incurred; the standard of maintenance; and the form of accounts. The railways were to be held by the companies on leases terminating at the end of 99 years, and on such termination the fair value of their rolling-stock, plant and machinery was to be paid to them. But provision was also made to enable the Government to purchase the lines after 25 or 50 years on terms calculated to be the equivalent of the companies' interests therein and also to enable the companies to surrender their lines to the Government and to receive in return their capital at par.

An attempt to secure the construction of railways in India, on terms more favourable to the Government than those of the contracts with the original guaranteed companies, was first made in 1862, when a subsidy, but not a guarantee, was granted to the Indian Branch Railway Company which proposed to make feeders to the trunk lines in Northern India, and did actually make one such line. Similar assistance was granted later to the Indian Tramway Company,

Early Attempts to Secure Funds for Railway Construction without a Guarantee.

which made a short line in Madras. In 1864, the terms granted to the two companies mentioned were taken as a standard for general adoption with a view to the encouragement of similar companies. The chief provisions were that the Government, besides giving the necessary land free of costs, would grant an annual subsidy for 20 years at a rate not exceeding £100 per mile of line, with an addition in respect of large bridges costing more than £10,000. These terms failed to attract capital, and the two unguaranteed companies which had begun work found themselves after a few years unable to proceed without further assistance from the Government. Consequently, in 1867, a contract was entered into with the Indian Branch Railway Company (which soon after changed its name to the "Oudh and Rohilkhand Railway Company") by which the company was guaranteed interest at 5 per cent. per annum on the cost of certain lines to be carried out by it, on conditions similar to those laid down in the contracts of the period 1854—1860. Similarly, the Indian Tramway Company, after having been given in 1868 a guarantee of 3 per cent. per annum, went into liquidation in 1870, and became absorbed in a new company called the Carnatic Railway Company (afterwards amalgamated with the Great Southern of India Railway Company to form the South Indian Railway Company), with which the Secretary of State entered into a contract guaranteeing interest on its capital at 5 per cent. per annum. In 1869, Sir John Lawrence summed up the result of the experiment of the construction of railways by unguaranteed companies as follows:—"The Government of India has for several years been striving to induce capitalists to undertake the construction of railways in India at their own risk, and on their responsibility with a minimum of Government interference. But the attempt has entirely failed, and it has become obvious that no capital can be obtained for such undertakings otherwise than under a guarantee of interest fully equal to that which the Government would have to pay if it borrowed directly on its own account."

The attempt to encourage unguaranteed companies having thus been unsuccessful, it became necessary to decide whether the old practice of relying on guaranteed companies, of the type that had provided capital for, and had constructed, the first railways in India, should be continued. The Government of India expressed their objections to this course. They doubted whether their power of control over such companies secured the greatest possible economy in construction. They also disliked the arrangements under which they guaranteed the interest on the capital of companies, and thus became responsible for loss on working while having only a comparatively remote prospect of profiting by the result of successful working. Two important changes were consequently made in the practice that had been followed since the beginning of railway construction in India:—

1. Arrangements were made with some of the most important of the guaranteed companies that, in lieu of the provision that half of any surplus profits was to be applied in repayment of sums advanced by the Government under the guarantee of interest, half of the surplus profits for each half-year should be the property of the Government. In consideration of this modification, the Government relinquished, in the case of three companies, the Great Indian Peninsula, the Bombay, Baroda and Central India, and the Madras, its right to purchase the lines at the end of the first 25 years from the dates of the respective contracts.
2. It was decided by the Secretary of State that the time had arrived when in both raising and expending such additional capital as might be required for new lines in India, the Government should secure to itself the full benefit of its own credit and of the cheaper methods which it was expected that it would be able to use. Accordingly, for several years after 1869, the chief capital expenditure on railways was chiefly incurred direct by the State and no fresh contracts with guaranteed companies were made except for small extensions. Among the

lines constructed or begun by State agency and from State capital between 1869 and 1880 were the Indus Valley, Punjab Northern, Rajputana-Malwa, Northern Bengal, Rangoon and Irrawaddy Valley, and Tirhoot.

By the end of 1879, in about 25 years from the introduction of railways in India, 6,128 miles of railway had been constructed by companies which had expended, approximately, £97,872,000 (these figures include the Calcutta and South-

Progress in the Construction of Railways. Eastern and Nalhati Railways, which were constructed by companies but were purchased by the Government in 1868 and 1872, respectively). By the same date 2,175 miles of railway had been constructed by the Government at a cost of £23,695,226.

In 1880, the necessity for great and rapid extension of the railway system was urged by the Famine Commissioners, appointed after the great famine of 1878, who estimated that at least 5,000 miles were still necessary for the protection of the country from famine. It was held by the Government of the time that a limit was necessary on the capital borrowed annually; and it was clear that the limit fixed was not high enough to allow of such progress in railway construction as was desirable. With reference to this difficulty the Famine Commissioners remarked: "that there would be mani-

Introduction of Modified Guarantee Terms.

fest advantages in giving free scope to the extension of railways by private enterprise if it were possible; and, though the original form of guarantee has been condemned, it may not be impossible to find some substitute which shall be free from its defects, and may secure the investment of capital in these undertakings without involving the Government in financial or other liabilities of an objectionable nature."

Action in the direction suggested by the Commission was taken by the formation of three companies without a guarantee (the Bengal Central in 1881 and the Bengal and North-Western and Rohilkund and Kumaon in 1882) and three new guaranteed companies (Southern Mahratta in 1882, the Indian Midland in 1885, and the Bengal-Nagpur in 1887). The Bengal and North-Western and the Rohilkund and Kumaon Railway Companies are referred to more fully in a later paragraph. The Bengal Central Railway Company's operations were not successful at the outset, and a revised contract was entered into with the company, with effect from the 1st July 1885, under which the Secretary of State guaranteed interest at 3½ per cent. on the company's capital, the balance of net earnings remaining after payment of interest on advances by the Secretary of State and debenture capital (but not the share capital) being divided between the Secretary of State and the company in the proportions of three-quarters to the former and one-quarter to the latter. The new contract gave the Secretary of State the right to take possession of the line on the 30th June 1905, or subsequently at intervals of 10 years, on repaying the company's capital at par. The rate of interest guaranteed to the Southern Mahratta Railway Company was also 3½ per cent.; in this case the balance of net earnings remaining after payment of interest on advances by the Secretary of State (but not on share or debenture capital) was divisible in the same way as in the case of the Bengal Central Railway Company. The guarantee to the Indian Midland and Bengal-Nagpur Railway Companies was 4 per cent.; and the Secretary of State was entitled to three-quarters of the surplus profits in excess of all interest charges. The lines constructed by the three companies last mentioned were declared to be the property of the Secretary of State, who had the right to determine the contracts at the end of approximately 25 years after their respective dates, or at subsequent intervals of 10 years, on repaying at par the capital provided by the companies.

The Assam-Bengal Railway Company was formed on similar lines in 1892, except that any surplus profits were to be divided between the Secretary of State and the company in

proportion to the capital provided by each. The rate of guarantee in this case was $3\frac{1}{2}$ per cent. for the first six years and thereafter 3 per cent. The Burma Railways Company was formed in 1897 to manage and develop the line in that Province that had been constructed by the State. Interest at $2\frac{1}{2}$ per cent. was guaranteed on the share capital raised by the company, and the surplus profits were originally divisible in the proportion of four-fifths to the Secretary of State and one-fifth to the company, but since 1908 the division has been proportional to the capital invested by each in the undertaking. The contract with the Burma Company is terminable by the Secretary of State in 1928, or on subsequent occasions, on repayment of the company's capital at par.

The terms of guarantee given to the companies formed since 1880 have thus been much more favourable to the Government than in the case of those formed before 1869.

In dealing with the guaranteed companies formed before 1869 and with those formed in 1881 and subsequently, it has been the practice (except in the cases mentioned above, when the purchase of some of the old guaranteed lines was

Termination of Contracts of the Old Guaranteed Companies. postponed in order to secure to the Government a share in surplus profits) to use in some way or other at the earliest possible date the right reserved by the Government of terminating the contracts of the various companies. The method of making use of this right has differed in different cases. The Eastern Bengal, Oudh and Rohilkhand, and Scinde-Punjab and Delhi lines were purchased and transferred to State management, the last named now forming part of the North Western Railway. Similarly, the Bengal Central line was purchased and made part of the Eastern Bengal Railway. The Madras and the Indian Midland lines were acquired but left, after acquisition, under the management of companies working other lines with which it was advantageous to amalgamate them. In all other cases (East Indian, South Indian, Great Indian Peninsula, Bombay, Baroda and Central India, Southern Mahratta, and Bengal-Nagpur), the course adopted has been to arrange for the continuance of management by the original company (or by a new company closely related to the old one), but to secure more favourable financial conditions for the State by one or more of the following methods:— reduction of the amount of capital retained by the companies in the undertakings, reduction of the rate of interest guaranteed by the State on such capital, and modification in favour of the Government of the clauses relating to the division of surplus profits.

Arrangements between the Government and Companies at present.

The relations between the Government and the guaranteed companies now working railways may be summarised as follows:—

The lines that they work are the property of the State.

The greater part of the capital is the property of the Government, either through having been originally supplied by it or through the acquisition by the Government of the greater part of the companies' interests on the termination of old contracts.

When funds are required for further capital expenditure, the Government has the option either of providing them or of calling on the company to provide them. The company receives guaranteed interest at a fixed rate on its capital; and similar payments out of the earnings are made to the Government. If, after these have been made, surplus profits remain, they are divided between the Government and the company in the various proportions provided for by the contracts. The company's share is in all cases only a small fraction of the Government's share.

All the contracts, except one, which is for a fixed term of 25 years, are terminable at the option of the Secretary of State, at specified dates; and on termination the-

company's capital is repayable at par (except in the case of the East Indian Railway Company, which is for special reasons to receive a terminable annuity instead of a cash payment).

The administrative control exercised by the Government over the companies is as follows:—

The company is bound to keep the line in good repair, in good working condition, and fully supplied with rolling-stock, plant, and machinery; to keep the rolling-stock in good repair and in good working condition; and to maintain a sufficient staff for the purposes of the line;—all to the satisfaction of the Secretary of State.

The Secretary of State may require the company to carry out any alteration or improvement in the line, or in the working that he may think necessary for the safety of the public or for the effectual working of the line.

The Secretary of State may require the company to enter into agreements, on reasonable terms and conditions, with the administrations of adjoining railways for the exercise of running powers, for the supply to one another of surplus rolling-stock, for the interchange of traffic and rolling-stock and the settlement of through rates, and for additions and alterations to, or the redistribution of, existing accommodation in junctions or other stations in view to their convenient mutual use.

The train service is to be such as the Secretary of State may require. In order to secure a general control over the rates quoted by companies, the Secretary of State has retained power to settle the classification of goods and to authorise maximum and minimum rates within which the companies shall be entitled to charge the public for the conveyance of passengers and goods of each class.

The company has to keep such accounts as the Secretary of State may require, and these are subject to audit by the Secretary of State.

In all other matters relating to the line the company is made subject to the supervision and control of the Secretary of State, who may appoint such persons as he may think proper for the purpose of inspecting the line, auditing the accounts, or otherwise exercising the power of supervision and control reserved to him. In particular, the Secretary of State has the right to appoint a Government Director to the Board of the company, with a power of veto on all proceedings of the Board. All the moneys received by the company in respect of the undertaking, whether on capital or revenue account, have to be paid over to the Secretary of State.

All expenditure by the company has to be stated and submitted for the sanction of the Secretary of State,

Thus, the Government has the preponderating financial interest in the lines worked by the two classes of guaranteed companies, those formed before 1869 and retained as working agencies with reduced capital after purchase, and those formed on terms more favourable to the State after 1880; it has exceedingly wide control over the methods of working; and it has the right of taking possession of the lines at specified times on repayment at par of the capital of the companies.

In addition to the lines referred to above, and apart from lines constructed by branch line companies, District Boards and Indian States, two lines of some importance have been **Other Lines Worked by Companies.** constructed by companies which receive no direct assistance by the Government, namely, the Bengal and North-Western Railway and the Rohilkund and Kumaon Railway. (The Rohilkund and Kumaon Railway Company was guaranteed interest at 4 per cent. during construction and received for 10 years thereafter a subsidy of Rs. 20,000 per annum. This ceased in 1894.) While, however, these companies have no guarantee or other direct payment from the Government, they derive some advantage (partly through direct participation in profits and partly through reduction of expenses) from the fact that the working of certain State lines has been entrusted to them, the Tirhoot Railway to the former company and the Lucknow-Bareilly Railway to the latter. Their lines can be purchased by the State in 1932 on terms which are different in respect of the different sections of the lines, but are, on the whole, much more favourable to the companies than those provided for in the contracts with the guaranteed companies. Failing purchase in 1932, the lines will become the property of the State in 1981 on terms much less favourable to the companies. The general administrative control exercised by the State over these companies and the control over expenditure are similar to that which is exercised, as explained above, over guaranteed companies.

The greater number of the powers for the detailed control of railways as described in the foregoing paragraphs are vested in the Railway **Controlling Authority.** Board. The Board consists of a President and two Members with a Secretariat establishment.

Appendix B.

*Resolution No. 457-R.P., dated the 14th November 1913, as modified by
letter No. 969-R.P.-14, dated the 13th March 1914.*

Terms on which the Government of India are prepared to consider offers for the construction by the Agency of private companies of branch lines forming feeders either to State lines worked by the State or to railways worked by companies.

RESOLUTION.—In supersession of all previous orders on the subject, the following information is published detailing the conditions on which the Government of India will be prepared to receive applications for the grant of financial assistance to companies formed to provide capital for the construction of such branch railways as Government may be prepared to entrust to companies. The terms offered have been made considerably more liberal in several respects.

2. No concession can be granted for the construction of a branch line until the line has been surveyed and detailed estimates of its cost and an adequate report on its traffic prospects have been prepared by an agency approved by the Government of India. When promoters are desirous that such a survey should be made an application should be submitted to the Railway Board in the form prescribed in memorandum B, attached.

3. The conditions on which concessions for the construction of branch lines will be granted are as follows :—

- (i) The prospectus of the company to be formed for the purpose of providing capital for the line must be submitted to, and approved by, the Government of India before issue. The capital of the company must be expressed in rupees, and subscription must be invited only in India. The amount of capital to be raised will be subject to the approval of the Government of India and the construction of the line will not be begun until the Government of India are satisfied that capital sufficient to meet the estimated expenditure has been subscribed.
- (ii) The railway shall be built according to plans and estimates approved by the Government of India, and must conform to the fixed and moving dimensions for the time being prescribed. The gauge of the line, the route followed, the situation of stations, and details of a similar character shall be subject to the approval of the Government.
- (iii) All land in British Territory, which is, in the opinion of the Government of India, required for the construction of the line, will be provided free of charge, including land permanently or temporarily required for quarrying ballast, for brick-fields, and similar purposes.
- (iv) The results of existing surveys will be made available to persons applying for concession under these rules. In cases where this is considered advisable by the Railway Board, fresh surveys will be made at the request of promoters enquiring into the probable prospects of any projected line, on the understanding that no preferential claim to a concession for the construction of the line is thereby established. If permission be eventually given for the construction of any line the cost of all surveys, whether special surveys or surveys previously made at

the cost of, or with the approval of Government, shall be included in the capital cost of the railway. The Government of India expressly disclaim all responsibility for the accuracy of any survey, plan, estimate, or other information supplied by them.

- (v) Electric telegraphs and telegraphic appliances will be supplied and maintained by the Government of India at the charges and on the conditions in force for the time being for similar services on State railways.
- (vi) Railway materials for the construction of the branch line will be carried over railways owned and worked by the State at the special rates charged for similar materials belonging to State railways.
- (vii) The Government of India will grant financial assistance to approved companies either in the shape of a guarantee of interest, or of a rebate to the branch line company from the net earnings of the main line from traffic interchanged with the branch. Assistance in the latter form can only be promised where the main line is worked by the State; but the Government of India will, in other cases, endeavour to arrange on behalf of the branch line company a similar agreement with the company working the parent line. "A rebate and a guarantee of interest cannot be granted simultaneously in respect of the same capital; but capital may be raised for the same branch line, partly under the guarantee system and partly under the rebate system." In cases where the entire capital is raised by the issue of shares the following terms will apply:—
- (a) *Guarantee of interest.*—The Government of India will be prepared to guarantee from the close of the period during which interest is payable out of capital interest at the rate of $3\frac{1}{2}$ per cent. per annum on the approved paid-up share capital of the company to the end of the financial year in respect of which the dividend is declared, subject to the condition that all surplus profits which may be earned by the company after paying interest on the paid-up share capital at the rate of 5 per cent. shall be equally divided between the Government and the company. This guarantee, where given, will remain in force until the line is purchased by the Government. Any sums payable by the Government under the guarantee shall be payable in rupees.
- (b) *Rebate.*—When the branch line connects with a railway owned and worked by the State, the Government of India will be prepared to allow the company in respect of, and, at the end of each financial year, by way of rebate, such a sum, not exceeding in any year the net earnings (exclusive of earnings derived from the carriage of revenue stores) from traffic interchanged between such State railway and the branch line as shall, together with the net earnings of the branch line, make up an amount equal to interest at the rate of 5 per cent. per annum on the approved paid-up share capital of the company. This undertaking will be subject to the proviso that, when the net earnings of the company, without the assistance of a rebate, suffice to pay interest at a rate exceeding 5 per cent. on the paid-up share capital, the surplus shall be divided equally between the Government and the company. The payment of rebate shall commence at the close of the period during which interest is payable from capital. Payments on account will, subject to subsequent adjustment, be permissible at the end of each half-year. For the purpose of calculating the rebate, the net earnings of the main line from traffic interchanged with the branch, will be assumed to bear the same proportion to the gross earnings

of the main line from such traffic as the net earnings of the whole main line system, including the branch, bear to the gross earnings of the whole system.

(c) *Combination guarantee and rebate terms.*—“When the capital of a branch line has been raised partly on guarantee and partly on rebate terms, the Government of India will allow in respect of this share capital issued on the $\frac{\text{Guarantee}}{\text{Rebate}}$ system the amount (if any) which would have been due on such share capital from time to time had the entire capital been raised on $\frac{\text{Guarantee}}{\text{Rebate}}$ terms.”

(viii) (a) If, in the case of a concession granted under either of the conditions of the foregoing paragraph, it be intended by the branch line company to construct and work the branch line itself, the amount to be spent each year on working expenses will be subject to the approval and sanction of the Government of India.

(b) In such cases the Government of India may, from time to time, appoint any one person to be a Director of the branch line company who 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 other matter connected therewith, and shall have power to exercise at his discretion an absolute veto in all proceedings of the Board of Directors and shall not be removable except by the Government of India, and may act by a Deputy appointed by the Government of India.

(c) If a branch line company, which has been granted financial assistance under clause *vii(a)* above and permitted to work the railway by its own agency, be guilty of any breach of contract or of gross mismanagement, or if the working expenses of the railway exceed the gross earnings for six consecutive half-years, the Government of India may at any time, after giving six months' notice, assume the working of the railway by the State or any other agency. If the working of the line is so assumed, the terms of working will be fixed by Government.

(ix) Where the main line is a railway owned and worked by the State, the main line administration will, if it is so desired, work the branch line for a percentage of the gross earnings of the branch. When the branch and main line are of the same gauge this percentage will usually be that obtaining on the whole system, including the branch, from time to time, but will not in any case exceed 50 per cent of the gross earnings of the branch from all sources, and will include all charges on account of the use of the main line rolling-stocks, subject to the condition that the company shall, if and when required to do so during the continuance of the working contract, bear the capital portion of the cost as stated by Government of strengthening the permanent-way and bridges of the branch line to enable the rolling-stock for the time being of the working railway to be used on it without restriction. Where the gauges are not the same, special working terms will be fixed in each case. When the main line is not worked by State agency, the Government of India, if desired to do so by the branch line company, will endeavour to negotiate similar terms for working with the main line administration.

(x) No capital expenditure by the branch line company shall be recognised, as between the Government of India and the company, unless the prior sanction of the Government of India to that expenditure has been obtained. The

company shall have no power to increase its share or stock capital without the sanction of the Government of India or the Secretary of State, or to borrow money, otherwise than for purely temporary purposes, except on conditions to be specified by these authorities.

- (xi) Any unexpended capital, which the company may have, shall be invested or deposited at interest in a manner to be approved by the Government of India and in the name of the company, not in that of the Managing Agents, and the return therefrom shall be treated as net earnings of the railway.
- (xii) The branch line company, if so required, shall keep accounts in forms approved by the Government of India, and they shall supply, free of charge, all accounts required by the Government. The accounts will be subject to audit by officers appointed by the Government.
- (xiii) Funds for the execution of new works chargeable to capital, which may be found to be necessary for the safety, economy, or efficiency of working after the branch railway has been opened to public traffic, shall be provided by the branch line company. Such works and their cost shall, when the branch railway is worked by the main line administration be agreed upon between the branch line company and the main line administration before they are undertaken; in the event of any difference of opinion as to the necessity for, or the cost of any such work, the matter shall be referred to the Railway Board, whose decision shall be final.

In the event of the branch line company failing to provide, after six months' notice, any additional capital for work required under this condition or conditions (ii) and (iv) above, the Government of India shall be at liberty to supply the necessary funds, and to carry out the work, and shall be entitled to receive from the sums payable to the branch line company, by way of net earnings or rebate, interest at 5 per cent. (or any lower rate that it may in special cases agree to accept) on funds so applied.

- (xiv) Subject to the law for the time being in force, payment out of capital will be sanctioned, during a period which may extend to the close of the half-year in which the railway shall have been opened throughout for public traffic, of such sums as, with the interim net earnings, shall be required to pay interest at a rate to be agreed upon on the paid-up capital of the company.
- (xv) Such expenses on account of administration of the branch line company as the Government of India may sanction may be charged during construction to the capital account of the company, and with effect from the date on which the line is opened for traffic throughout will be charged as follows:—
- (a) if the branch line company works its own line, as part of the working expenses of the line;
- (b) if the company's line is worked by the main line administration;
- (1) when the net earnings do not suffice to pay interest at 5 per cent. (or suffice to pay only 5 per cent.) on the paid-up share capital of the company, as part of the working expenses to be met out of the stipulated percentage of the earnings of the branch taken by the working agency:

- (2) when the net earnings exceed 5 per cent. on the paid-up share capital of the company, as a first charge on surplus profits before division ; provided that, if the surplus profits are insufficient to meet the administration charges, the balance will be paid by the working agency out of the stipulated percentage of the earnings of the branch taken by it.
- (xvi) The rates and arrangements in force on State railways as regards services rendered to other departments of State shall apply to the branch line. The branch line company shall also be liable when called on to provide, at such stations as may be ordered by Government, buildings for post office and quarters for post office staff at a charge not exceeding $7\frac{1}{2}$ per cent. per annum on the capital cost of the said buildings and quarters.
- (xvii) The Government of India reserve the right to fix and vary from time to time the classification of goods for tariff purposes and the maximum and minimum rates of each class of goods and for passengers. They also reserve a general right of control in respect of the number and timing of trains.
- (xviii) During the first year after opening of the branch line or part thereof, expenditure incurred on the maintenance of the line, may be charged to capital.
- (xix) Notwithstanding anything in the preceding clauses, expenditure due to extraordinary accidents and casualties, or to defects and their consequence in the construction of the line or in any part thereof shall be met by the branch line company, in addition to the percentage of earnings payable to the main line as working expenses, and shall be charged against the branch line net earnings, or against capital, according to circumstances, in accordance with the general usage on Indian railways.
- (xx) All agreements for lines constructed under these terms shall include a special purchase clause permitting the Government of India to purchase the lines at any time, after giving one year's notice, in the following cases :—
- (1) When the Government of India consider it desirable that the gauge of the branch line should be altered.
 - (2) When it is desired to convert the branch line into a line of through communication.
 - (3) When the Government of India desire to extend the branch line (without altering the gauge or making the line part of a through route), and the branch line company is unable or unwilling to supply the necessary capital for such extension.

In the event of a line being purchased under this clause, the price payable shall be 25 times the average net earnings (excluding payments on account of guarantee or rebate) during the three years preceding the purchase, or 115 per cent. of the capital expenditure on the line, whichever may be the greater. All payments shall be made on a rupee basis.

- (xxi) The agreements shall also include an ordinary purchase clause permitting the Government of India to purchase the lines at the expiry of 30 years from the date on which the railway was declared open for traffic or at subsequent intervals of 10 years, subject to the condition that at least one year's previous

notice of the intention to purchase has been given. The price payable on purchase under this clause shall be 25 times the average net annual earnings (excluding payments on account of guarantee or rebate) during the three years preceding the purchase, subject to a maximum of 120 per cent. and a minimum of 100 per cent. of the capital expenditure on the line at the time of purchase. All payments shall be made on a rupee basis.

4. Applications for concessions under these orders should be submitted in the forms prescribed by Memorandum A, attached to this Resolution. Copies of the forms may be obtained on application to the Secretary to the Railway Board. Requests from promoters for information as regards existing surveys, or for new surveys—*vide* paragraph 3 (iv)—should be addressed to the Secretary to the Railway Board. Applications for new surveys should contain the information required by Memorandum B hereto attached.

Resolution No. $\frac{1894}{86}$ P., dated the 7th January 1915.

Grant of special concessions to Branch Line Companies formed for the construction of Railways in Assam.

Observations.—The Government of India have recently had under their consideration the question of adopting further means to encourage the construction of feeder railways in the Province of Assam. It has been recognised that improved means of communication are essential if the material development of which that Province is capable, is to be brought about, but that, in the present partially developed state of large tracts, the immediate financial prospects of branch railways constructed in those tracts are less favourable than are the prospects of similar railways in other Provinces of India. In these circumstances, the Government of India consider that in order to encourage the formation of companies for the construction of feeder railways in partially developed tracts in Assam, some increased measure of financial assistance is required during the early years after the opening of such railways and before the country traversed has attained to that state of development to which the existence of a railway may be expected to conduce. The Government of India have therefore decided with the approval of His Majesty's Secretary of State in Council of India that the Assam Administration may in approved cases supplement the financial assistance by way of guarantee the grant of which at the charge of Imperial revenues is contemplated by the Government of India Resolution No. 457-R. P., dated the 14th November 1913.

Resolution.—In the case of branch line companies formed for the construction of railways in partially developed tracts in Assam the Government of India will be prepared, provided the conditions implied in the foregoing Observations are fulfilled, to sanction an arrangement by which, in addition to the Imperial guarantee of 3½ per cent. contemplated in clause 3 (FII) (a) of their Resolution No. 457-R. P., dated 14th November 1913, the Assam Administration shall undertake for a fixed term of years to make good to the branch line company the sum necessary to increase the rate of dividend to 4½ per cent. on the paid-up capital of the company when its net earnings are insufficient to admit of the payment of a dividend at this rate. The period during which the Assam Administration will undertake this liability must depend on the circumstances of each individual case and the prospects of early development which it presents. In all other respects the orders for the time being in force regarding the formation of companies for the construction of feeder railways in other parts of India will apply to the formation of companies for a like purpose in the province of Assam.

MEMORANDUM A.

For the guidance of persons or syndicates desirous of submitting proposals for the construction of branch railways in India forming feeders either to State lines worked by State or to railways worked by Companies.

1. All applications for leave to construct a branch or feeder railway in any part of British India are to be addressed to the Secretary to the Railway Board.

2. All such applications shall be printed, and shall be drawn up, as far as may be in Form A attached hereto, and shall specify :—

- (a) the company, person, or syndicate by whom the application is preferred; the proposed amount of capital, the number of shares and the amount of each share;
- (b) all the termini, together with the names of all the principal towns from, through, into, or near which the railway is intended to be constructed, as well as the names of each civil division and district to be traversed by the proposed alignment;
- (c) the length, so far as known, of the proposed railway;
- (d) the gauge, the weight of rails, etc.;
- (e) motive power to be employed;
- (f) the maximum tolls, rates and fares proposed to be charged on the projected railway;
- (g) the proposals for working the railway when constructed; and if any agreement is under contemplation, or has been provisionally arranged with any existing Railway Administration, under which the proposed line, when constructed, is to be leased out for working by such Railway Administration, the exact nature and terms of such agreement;
- (h) the charges proposed by the applicants for floating the branch company;
- (i) the charges proposed on account of the general administration of the branch company's affairs;
- (j) any further information that may be required to enable Government to thoroughly understand the scope of the proposals.

3. Every such application shall be accompanied by a map to a scale of one mile to one inch, with the line of the proposed railway delineated thereon, so as to show its general course and direction, and also by an estimate, as correct as may be, of the work proposed to be authorised.

4. When the applicants draw up their own detailed plans and estimates, these documents are invariably to be prepared in strict accordance with the rules for the preparation of railway projects issued under the authority of the Government of India, of which copies may be obtained on payment from the Superintendent of Government Printing, Calcutta.

5. If Government are prepared to entertain an application put forward in respect of a line that has already been surveyed, permission will be accorded on application to the Secretary to the Railway Board, to inspect at all reasonable hours, the detailed plans, sections and estimates at the disposal of Government; and copies of such plans, sections and estimates will be furnished on payment of the cost of copying.

6. But in regard to all such information, statistics, plans, sections, or estimates, which may be furnished, it is to be recognised that the information thus offered to any person interested in the matter, is simply the best information of the kind at the disposal of Government and that Government cannot accept any responsibility whatever in regard to the accuracy of any of the documents.

Form A.

To accompany all applications for leave to construct a branch or feeder railway in any part of British India.

	Nature of particulars to be specified.	Particulars.
1	The name of the company, person or persons by whom the application is preferred; the proposed amount of capital, the number of shares and the amount of each share.	
2	The termini, together with the names of all the principal towns from, in, through or into or near which the railway is intended to be constructed.	
3	The length, as far as known, of the proposed railway.	
4	The gauge proposed and weight of rails, etc.	
5	The motive power to be employed.	
6	The maximum tolls, rates and fares intended to be charged on the proposed railway.	<i>Reference to an appendix (vide next page) may be here given if necessary.</i>
7	Details of any agreement which may have been provisionally arranged, or which it is desired to enter into, under which the proposed line, when constructed, is to be leased out for working to any existing Railway Administration.	
8	The charges proposed by the applicants for floating the branch company.	
9	The charges proposed on account of the general administration of the branch company's affairs.	
10	Any further information that may be required to enable the Government of India to thoroughly understand the scope of the proposals.	

Schedule of maximum and minimum rates and fares intended to be charged on the proposed branch railway.

					Maximum. Pies per mile.	Minimum. Pies per mile.
<i>Passengers fares—</i>						
1st class	
2nd class	
Intermediate class	
3rd or lowest class	
					Maximum. Pies per mile.	Minimum. Pies per mile.
<i>Carriages—</i>						
Single carriage	
					Maximum. Pies per truck.	Minimum. Pies per truck.
Two or more carriages on one truck	
					Maximum. Pies per mile.	Minimum. Pies per mile.
<i>Horses—</i>						
Single horse	
					Maximum. Pies per 50 miles or portion thereof.	Minimum. Pies per 50 miles or portion thereof.
<i>Dogs—</i>						
Each	
<i>Parcels and luggage—</i>						
If it is proposed to adopt the rates approved by the Indian Railway Conference Association, it will be sufficient to state this fact; otherwise the rates proposed should be stated.				
					Maximum. Pies per maund per mile.	Minimum. Pies per maund per mile.
<i>Goods rates—</i>						
5th class	
4th „	
3rd „	
2nd „	
1st „	
Special class	
X class (Explosives including dangerous goods)	

MEMORANDUM B.

Information to be supplied by persons or syndicates desirous of having surveys, for branch or feeder lines of railway in India carried out at the cost of Government.

1. All such applications shall specify—

- (a) the company, person or syndicate by whom the application is preferred ;
- (b) all the termini, together with the names of all the principal towns from, through, into, or near which the survey is intended to be carried, as well as the names of each civil division and district to be traversed by the proposed alignment ;

- (c) the length, so far as known, of the proposed railway ;
- (d) the gauge and the motive power to be employed ;
- (e) the intentions of the applicants as to the construction and working of the railway.
If it is intended that the working shall be leased to any existing Railway Administration, the nature of the contemplated agreement shall be specified.

2. Every such application shall be accompanied by a map to a scale of one mile to one inch, with the line of the proposed survey delineated thereon, so as to show the general course and direction.

Appendix C.

Rules embodying the principles to be observed in determining the headways and waterways under railway bridges over navigable channels in Assam and Bengal (circulated with Government of India, Railway Department (Railway Board) letter No. 65-P.-16, dated 1st May 1920 and No. 65-F./16, dated the 4th May 1921).

In the case of rivers on which steamer services are already established full provision should be made for these services by the railway. Reasonable provision should also be made at railway cost for any development of river traffic that can be shown to be definitely in sight when the construction of a railway is taken in hand.

2. In the case of rivers which are navigable but which have not hitherto been served by steamers, the railways should not be called upon to provide greater headways or wider spans than are necessary for the passing of flood water and country boats of the largest size among those which habitually use the stream unless the steamer companies can show that there is a genuine prospect of river services being opened within a reasonable period and that such services are required in the public interest. What is a genuine prospect and what is a reasonable period are questions of fact to be decided in each case as it arises.

3. As regards rivers which are unsuitable for steamer traffic, railways should not be required to provide any facilities for steamer services, since possible improvements in the future must be purely hypothetical. Whether a river is suitable or unsuitable for navigation should be decided by the local Government after hearing the steamer companies and the railway concerned.

4. In all cases other than those mentioned in clauses 1 and 2, steamer companies should provide the whole or such portion, as the Government of India may in each case determine, of the additional cost of any increase of span or headway which they desire should be provided and which is not necessary for the purposes of the railway.

5. Headways should generally be calculated above the normal high flood level, taking, if possible, an average of not less than ten years' recorded high flood levels.

6. In fixing headways it must be remembered that if railways are required to make bridges high enough to pass all established steamer traffic, steamer companies, on their part, should reasonably be expected to adopt a suitable type of steamer with dipping funnels, kept as low above water level as possible, so as not to raise the cost of bridges unnecessarily. It is considered that standard types of steamer, requiring headways as detailed below, will be suitable for all kinds of river traffic:—

	14 feet
	20 „
	28 „
	35 „
	40 „
over	40 „ (with the previous approval of the local Government.)

With the steamers classified thus, it will merely be necessary, in order to determine what headway should be provided over a river in any given case to decide for what particular type of steamer the bridge should be constructed.

7. If the cost of providing the required headway should prove excessive, lifting or swing bridges may be substituted for fixed spans ; in that case provision must be made for opening the movable span at reasonable intervals so as not to obstruct the steamer traffic unnecessarily.

8. Provision should be made for country boat traffic in the case of all rivers on which country boats ply or it is possible for them to ply.

9. In regard to the waterway to be provided, in any given case, provision should be made for spans of width sufficient to pass steamers with two flats alongside in the case of large rivers and steamers with one flat alongside in the case of smaller rivers.

10. Disputes or differences of opinion in particular cases should be settled in respect of each case by the Local Government after reference, if required, to a local committee representative of all interests and presided over by the Commissioner of the Division or Valley concerned.

In the case of the Province of Burma only, before a railway bridge is constructed over any navigable channel the design must first be approved by the Advisory Board of communications of that Province. This Board will also adjudicate in all cases of dispute which may arise in connection with headways and waterways in the Province.

Appendix D.

Resolution No. 2121-E.-19, dated the 28th April 1920.

Training of educated Indians in Mechanical Engineering.

The Government of India have had under consideration the report of the Indian Industrial Commission which in paragraph 155 draws attention to the predominant importance which mechanical engineering is now beginning to assume in India, and to the fact that the development of Industrial enterprises involving the employment of mechanical engineers and trained supervisors has hitherto depended almost entirely on the employment of imported staff. Although many engineers are found in charge of small running plant, yet the subordinate and superior supervising staff in large engineering workshops are almost entirely European or Anglo-Indian. It is clear, however, that if the advance of Indian industries is to proceed on the hoped-for scale and if it is to be of real benefit to the people of India, there must be not only a great increase in the number and skill of artisans, but a class of Indian foremen and mechanical engineers must be created.

2. The Industrial Commission have also expressed the opinion that, in respect of mechanical engineering, in its various branches, the only satisfactory method of producing foremen and officers is by a system of apprenticeship in commercially managed engineering shops combined with theoretical training, preferably imparted in class rooms near the shops and under the same general control. They especially emphasise the necessity of this system in India where the home surroundings of students belonging to the educated middle-classes do not familiarise them with industrial conditions, and, where the students themselves have been hitherto more inclined to the theoretical than to the practical forms of training. This important pronouncement is based on an examination of the working of the apprenticeship system in several railway shops; and makes it clear that the great railway workshops of India, which form the most important part of the country's equipment in respect of mechanical engineering, must necessarily play the main part in the training of mechanical foremen and engineers, as well as of artisans.

3. The Government of India take this opportunity of expressing the hope that in the near future a large body of well-qualified men with a mechanical training will be created from among the educated middle-classes. Until recently there has been comparatively little readiness exhibited by these classes to pass through the severe and unaccustomed form of training which the profession of mechanical engineering requires; but, during the past few years, there have been increasingly hopeful signs of a change in this respect. On the other hand, the system of apprenticeship in railway workshops in the past gave little or no scope, and only poor prospects to youths of these classes. Outside the railways, too, there was no great demand, till comparatively recent years, for Indian foremen or mechanical engineers.

4. It will be of interest to recite briefly what has been done by the railways in recent years to provide for their own requirements and at the same time, to a certain extent, to meet the needs of the country generally through their apprenticeship systems.

It is not too much to say that the railway shops of India have in the past served as the chief training ground for mechanical artisans for the whole country. Youths of the working class enter the shops and after a more or less complete course of training as artisan apprentices, either remain in the shops as artisans or take up similar employment elsewhere. There is, however, an absence of system in the complete training of these youths; they are

usually uneducated, or only partially educated when they commence their apprenticeship; and arrangements for the very elementary forms of theoretical teaching they need are inadequate or non-existent.

5. The ranks of foremen, assistant foremen, and chargemen are filled ordinarily either by imported Europeans or by Europeans and Anglo-Indians brought up in the country and trained in the railway workshops. In the latter case, though the system has produced many competent men, some of whom have risen to important posts on railways and in private firms, it still leaves much to be desired. The theoretical training has been as a rule conducted by an inadequate and insufficiently qualified staff; and there is usually an absence of adequate supervision of the work of apprentices in the shops. The directions in which the training given at present needs improvement are sufficiently obvious. The scheme which has been in force for two or three years past on the Eastern Bengal Railway at Kanchrapara is an interesting example of the lines on which railway apprenticeship training is now developing.

The arrangements at Kanchrapara for educated Indian apprentices are as follows :—

Residential accommodation has been provided for 28 first class Indian apprentices who draw a monthly stipend rising in five years from Rs. 18 to Rs. 30. They receive their practical training in the workshops and obtain elementary theoretical instruction four hours weekly from teachers who are members of the railway staff and are paid for this work. The rules require that these apprentices shall be Matriculates and there is no lack of suitable candidates. Proposals have been recently put forward by a Committee appointed under the orders of the Government of Bengal for a more advanced scheme at Kanchrapara including the entertainment of a separate and highly qualified staff, and the erection of a hostel for Indian students and of a technical institute in which the classes would be held. The Committee hoped that it would ultimately be possible to bring into force similar schemes in connection with the East Indian and the Bengal-Nagpur Railways' shops, as well as at certain other engineering works, and to provide a post apprenticeship training at the Sibpur College. It was also suggested by the Committee that the general organisation of the whole system of apprenticeship training might be placed under a Board of Control, on which the railways, the engineering firms, and the Sibpur College would be represented.

6. In the case of the officer class, till recently very little has been done in the country to recruit either from the ranks of Europeans or Anglo-Indians, and even less in the case of Indians, with a view to enable promising apprentices to obtain further training in England, and to qualify eventually for officers' posts. Certain railways have introduced schemes providing the necessary pecuniary aid. It may be hoped that the Bengal Committee's scheme may assist in due course in providing Indian recruits for this class.

7. This brief account of the part hitherto played by the railways of India in providing artisans and foremen, not only for their own needs, but also for the industries of the country generally, indicates the direction in which further progress can be made. The Government of India are confident that the managements of the various railways are sufficiently alive to the needs of the time, to do everything possible to create a system which will give middle-class Indian youths an efficient system of training and thus fit them to take their share in the great work of equipping India with skilled mechanics and supervisors, the sinews that actuate the industrial frame.

8. It is needless to enter into details regarding the precise form of scheme that should be adopted. This may not always be the same in every case, and will have to be prepared

to suit the conditions of each railway on which the improved system is introduced. The Government of India, however, desire to point out that the railways cannot be expected to bear the cost of training apprentices in their shops in excess of their own requirements, and the help of local Governments may reasonably be asked to enable expenditure on further developments to be met. The Government of India have recently given considerable grants to local Governments to assist them in meeting such calls.

It is also necessary to explain that there is a limit to the number of apprentices that can be trained in any workshop, imposed partly by its size, and partly by the nature of its work and the extent of the supervision available.

9. The Government of India trust that the question of the improvement of the apprenticeship system will be approached by railways and local Governments in full co-operation, and with the determination to open widely, in the interests of the industrial advancement of the country, the excellent training ground presented by the railway workshops, and that the shop management and staff will bring to the task the same spirit of energy and progress which has raised the railway shops to their present high level of efficiency.

10. This Resolution deals principally with railway workshops but the Government of India are fully aware of the excellent work done by local Government workshops and those owned by private firms, in training apprentices, and they feel sure that non-railway workshops will do their best to improve their systems of training on lines best suited to each individual concerned.