



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

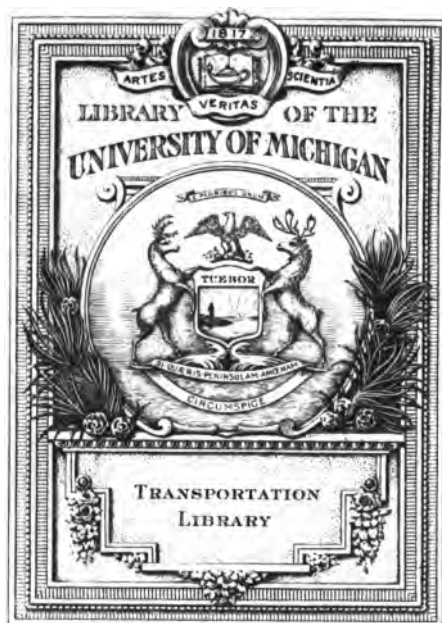
About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

A

756,606

DUPL



(318)

REPORT
UPON THE PRACTICABILITY AND ADVANTAGES
OF THE INTRODUCTION OF
RAILWAYS

119
INTO
BRITISH INDIA;

WITH

COPIES OF THE OFFICIAL CORRESPONDENCE WITH THE BENGAL
GOVERNMENT, AND FULL STATISTICAL DATA RESPECTING
THE EXISTING TRADE UPON THE LINE CONNECTING
CALCUTTA WITH MIRZAPORE, BENARES, ALLA-
HABAD, AND THE NORTH-WEST FRONTIER;

COPIES OF MISCELLANEOUS CORRESPONDENCE; AND DOCUMENTS WITH
PLANS AND SKETCHES IN ILLUSTRATION,

BY

R. MACDONALD STEPHENSON, C.E.,

*Associate and Corresponding Member of the Institution of Civil Engineers
Member of the Asiatic Society of Bengal and of the Bengal
Agricultural and Horticultural Society, &c., &c.*

LONDON:

PRINTED BY KELLY & Co., 19 & 20, OLD BOSWELL COURT,
TEMPLE BAR.

1845.

11/15



R E P O R T
UPON THE PRACTICABILITY AND ADVANTAGES
OF THE INTRODUCTION OF
RAILWAYS
INTO
BRITISH INDIA;

WITH

**COPIES OF THE OFFICIAL CORRESPONDENCE WITH THE BENGAL
GOVERNMENT, AND FULL STATISTICAL DATA RESPECTING
THE EXISTING TRADE UPON THE LINE CONNECTING
CALCUTTA WITH MIRZAPORE, BENARES, ALLA-
HABAD, AND THE NORTH-WEST FRONTIER;**

**COPIES OF MISCELLANEOUS CORRESPONDENCE; AND DOCUMENTS WITH
PLANS AND SKETCHES IN ILLUSTRATION,**

BY

Macdonald
R. MACDONALD STEPHENSON, C.E.,

*Associate and Corresponding Member of the Institution of Civil Engineers
Member of the Asiatic Society of Bengal and of the Bengal
Agricultural and Horticultural Society, &c., &c.*

L O N D O N :

**PRINTED BY KELLY & Co., 19 & 20, OLD BOSWELL COURT,
TEMPLE BAR.**

1845.



Transport.

Transportation

Library

HE

3297

.583

1845

MS. B. 4. 1. 1. 4. 5. 6.

To WILLIAM WILBERFORCE BIRD, Esq.

§c. §c. §c.

LATE DEPUTY GOVERNOR OF BENGAL.

London, Nov. 26, 1844.

SIR,

I CANNOT more appropriately address the few observations I have made upon the valuable documentary evidence contained in the following pages, than to one from whom I have received so much encouragement to proceed in an undertaking which is calculated to bestow more substantial and lasting benefits upon British India, in every point of view (politically, morally, and commercially), than have been conferred by the introduction of any previous measure of amelioration or improvement.

That you may long continue in the enjoyment of the merited fruits of a useful and well spent life,—and that you may live to witness the vast changes throughout the country, as well as the full extent and influence of those incalculable advantages which will have had their origin in, and owe their existence to, one of the last acts of your administration of the Government of Bengal, is the earnest and sincere wish of,

SIR,

Your obliged and faithful Servant,

R. MACDONALD STEPHENSON.

REPORT.

1.

1. The development of the resources of British India had engaged my attention for a period considerably antecedent to my visiting that country, by which I was enabled, from the opportunities thereby afforded, to confirm by personal observation and inquiry, the impressions previously entertained upon the subject. Among my first endeavours to accomplish the object in view, and as a necessarily preliminary step, in a country in which the construction and uses of a railway were scarcely known or appreciated, I from time to time published in the Native as well as in the English local journals, the reports of the various European Railway Companies, with statements of their expenditure and income, the traffic in goods and passengers, as well as the general effect which has been observable in every district through which a line of railway has been laid down.

Subject considered before visiting India.

First steps taken to show value of Railways in other countries.

By these means, the public mind became familiarised with the operation and advantages derived by other countries from the application of this mode of transport, which has already induced a strong and decided feeling in favour of the early introduction of similar measures in India.

Public mind impressed with importance of Railways, and anxious for their introduction into India.

With a view to provide the necessary materials for duly estimating the relative advantages of the different lines upon which, from the known extent of trade, it appeared probable that a railway would prove remunerative, I commenced a series of papers, of which the annexed * introduction will show the ten-

Series of Papers relative to internal trade of India, undertaken to ascertain whether Railways would be required.

* *Extract from the Calcutta "Englishman" newspaper of 1 Jan. 1844.*

PROGRESS OF PUBLIC WORKS IN INDIA.

In the consideration of the important subject of the public works of India, we had hoped to have been enabled to avail ourselves of certain sources of information in which we have been disappointed. The only effect of this is to occasion some little delay, and increase the trouble on our parts to obtain indirectly through other sources that information which we might have had direct, and at once.

Our object in these papers has been already sufficiently defined to render any recapitulation here unnecessary, beyond naming that the per-

dency and usefulness, and which I purpose to complete hereafter throughout the several lines laid down on the accompanying map.

Opinions of Government & of Indian public such as to induce publication of documents already collected.

The time having, however, arrived for imparting to the subject a more practical and substantial form, as appeared from the disposition entertained on the part of the Government, and from the evident expectations and wishes of the Indian public generally, and having, moreover, completed the collection of the documents which appertain to the line of country between Calcutta and the great central entrepôt for merchandize and produce of all descriptions at Mirzapore, I have been induced to submit the whole of the valuable information already collected by myself and by others who have for some years past been so engaged, and

manent interests of India, and the means of increasing its value as a British possession, are the end and aim to which our observations are directed,—and towards which end we confidently look forward to the cordial co-operation of the many friends and supporters of the paper, who have the opportunity of contributing to the promotion of the same object.

The public works of India must be regarded rather as what are to be, than what already exist—though, considering the limited means placed at the disposal of the Governor General for this especial purpose, infinite credit is due for the extent, as well as the judgment displayed in the selection, of the many important works which have already been executed in various parts of the country.

For the sake of perspicuity, we shall consider the several subjects in succession, and classify them under the respective heads of,

1. Railway communication considered in a military as well as commercial point of view.
2. Canals, and river navigation.
3. Bridges—suspension, stone, wood and cast iron.
4. Miscellaneous public buildings for barracks, docks, &c., for drainage, sewerage, supplies of water, lighting, &c. &c. &c.
5. As to the assistance, and encouragement given to private enterprise in the experimental cultivation of indigenous produce, and as to the expediency of extending such co-operation, under certain limitations.
6. Upon the limited operations carried on in the manufacture of iron, the raising of coal, and in the general working of the metalliferous veins which are so abundant throughout great part of India—with suggestions.
7. Upon the sugar, indigo, cotton, oil, salt, and other works of the country—with statistical tables in reference to the production of the last five years.

No. 1

RAILWAY COMMUNICATIONS THROUGHOUT INDIA.

The accompanying map embraces such lines of Railroad, as, should the adoption of this mode of conveyance ever become general (of which we have no doubt), would constitute the principal branches. That the construction of the complete system laid down will not be simultaneous we are perfectly aware; but our observations are intended to apply to the future as well as to the present, and the grounds upon which we have adopted the particular lines laid down in the map, will be defined in successive

who have kindly placed their papers at my disposal, and to recommend that a commencement should be made upon this line without delay, pending the construction of which, the statistical returns, surveys, &c., of other districts will be obtained for future consideration, in the event of the inducements held out being such as to justify their being undertaken, on the completion of the first line.

Recommendation that Mirzapore line be at once commenced.

2. The documents above referred to will be found elsewhere in the order and rotation already specified, and they will, it is confidently believed, be admitted by all unprejudiced persons, to present such a connected chain of conclusive evidence as to justify the immediate establishment of a public Company for the pur-

Documents such as to induce greatest confidence in result of such an undertaking.

numbers of this series of papers, when all can estimate equally the probability of our views being confirmed by experience after the plans laid down shall have been carried out, and the advantages of them are in course of being generally felt and appreciated.

We shall thankfully receive any information respecting local circumstances which may be supposed to affect any particular district referred to, and which bear upon the question of inter-communication, and we trust that those of our friends and readers who may possess the opportunity of sending such information, will kindly do so upon all convenient occasions. As regards the natural obstacles which have to be overcome, they are matters for consideration when the detailed plan for each particular line may be brought forward, and when accurate surveys shall have pointed out the most eligible course for each line to take.

The general description simply indicates the great lines requiring in this country especially, to be protected by military force, which is of necessity increased or diminished in proportion to the facilities or difficulty with which their transport from one to the other part is effected.

The first consideration is as a military measure for the better security with less outlay, of the entire territory, the second is in a commercial point of view, in which the chief object is to provide the means of conveyance from the interior to the nearest shipping ports of the rich and varied productions of the country, and to transmit back manufactured goods of Great Britain, salt, &c., in exchange.

The extent to which in the several districts in which we look forward to see this means of conveyance generally introduced, the cultivation of opium—indigo, sugar, rice, and grain, are cultivated, and whence saltpetre, shell lac, drugs, minerals, metals, and spices, are brought, and for which the returns at present received in salt, and European goods are so considerable, will be fully entered upon in the consideration of each particular line; and will be accompanied by statistical and authentic documents, upon which the expediency of, or objection to the plans can be determined.

We propose after carefully investigating the several claims of each line on account of its greater commercial importance—its more economical construction or from whatever other causes it may be entitled to precedence, to point out the means by which the projects themselves, after they shall have successfully undergone the strictest scrutiny may be carried out, without entailing any expense upon the Government, directly or indirectly.

Our suggestions may be cavilled at—but, until the grounds upon which

Railways once commenced will be extensively carried out. pose of taking the first step towards the introduction of a means of intercommunication throughout India, which, when once commenced, will only cease with the completion of the entire system laid down.

Especial inquiry directed to cause of failure of Calcutta Companies. 3. Among the principal subjects which attracted my especial attention, and into which I deemed it expedient to make more than usually strict enquiry, were the causes which had led to the comparative failure of so many of the speculations which for several years past have been brought forward in Calcutta; and, however much the circumstance is to be regretted as regards the past, the result of this inquiry is most satisfactory in respect of any future undertaking in which the occasion of former failures can readily be avoided.

Mismanagement the occasion. The single evil to which to attribute the want of success in the majority of the measures referred to is mismanagement, to which, in most cases, the disastrous consequences are palpably and directly traceable. That there are, and always will be, exceptions to the rule there is no doubt; but it may be assumed with considerable accuracy that no undertaking of magnitude in which other than local capital is invested should ever be embarked in, of which the sole and irresponsible control is placed under Calcutta management.

Corroborative evidence unnecessary. It will not here be necessary to adduce instances of the occurrences upon which this opinion is based, as the results are too well known to need more particular reference. Neither do I desire to be understood as imputing wilful or intentional malpractices, to any of the parties referred to. It is enough for the pre-

Wilful mismanagement not imputed.

they are given shall have been clearly stated, it is impossible to justly estimate the question—and we feel very confident that, when the connected circumstances are thoroughly understood, there will be few dissentients from those views which we have long entertained, and already upon former occasions, given expression to.

We have a similar map in course of preparation for the purpose of showing the canal and river navigation of the country—the improvements already in contemplation or operation—and the advantages which would attend the cutting new canals, and by directing the sources—by dredging—or by other means, improving and rendering the rivers more securely navigable than they are at present.

The object in both cases is to elicit such an unprejudiced and faithful account, supported by full and authentic statistical details, of the comparative advantages to be derived from the adoption of the one or the other means of extending the facilities for intercommunication between the vast productive regions of the interior, and the natural outlets for their produce—the nearest and most eligible shipping ports.

The third will be a more detailed map embracing the geological and mineral features of the country—and indicating the produce, and traffic of the several districts arranged with a view to the explanation of the accompanying papers.

sent purpose to know that the result (which probably arises chiefly from the inability which exists among the majority to devote that degree of personal attention to other subjects than those immediately connected with their own business) has been in most instances singularly infelicitous ; and that too much care and circumspection cannot be exercised in the adoption of such other means of accomplishing the end in view, as shall prove an effectual preventive against such contingencies.

Result to Shareholders the same.

And care necessary to avoid recurrence.

The means of avoiding the recurrence of the practice are attainable when the cause has been ascertained and indicated, and there can be no doubt but that, provided this objection (as it may without difficulty, be got over, and the chief management of such important undertakings in India as that under consideration be retained in England, giving only such delegated authority, and limited as well as revocable powers, to a few judiciously chosen, well-paid, and responsible persons, who will undertake to act as a local Committee, upon the instructions conveyed to them by the Board, there can be no fear of the result. By these means, and by retaining the power of removing and replacing any of the Committee, at the discretion of the Board, the possibility of mismanagement under any circumstances, will be diminished to such an extent as to render any apprehensions on this head superfluous, and it will ensure the most ample justice being done to the interests which are placed in the hands of parties so elected.

Cause being known, remedy applicable.

Recommended to delegate limited powers only.

To retain power of removal of Local Committee.

Calculated to secure attention to the interests represented.

With a view, therefore, to this particular object, the draft of the deed or constitution under which it is proposed that the Railway Company shall be carried out, has been most carefully prepared and improved by an eminent barrister in Calcutta, whose attention has been directed to the most effectual means of accomplishing the objects of the Company, and of avoiding the disasters of preceding speculations.

Draft of a deed prepared in which provision made for management.

To the mismanagement, and consequent failure of so many of the early speculations which have originated, and have been carried out, in Calcutta, must also be attributed the delay which has occurred in what would, under other and different circumstances, have unquestionably taken place—the employment to an almost unlimited extent of British capital in the development of those inexhaustible resources with which India abounds, and which alone require the steady and judicious application of such capital, under sound, able, and honest management, to ensure to all parties the most ample returns, and to yield advantages far exceeding the limits of ordinary calculation and belief.

Mismanagement and failure of former schemes the cause of delay in undertaking Railways and other beneficial measures.

The importance of introducing into India a new and improved mode of conducting public undertakings upon the basis on which similar measures are carried on in England, can scarcely be too highly estimated,—the vast field which is afforded, and which alone requires capital to render these advantages available, is universally admitted,—the means by which to develop these

Importance of introducing English mode of conducting public companies.

Resources of the country admitted by all. resources with certainty, security, and without risk on the part of those who engage in it, is the chief point for consideration, and this, it is conceived, will be fully attained by the adoption, in its present or in a modified form, of the course above laid down.

Bombay railway shares all taken and 4,000 in excess applied for. The success which has attended the publication in India of the prospectus of the Great Eastern Railway at Bombay, in which applications were made for upwards of 4,000 shares in excess of the number issued or required, might have induced the adoption of a similar course in regard to the Bengal Railways; but, in deciding otherwise, I have been guided by the advice and counsel of experienced and influential parties who desire to see the undertaking effectually accomplished, and who fully coincide in the

Reasons for not publishing in India, with above for a precedent of probable results. opinion I have deliberately formed, and which I have already as decidedly expressed, that the management of such an enterprise should not be placed in the hands of an irresponsible local Board in India; but that to ensure the attainment of the full benefits to the Shareholders of which the undertaking is susceptible, the management will require to be provided for as above suggested.

The line will probably connect Calcutta and Bombay. 4. There are strong grounds for believing that the proposed Railway will hereafter connect Calcutta with Bombay, by a line passing along the valley of the Nerbudda, as there are several objections to the more direct route which has been suggested; among which may be mentioned the comparative trade upon the two lines—the one already existing, the other having yet to be made—and the construction of the one line being attended with less loss of life than the other, from the unhealthiness of the districts traversed; whereas the advantage in time of the direct over the longer line will not exceed a few hours.

Mineral wealth of India shown in reports of officers and others in service. Were it desirable to adduce in evidence of the unexplored wealth of the country, the existence of minerals of the finest quality, and almost in indefinite extent, it would not be difficult to present such a statement upon the concurrent testimony of the several officers of Engineers and others, who have from time to time explored and reported upon the various districts in which they abound.

Coal districts alone require present consideration. It is, however, unnecessary to enter upon this subject further than to direct attention to the profusion which characterises the distribution of the coal measures throughout the country, and to mention that coal of the finest quality can be obtained in very many parts of India, both for the continually increasing supply required by the steamers, factories, &c., and for exportation to the Eastern settlements.

Abundant throughout India.
Coal Committee engaged in ascertaining value of various coals. The exertions of the Coal Committee have been for some years directed to this inquiry, and to Dr. J. M'Clelland, one of its most indefatigable and able members, who has also acted as their secretary, I am indebted for much valuable and interesting information upon the subject,

The Reports of the Committee, drawn up by their secretary contain much important information, from which I have made some brief extracts, and whereby I have been enabled to add the geological sketch of Upper India, with a map of the coal measures which up to the present period have been ascertained to exist. To the late Mr. James Prinsep, for the first portion, and to Dr. McClelland, for the last, I have to acknowledge the tabular statements of the relative specific gravities and constituents of the several descriptions of coal upon which experiments have been made—and in referring to these, it should be borne in mind, that in no instance, the Burdwan coal, perhaps, excepted, has a sufficient expenditure been incurred to admit of the mining operations being carried to an extent and depth which would secure the best coal, but the surface or shallow seams have alone been selected, and must be regarded as indicating the existence of a much superior quality, whenever the proper means shall be adopted for obtaining it.

Extracts made from Coal Committee Reports.

Tabular statements taken from Prinsep and McClelland

Surface coal alone tested, results indicate existence of superior qualities.

Upon this subject I shall be enabled hereafter to complete a more detailed account of the coal deposits in India, with especial notices of the several descriptions of coal, accompanied with a general report upon the entire coal formation of India, which is in course of progress, by Dr. McClelland, to whose exertions in the cause in which he has been engaged, I have already borne testimony.

Future memoir on coal formations in preparation.

5. It has already been mentioned that the statistical returns of the traffic in goods and passengers, as well as the cost of conveyance between Calcutta and Mirzapore, have been obtained, and the extent of the trade is sufficient to justify measures being taken to improve the means of transport by laying down a railway between these two places, which should pass through the rich and productive district of Burdwan. The uniform and gradual inclination of the road from Howrah (opposite to Calcutta) to Ransegunge, where the principal collieries are opened, presents advantages which are rarely to be obtained upon a line of equal length, and as this portion of the great line would, upon its completion, yield an independent and considerable income, it would be most advisable that to this extent the line, which has been carefully surveyed upon a former occasion, should be first completed, and the interval be occupied in completing the surveys and levels of the remainder; the more especially as it is a question in the minds of many, whether after passing through Burdwan, the direct trunk road to Mirzapore, or the more circuitous route along the Valley of the Ganges, would present the greatest advantages, and as, in either case, the line to the Burdwan collieries would form a part of the plan, it would in this respect signify little, in the first instance, which direction shall be adopted. It is the opinion of most qualified men, to whom application has been made upon the subject, that £8,000 per mile will suffice to

Statistical returns of Burdwan trade such as to warrant laying down a railway.

Inclination uniform and gradual,

Advisable to commence Burdwan portion of line while remainder is surveyed in detail.

Burdwan line required under any circumstances.

Cost of line estimated at £6,000 per mile.

£8,000 per mile assumed to cover all contingencies. complete the entire distance, taking the level parts of the country as well as the hilly districts and rivers into consideration ; but it may be more satisfactory to increase the amount to £8,000 per mile, a sum more than sufficient to cover every contingency.

Recommends proceeding at once. Upon this basis I most strongly recommend the undertaking being commenced, provision being made to complete the entire line, but the smaller portion being proceeded with and opened at the earliest possible period.

Of the result, the documents above referred to will admit of a correct estimate being formed.

Three lines to Mirzapore practicable, the best to be selected, while first portion in course of construction. The lines upon the plan of the railway from Calcutta to Mirzapore, have been laid down by, and are referred to in the communication of, Capt. A. S. Waugh, the Surveyor-General of India, who expresses his decided opinion in favour of examining the three lines which he believes to be practicable, and selecting from them whichever shall offer the greatest advantages, with the least difficulty and expenditure ; and the majority of those upon whose experience reliance may be implicitly placed, coincide in this opinion, less from any decided impression that the longer line will be found preferable to the one originally proposed, than because the investigation will entail but a moderate expense of time and money ; and as it may be conducted while the first, and, under any circumstances, the essential, portion of the line is in course of construction.

Survey costs but little, and entails no delay. because the investigation will entail but a moderate expense of time and money ; and as it may be conducted while the first, and, under any circumstances, the essential, portion of the line is in course of construction.

Recommends comprehensive title for Company 6. I would also recommend that the proposed Company should be incorporated under the title of the " EAST INDIA RAILWAY COMPANY," with a view to their carrying out in succession the several lines of Railway in India, which may appear desirable, for the especial reason that the experience which the Company will have acquired in the construction of the first line, from Calcutta to Mirzapore, will enable them to undertake the

To admit of their carrying out other lines. other lines, under infinitely superior advantages and with much greater confidence, both on their own parts and on that of the

On account of greater confidence due to their experience on first line. public, than can be enjoyed by any other parties ; and, there is no doubt but, that, under judicious management, this Company will, at no distant period, become one of the most important and beneficially influential of any Railway Company yet established.

Results of construction of railways. 7. The establishment of schools upon the European principle, in the several sanatoria in India, and the ready access afforded to them by means of Railways, will do much to alleviate one of the most severe privations and hardships to which

Establishment of schools in the sanatoria. every resident in India is to a greater or less extent subjected—the continual separation from one or more members of his family, who, in lieu of proceeding to England, the Cape, or other distant parts, for the purposes of health, education, or change, will be enabled within a few hours, to accomplish their object as effectually as at present can only be obtained at a very con-

siderable cost of time and money, and at a sacrifice of personal feeling and anxiety to which there are few who cannot bear ready testimony from their own sad experience.

8. I would further suggest, to prevent as much as possible the speculation in shares, which a less amount is calculated to facilitate, and to render this stock one for permanent rather than for temporary and speculative investment, that the shares should be fixed at not less than £250 each; the more especially as the payment of the several instalments will of necessity extend over a period of several years.

9. Without presuming to offer an opinion upon the possibility of carrying the Railroad system in England beyond those prudential limits which experience has shown to exist in all similar undertakings, it would appear, from an examination of the results which have attended the few principal lines, as compared with many of the others, that to provide for the efficient communication of any country, a certain number of main lines is required, which cannot be exceeded with any advantage, although tributary branches may be constructed with equal benefit to themselves, and to the main trunk lines; and that, after completing the lines of communication between the most important towns of the United Kingdom, the extension of similar benefits to those of the British Colonies, in which their value would be most fully appreciated and usefully applied, is a subject well deserving the earnest and serious consideration of all persons interested directly or indirectly in their welfare—the more especially when it is remembered that the British Colonies exceed one-sixth of the entire land-surface of the globe.

If other than the existing inducements were wanting to recommend this course, it will only be necessary to refer to the following extract from the "Quarterly Review," in regard to the vast sums invested in domestic and foreign speculations, and to their relative present and prospective value both to the country, and to the parties directly interested in them.*

Saving of expence, &c., in obtaining change for health.

Suggest £250 shares for reasons assigned.

English railways should not exceed a certain number of main lines.

After completion of which, the interests of the colonies require the application of the same measures.

British colonies one-sixth of the globe.

Comparative value of investments in foreign and domestic securities.

* The British capital invested in railroads—expensive, if you will, but solid, enduring, vivifying works—is about £80,000,000. The capital risked—we fear we might say *lost*—in Foreign Loans is computed at not less than £121,000,000; whereas the £80,000,000 invested in our railroads are not only represented by solid works and substantial property, but pay, on the average, 5 per cent., that is, 2 per cent. more than the public securities of the state; for, though it is true that some of these undertakings pay at present but little interest, and others less than 3 per cent., yet we believe the *average* is quite as great as we have stated it, and in such a case as this, the average is peculiarly important, because the great capitalists are understood to be mixed up in many of these concerns, and it is satisfactory to believe that a great body of those who might suffer from the depressed shares are, fortunately, holders also in the more bene-

References to other extracts from Quarterly Review for June, 1844.

The pertinent and able remarks which appeared upon the subject in the same number of the "Quarterly Review" (June, 1844), and from which I have made some extracts, bear strongly upon several points which, although written in reference to English Railways, are no less applicable to those to be constructed in India; and the dispassionate characters and singleness of purpose which mark the majority of the articles upon this and similar subjects in that periodical, afford additional confirmation of the reliance to be placed in the opinions and suggestions which appear in its columns.

Extracts from "Railway Reform."

Capital invested in Railroads.

Increased value.

Dividends paid on 24 lines.

10. From a pamphlet recently published, under the title of "Railway Reform," it appears that of a capital of £63,000,000 invested in 55 railroads, of the aggregate length of 1,732 miles, in the United Kingdom, the 24 principal lines, of 1,014 miles, which have cost £28,000,000, are now worth £48,000,000, and that they are paying an average dividend of 6½ per cent. upon the original outlay, of which the London and Birmingham Railway, to which the proposed Calcutta and Mirzapore line bears a close analogy and resemblance, as regards the relative traffic between the two termini, is paying 11 per cent. on the original capital expended; and that these 24 railways have cost on an average £36,910 per mile; whereas, from the level character of a considerable portion of the country throughout India, from the absence of any heavy Parliamentary expenses, from the cheapness of labor and materials, and from the moderate cost of the land, if purchased by the Government of Bengal for the Company as being applied to a public work, the cost of a railway in that country will not, on an average, exceed one-fourth of that amount, while the extent of traffic, if it does not exceed, is very little below that from which, even at the above heavy original expenditure, a dividend of 11 per cent. has been derived.

Average cost per mile of 24 lines.

Diminished cost in India for reasons alleged.

Traffic equal to English lines.

Working expenses not above European charges.

The working expences, although an increased charge will be necessary for the payment of European superintendence, will not exceed the aggregate amount of the European charges, in consequence of the less number of intermediate stations on the line, and as there will not be any charge for rates, duties, &c.,

ficial lines; to which may be added £6,464,000 of British capital paid up on foreign mining speculations, described, in Spackman's statistical tables (p. 151), as 'being, with one or two exceptions, utterly worthless, and an entire loss of the capital embarked in them;' and also a £4,500,000 paid up capital on British Mining Companies, designated, by the same authority, as 'not only complete failures, but memorable proofs of the folly and cupidity of British capitalists, on the one hand, and of the knavery of their projectors, on the other' (*ib.* p. 153)—making a total of capital—nearly unproductive, where not entirely lost—of upwards of £120,000,000.

which on the Birmingham line amounts to upwards of £49,000 a year. No duty or rates charged.

The moderate charges for passengers and goods on the English railways, as compared with the amount at present paid in India for conveyance, will be observed by reference to the annexed documents, and will sufficiently account for the indisposition to locomotion which generally prevails, unless compelled by business or other equally imperative and urgent causes. Comparative cost of conveyance in England and India. A bar to travelling.

A Calcutta merchant who desires to visit Mirzapore must incur an expenditure of £70, and a loss of six weeks, if he avails himself of the Steam vessels, and if he proceeds by Dak the amount will be nearly the same, and the period required to perform the distance there and back will be about ten days of unremitting and most fatiguing travelling. Expense incurred by merchants travelling to Mirzapore.

The Railway will enable him to perform the entire distance to Mirzapore and back to Calcutta in thirty hours, and at an expense, if the English rates were adopted, £11 4s., £7 18s., to £5 1s. 8d., according to the train which might be selected. These rates would, however, be unnecessarily low, and an intermediate price would be readily paid, and unquestionably induce very many to avail themselves of the facilities offered, who are at present of necessity prevented by the delay and loss of time, more than on account of the expense which is entailed. Expense by a Railway of same journey. Many would travel if the facilities were increased.

11. A circumstance which may require to be noticed is the general terms in which my application was addressed to several of the commercial houses in Calcutta, with a view to ascertain their opinions of the effect upon the commerce of the country of the adoption of railways as a means of transport. I considered it preferable to ascertain the unprejudiced opinions, founded upon their own commercial experience, of these gentlemen, rather than to influence their decision by submitting the documents which might, in that case, have been considered as determining opinions, which, having been uninfluenced, must be regarded as by so much the more valuable. Application to mercantile houses made purposely in general terms. Grounds for not furnishing details.

12. I have to acknowledge my very great obligation to several parties whom it will not here be either needful or pertinent to particularise, for the liberal manner in which the whole of the information they had collected, with copies of correspondence, and other documents bearing directly or indirectly upon the subject under consideration, have been placed at my disposal from the commencement of my advocacy of the introduction into India, of those vast benefits which are enjoyed to so full an extent in all countries to which railways have been permitted to extend their influence, and although I am prevented from availing myself to an extent proportioned to their value of these documents in the present brief report, I shall hope, hereafter, to embody such portions as are now necessarily omitted in a future memoir, when the more detailed statements respecting the Indian coal fields are published. Obligations to several parties who have furnished information. Report too short to make use of all documents. Remainder to be given in a future paper.

More full ex- 13. I have extracted more largely from the valuable documents
tracts made furnished by Colonel I. R. Ouseley (now the political agent at
from papers of Chota Nagpore, and formerly engaged for a period of upwards
Colonel Ouse- of fifteen years in the valley of the Nerbudda) as well as from
ley, and Dr. I. those supplied by Dr. J. M'Clelland, the active and indefatigable
M'Clelland to member of the Coal Committee, than I should otherwise have
show the im- done in the present report, on account of the local information
portance of the enquiry and the feeling which exists on
the subject. the subject.

Of the details
of the papers
just referred to,
future mention
will be made.

the most conclusive evidence of the existence throughout India, of remarkably rich mineral resources—as well as of the zeal and earnestness which characterise the disinterested exertions of some of the most intelligent and well-informed men who have devoted the leisure allowed them from their other engagements and duties, in the pursuit and promotion of the best interests of the country.*

Of the expediency of the suggested improvements in the Nerbudda Valley, of their practicability, and of the calculations which appear in Dr. M'Clelland's communication, I shall have occasion to make especial mention hereafter in treating of the branch lines of railway, which, upon the completion of the main trunk line from Calcutta to Mirzapore, it may be deemed advisable to undertake for the sake of the collateral traffic, which they are calculated to bring to the principal line, to the execution of which alone it is desired to direct public attention in the present instance.

Brief retro-
spect of facts
contained in the
annexed docu-
ments.

14. From the accompanying documents it appears, that the imports and exports of Calcutta amount to £16,570,000 in one year, of which the chief portion has been received from or is conveyed into the interior;

Trade of Cal-
cutta.

Traffic past
Jungypore toll.

That the traffic which passed the Jungypore toll on the Bhagurettee River, in one year amounted to 83,493 tons down, and 95,373 tons up the river, and of passengers 31,950 down, and 26,428 upwards, and that the opium has not been included in the former calculation;

Traffic via
Soonderbunds.

That the traffic by the Soonderbunds (of which a sketch is given showing the present circuitous route adopted during nine months, as the trade via Bhagurettee can only be carried on during three months of the year, except by vessels drawing less than eighteen inches draft of water) is in excess of the above;

Traffic across
the Annabad
bridge.

That the traffic by land over the Annabad Bridge in the year 1837-8, also taken from official documents, amounted to 7,742 carriages of all descriptions—108,694 loaded bullocks and other cattle, 33,180 passengers in various conveyances, and 435,242 foot passengers;

* It has been since deemed advisable to defer the publication of these and several of the other papers referred to, on account of the great length to which they extend.

That on the Allahabad and Cawnpore road, to which it is intended hereafter to continue the lines, the year's traffic amounted

Traffic along Cawnpore and Allahabad road.

107,613 hackeries, or carts, 172,377 camels, bullocks, &c., and to 63,720 coolies, employed in the transport of goods and merchandize—and 38,619 carriages of various descriptions, 122,751 horses, camels, &c., engaged for conveyance of travellers, and 266,052 foot passengers;

That the sugar alone which passed the North West Frontier on its way to Calcutta, in the first six months of 1842 amounted to 64,507 tons;

Half-year's produce of sugar in N. W. provinces.

That of upwards of 18,000,000 acres in the North West provinces under cultivation, there are 577,035 acres of sugar cane;

Land under sugar cultivation in N. W. provinces.

That between Hoogly and Burdwan the traffic taken for a consecutive period of nineteen months amounted for one year (1843) to 73,000 foot passengers; 25,080 loaded hackeries; 17,155 empty returning hackeries; 64,415 loaded bullocks, and 339 Government Daks;

Traffic between Hoogly and Burdwan.

That the trade between Burdwan and Calcutta in salt alone amounted in one year to 12,962 tons, and in sugar and goor to 18,518 tons, of which three-fifths are sent by land and water, and two-fifths by land, at a cost elsewhere referred to, and estimated at about three-pence per ton per mile;

Sugar, goor, and salt trade between Burdwan and Calcutta.

That the transport of merchandize between Calcutta and Mirzapore averages by water 47s. 6d. per ton, and by land £10 16s. to £13 10s. per ton, the former occupying an average of six weeks, the latter seven weeks, in the transit;

Present cost of transport.

And that the estimated traffic, at a moderate calculation made by an experienced officer in the service, who has furnished the most recent and carefully collated details of the trade between Calcutta and Burdwan, will amount to upwards of 107,310 tons a year upon the existing traffic, exclusive of passengers.

Average cost of transport of goods between Calcutta and Mirzapore

The above are a few of the principal points contained in the documents which accompany this paper, and which are given in such full and complete detail as to entitle them to a careful perusal.

Estimated existing goods traffic between Calcutta and Burdwan.

The most implicit reliance may be placed upon the whole of these documents, as having been supplied by disinterested and unprejudiced parties, and principally under the instructions, and by the permission of, the Earl of Auckland, who, while Governor-General of India, afforded the requisite facilities for the purpose of obtaining this information, through the officers of, and others employed under, the Government.

Reliance to be placed on documents as being official and supported by confirmatory evidence.

15. The levels of those portions of the line which have been already ascertained, show a gradual inclination of twenty-four inches in the mile, from Howrah, on the banks of the Hoogly, opposite to Calcutta, at which the railway would commence, to the Burdwan Collieries, to which it is proposed to extend the first line at once. Upon this portion of the entire line the

Information received from disinterested parties and authentic sources.

Surveys and levels already taken show inclination for first 140 miles of 12 inches per mile.

£8,000 per mile enough for this portion of the line. expense will not exceed **£8,000** per mile, or **£840,000** for its completion, upon which the gross returns of the ascertained existing traffic in goods alone, exclusive of passengers, troops, the mails, or Government stores, will be **£125,100** a year, without calculating upon that increase which invariably follows the providing of improved and additional facilities for communication.

Intimation conveyed of intention on part Government to grant all the support in their power.

16. I may add that upon intimating my expectation that the undertaking would be carried out at an early period, when I should probably return to India to arrange with the Government the conditions and terms in detail of the Act of Incorporation, as well as to agree, on the part of the Company, to the points which, for the interests of the public, would require such previous arrangement, I received, in addition to the expression of approval which was conveyed in the publication of the correspondence which had taken place on the subject, the most satisfactory intimation and assurances of the favourable disposition of the Government, and of their intention to extend the fullest support and assistance which it is in their power to give to the Company.

Reference to the Reports of the Railway Deputation the Board of Trade.

17. An important consideration, to which I need not here do more than briefly refer, but the determination of which will be of much facilitated by reference to the valuable information contained in the several reports and other documents in the possession of the Railway department of the Board of Trade, consists in the special arrangements and conditions which are entered into between the Government of Bengal and the Railway Company, and which, with the advantage of that experience, which in England has been purchased at so heavy, although perhaps unavoidable a cost, may, by being at this early period adequately provided for, prevent future questions being raised upon points of doubt or uncertainty, and effectually provide for any prospective alterations which the wants or interests of the public or the Government may appear to demand, without compromising private property or personal convenience.

Satisfactory working of Board, and corresponding system recommended for India.

The results, so satisfactory in all respects, which have attended the nomination of the Railway department of the Board of Trade—the impartial, and, in general, able manner in which the duties have been performed, and the beneficial effect it has had, in diminishing the number of accidents and otherwise, are such as to induce a decided impression in favor of the adoption of a similar course in India for carrying out the principle laid down and approved of, in the correspondence with the Government of Bengal, that the Government should afford to the Shareholders and the public, as well as for their own interests, the protection and security which are obtained in England by the means adverted to of placing the Railways to a certain and clearly defined extent, under the control of a superintending Committee or Board of independent and thoroughly qualified persons.

18. The several points connected with the engineering details of the undertaking, will not, in the present Report, require to be more particularly referred to, than to mention that they have been most carefully investigated, and will be available when the time shall arrive for the consideration of active and practical operations.

The whole of the documents, plans, levels, &c., have been placed in the hands of one of the most eminent English engineers (Charles Vignoles, Esq.), whose attention has been, for some years past, directed to this important subject, and whose opinion will be found annexed, in regard to the sufficiency for every useful purpose of the information which has been submitted, to enable him to express his decided as well as unqualified and favorable opinion of the undertaking.

Mr. Vignoles had been some time since professionally consulted by other parties, upon the best means of carrying out such a measure, at which period he contemplated proceeding to India for that purpose, which circumstance, in addition to the nature and extent of his inquiries upon that and subsequent occasions, as well as on account of his high professional character and reputation, induced the early application being made to him, and will, for the same reason, give additional weight and value to the opinion he has expressed.

19. In conclusion, I may mention that, having travelled over and examined a considerable number of the European, as well as American lines of railway, I have no hesitation in stating that the amount of existing, as well as of the certain prospective traffic in goods and passengers, through several of the principal districts, with the facilities which the country affords for the economical construction of railways, are calculated to render such an undertaking one of the most remunerative, and extensively beneficial of any similar work, with which I am acquainted.

Engineering details collected and ready when required.

Documents, plans, &c. submitted to C. Vignoles, Esq., who had reported favourably.

Subject formerly brought to Mr. Vignoles' notice—reasons for desiring his opinion in preference to others.

Result of investigation of Indian as compared with European and American lines of railroad.

That for the reasons assigned, the undertaking would prove of the greatest advantage.

R. MACDONALD STEPHENSON.

RAILWAY CORRESPONDENCE.

2.

EXTRACT FROM THE GOVERNMENT GAZETTE.

NOTIFICATION.

Fort William, 24th August, 1844.

The Deputy Governor of Bengal deeming the establishment of railroads throughout the Presidency of Fort William an object of great public importance, is pleased to publish the following correspondence for general information.

TO FREDK. JAMES HALLIDAY, ESQ., &c. &c. &c.

5, Wellesley-place, Calcutta, July 15th, 1844.

Sir—I have the honor to address you upon a subject to which your earliest convenient consideration is especially requested.

2. The project of establishing railroads in this country has not been entirely disregarded, notwithstanding the impression on the part of many who, not being aware of the circumstances which constitute the practical recommendations or objections to them, entertain an idea that their introduction into India, at present, would be premature.

3. The consideration of the practicability of laying down a line of railway, of the advantages which would attend it to the Government equally with the public, and of the particular lines which would yield the greatest returns, and would in other respects be the most eligible, have for some time past engaged the attention of several parties, both in this country and in England, and it is to the result of this enquiry I would beg to direct your attention.

4. That the subject is one of paramount importance to the best interests of the country, and calculated in a military as well as a commercial point of view to be productive of the most beneficial results, it will, I apprehend, be unnecessary for me to demonstrate. The advantages which have attended their introduction throughout Europe, and in the United States, will be admitted as sufficiently conclusive on this point.

5. Without trespassing unnecessarily upon your time, I shall briefly state the object of my present application, which is to ascertain to what extent the co-operation and support of the Government will be granted, in the event of one or more lines of railway being undertaken by private capitalists.

6. To prevent misunderstanding in regard to the nature of the assistance which is expected of the Government, I beg to observe that no pecuniary aid is required.

7. I have only to request the favor of your stating, whether the Government will, in the event of a Company being formed for this purpose, grant the following concessions :—

1. The ground required for the Railway, which can be conceded under the powers vested in the Government, for the purpose of making and improving roads, &c., whereby all disputes with the proprietors of the land along the lines will be avoided, and the expense of litigation prevented.
2. A Charter or Act of Incorporation under the usual provisions and conditions.
3. That the Government will appoint a proportion of the Directors, in order to secure the due performance of conditions in which the Government is interested.

8. The line upon which it is intended to commence operations has not been definitively determined, as it is dependent upon the amount of capital which can be raised at once in London for the purpose. As, however, it cannot signify to the Government (who must derive considerable benefit from the measure under any circumstances), which line may be first completed, it will probably be unnecessary to do more than to state, that upon receiving your reply to the foregoing requisition, namely, whether the Government, in the event of a Company being formed in London, or elsewhere, of unexceptionable respectability, and with sufficient capital to accomplish their objects, will give their support to the extent specified, arrangements will be immediately made for active operations; and in the course of a few months, I shall be prepared to submit for the approval of the Government the complete details of the undertaking, which only requires the intimation of their general approval, and promise of encouragement, to enable those parties who have already made considerable progress in the matter, by the collection of statistical data, and otherwise, to complete their arrangements, and bring the subject before the public.

10. The necessity for previously ascertaining the disposition and wishes of the Government, and of receiving a promise of support under the conditions referred to, will be apparent upon reference to the failure, from whatever cause, of so many of the undertakings which have been placed under the exclusive management of a Calcutta Board of Directors, and without which support, the parties whom I represent would be unwilling to recommend the undertaking, or take any part in it themselves.

11. With the conditional assurance which alone is required, they entertain little doubt of being enabled to carry through what they will then be prepared to undertake, to the full and entire satisfaction of the Government, as well as to the great advantage and extension of the commerce and trade of the country.

I have, &c.,

(Signed) R. MACDONALD STEPHENSON.

TO FREDK. JAMES HALLIDAY, Esq., &c. &c. &c.

5, Wellesley Place, Calcutta, July 20, 1844.

Sir,—With reference to my former communication of the 15th instant, upon the subject of laying down one or more miles of railway in India, I beg leave to qualify the paragraph No. 7, which specifies the nature and extent of encourage-

ment required by the Government, and in lieu of soliciting that the ground for the railway be given to the Company by the Government, I have to request that a Charter or Act of Incorporation may be granted, with powers to purchase the land required by the Company, for public objects, under the regulation in force for that purpose (No. 1 of 1824).

2. I beg further to state that in requesting the Government to nominate a proportion of the Directors, the object in view would be equally accomplished, whether the Government adopt this course, or by their appointment of a superintending Committee to approve and sanction, on behalf of the Government, the proceedings of the Board of Directors, the Committee being invested with such powers as the legal advisers of the Government may suggest. I have, &c.,

(Signed) R. MACDONALD STEPHENSON.

No. 652.

To R. M. STEPHENSON, Esq.,

Sir,—I am directed by the Honourable the Deputy Governor of Bengal to acknowledge the receipt of your letters, dated the 15th and 20th ultimo, and in reply to inform you that in the present state of the law it would not be in his power to authorize a Rail Road Company to treat for the purchase of land, as for a public object, under Regulation I. of 1824; but he would have no objection, in the event of the formation of a Company with sufficient capital to accomplish this object in view, to apply to the Legislature to make the provisions of that enactment applicable to such purposes.

2. In regard to a Charter, or Act of Incorporation, His Honor would likewise feel no hesitation in recommending, in favor of a well-constituted Company, that the same should be granted under the usual provisions and conditions; and in respect to the appointment of a Superintending Committee, Government will, of course, make arrangements through the medium of its own officers, both for the furtherance of the undertaking as far as may be consistent with a due regard for the rights and interests of the different parties concerned, and for the safety of the community at large.

3. The Deputy Governor desires me to add that he is deeply sensible of the advantages to be gained by the construction of Rail Roads along the principal lines of communication throughout the country, and is anxious to afford to any well considered project for that purpose, his utmost support.

I have, &c.,

(Signed) C. BEADON, Under-Secretary to the Government of Bengal
Fort William, 8th August, 1844.

By order of the Honourable the Deputy Governor of Bengal,

FRED. JAS. HALLIDAY, Secretary to the Government of Bengal.

3.

The following is a copy of the letter addressed to several of the principal mercantile houses in Calcutta, whose replies are annexed:—

Calcutta, 15th August, 1844.

Dear Sirs,—The subject of Railway Communication in India has, for some time past, occupied a considerable share of public attention; and, as the first practica

measures for their introduction into this Presidency have been already taken, and are about to be followed up by the establishment in London of a Company for the purpose, I am desirous to ascertain from the principal mercantile houses, their opinion of such an undertaking in a commercial point of view. I shall also esteem it a favour, if you have given the subject any previous consideration, if you will give me your opinion of the advantages which are likely to attend such an undertaking, provided it be placed under due and efficient control and good management, and, whether you would consider it, under such circumstances, as an eligible investment for capital.

It will be unnecessary for me to point out to you the grounds upon which I request your reply to these inquiries, as fully as your convenience will admit of; as you are aware, that to allow of a right judgment being formed by impartial and unprejudiced persons, it is essential to obtain the opinions and views of all parties whose acquaintance with the various branches of the subject, when taken collectively, can best ensure the attainment of sound and correct conclusions.

I have thought it advisable to ascertain from the Government of Bengal, whether the necessary facilities would be given for the acquisition of the land forming the line of operations in the proposed Railways; and, I am happy to say, that the answer on this subject is most satisfactory, and that His Honor, the Deputy Governor, expresses a cordial interest in the matter.

In regard to the importance in a military point of view, and to the practicability of the undertaking, the several communications of the chief engineer officers of the Government are equally decided and conclusive.

To the commercial benefits which may be expected to attend it, and to the probable advantages as a means of investment for capital, the opinion of experienced commercial houses is now required.

If you desire to examine any of the documents above referred to, I shall have great pleasure in submitting them, and I feel assured that you will not disregard or cursorily reply to this application, when you consider the great national importance of such undertakings to this country, and the results which must follow both to the community of India, and to a very large class in England, from the impulse and extension which will necessarily be imparted to the commerce and trade between the two countries. Awaiting your reply, I am, dear Sirs, yours very faithfully,

R. MACDONALD STEPHENSON.

4.

FROM MESSRS. COLVIN, AINSLIE, COWIE & CO.

Calcutta, 24th August, 1844.

Dear Sir—We are favoured with your letter of the 15th instant, asking us to state our views of the advantages of a railway hence to Mirzapore.

1st. As it is likely to affect the prosperity of the country; and, 2ndly, as to its being a good investment for capital.

Without entering into the mercantile merits of the question of whether such a scheme will or will not pay, depending as it does on the cost of completing and working the line, and the probable return in traffic, data in estimating which has not been furnished to us, we have the pleasure, in reply, to say that in our opinion such an undertaking would promote in the highest degree the best interests of this country, in which the consumer of Indian produce would largely participate; while for the labour of the British manufacturer it would ultimately create a demand, which the expectations of the most sanguine could hardly exceed.

With regard to the undertaking as an investment, we are not, as we have said, yet in a position to judge; but thus far we may venture to state, that the traffic between Mirzapore and Calcutta is so great, the price of land and labour in this country so cheap, the great proportion of the contemplated line of road so level, while we have no parliamentary expenses to encounter, we see no reason why, with prudent management, this intended line should prove an exception to railways generally, and if successful, it will have the advantage to the Indian capitalist of being a permanent and improving investment, not liable to the fluctuations and hazards of mercantile speculations.

We are, dear Sir, yours faithfully,

COLVIN, AINSLIE, COWIE AND Co.

R. Macdonald Stephenson, Esq.

5.

FROM G. ASHBURNER, ESQ. (MESSRS. MACINTYRE AND Co.)

Calcutta, 2nd September, 1844.

Dear Sir,—I take the liberty of replying to your letter on the introduction of Railways in India, as the subject is foreign to the business of the firm; and I can only, therefore, give you my views regarding it as an individual.

With this explanation I have no hesitation in stating that my observations on the Railways of Belgium and the United States, some years since, created a strong impression on my mind that the internal trade of Bengal offered great advantages for the introduction of such works, and the very careful inquiries which I have since made have removed all doubts on the subject:—

The two points for consideration are.

1st. Whether a Railway in this country, if judiciously constructed and well-managed, would pay sufficiently to make it a desirable investment for capital.

2nd. Whether such a work could be constructed and managed subsequently, so as to secure the confidence of capitalists in it as a safe investment for private property.

As regards the first point, it will be sufficient to refer to the official returns I have given of the traffic by land and by water, along the valley of the Ganges.

You will observe that, at present, notwithstanding the difficulty and delay of land carriage, from 10,000 to 22,000 tons of merchandize pass along the military road. It has been ascertained that the expense of this conveyance by land is equal to between threepence and fourpence per ton per mile.

By water the official returns from the Jungypore toll-house show that 181,000 tons of merchandize pass annually between Calcutta and Benares, and the districts above that point.

The expense of the river route, including insurance and interest during the time occupied in transit, amounts to about twopence per ton per mile on goods of the value of £40 per ton, or somewhat more than the minimum charge on a Railway.

It appears also that 435,000 foot passengers pass annually along the military road, and between 30,000 and 40,000 by conveyances of various kinds.

By the river route the number of passengers in 1840—41 was 58,378, occupying 14,591 boats.

These returns show a larger traffic, and a greater number of passengers, than were to be found on any of the great thoroughfares of Europe, previous to the introduction of Railways; and the inference, therefore, without going into

details which are beyond my present limits, is, that such works would answer better there than they have elsewhere, especially if they can be constructed as I believe for £5,000 per mile, instead of from three to four times that sum, as in Europe.

I am satisfied, indeed, after very careful inquiry and minute attention to the subject that no country in the world has ever offered so tempting a field for the investment of capital in Railways as the valley of the Ganges, from one extremity to the other.

The physical impediments are much less than those upon the line of any large Railways I have ever examined.

The only serious difficulty I foresee, therefore, in the prosecution of a plan for the introduction of such works in Bengal, is the organization of a system of management which shall secure public confidence, not only at the commencement and during the construction of the work, but subsequently.

Joint Stock Companies, under private management, have almost invariably failed, from one cause or another, in this country; and I do not think I am wrong in stating that, however well they may succeed elsewhere, they are looked upon here as ill adapted to our present state of society; which, from undergoing great and rapid changes, does not possess materials for checking the abuses to which monied institutions are so liable.

A somewhat similar difficulty exists on the continent of Europe, and the extraordinary delay attending the construction of Railways in France, and other European states, is, I believe, principally attributable to it.

Were this consideration overlooked, and English ideas and precedents taken as a guide for public works here, the result, I fear, would, sooner or later, prove disastrous; but should Government ever become alive to the incalculable commercial and military advantages attending the investment of capital upon Railways, and following the example of the larger continental states, be disposed to patronize such undertakings in the manner requisite, I am confident a system of management might be framed, which would afford the desirable security, and render the returns derivable from them a matter of certainty.

I remain, Dear Sir, yours faithfully,

R. Macdonald Stephenson, Esq.

G. ASHBURNER.

6.

FROM MESSRS. GILLANDERS, ARBUTHNOT & CO.

Calcutta, 27th August, 1844.

Dear Sir,—We beg to acknowledge the receipt of your letter of the 15th inst. expressing your desire for an opinion from us, in a commercial point of view, upon several points connected with the introduction of the Railway system into this Presidency, and we readily comply with your request, although our remarks must necessarily be general, as your communication is of that tenor.

We are all interested in the encouragement of measures tending to improve and develop the resources of this country, and, looking at the question in the abstract, we must express ourselves favourably disposed to the railway system; but as you have not in your letter pointed at any particular line of road, we are unable to give such a decided answer to your enquiries as we should wish, and as perhaps, you might expect.

There have been, as you are aware, several propositions made in London already,

by parties whose knowledge of the subject was manifestly deficient, to construct a line of railway from Calcutta to Diamond Harbor, and to Saugor. But we presume you have some object in view calculated to improve the communication between points at present defective. The single proposition to solve, in our view, is this:—Do the necessities of the country require a Railway to be made between any particular points, to connect any important marts, or to avoid any existing difficulties of transit? We take it for granted; and your knowledge of the plans of the Inland Steam Company will enable you to judge if we are correct or not in an impression that a Railway can scarcely compete successfully with properly constructed steamers, plying upon the river from this to Allahabad; but perhaps a concentration of traffic at Rajmahal may be sufficient to make a line of railway pay from that station to Calcutta; and it will assist in the settlement of this important point if you can afford, for the information of the Company which it is proposed to raise in London, an idea of the traffic to and from Rajmahal, or any places having similar or greater advantages.

The distance is about 200 miles, and the moderate cost of transport by railway, at the rate which obtains upon some of the lines in England, where coal and heavy goods are the great traffic, say one penny per ton per mile, may be reasonably expected to withdraw a portion of the freight of country produce, the which now comes by the river. The distance to Mirzapore is 460 miles by Dawk, and at the same rate the cost of conveyance may be taken on the maund of 1-30th of a ton, at ten annas, a sum that many people would prefer paying, to avoid the risks of river navigation as at present conducted. A line of road suggests itself to these places as giving the best means of trying the system in this Presidency, but we cannot, of course, venture to offer an opinion upon the practicability or expense of crossing, at all seasons, without loss of time, the various large nullahs and ravines which intersect the course which may be taken. Upon these points we hope that you will take full information with you—and the Company's engineers can, we suppose afford it—for we think that, after the experience which has been gained in England respecting the cost of railway works, it will be advisable to possess full information upon all the points which will be canvassed by those likely to assist the important, and, we may add, very desirable object you have in view.

Your letter refers to the question of the introduction of railways so generally, that we can scarcely do more than express our sincere hope that in any line of communication which is selected, in beginning the experiment in this country, you may have it in your power to prove the probability of success attending the execution of it. The best route of communication with Bombay, if you have that in view, will have to be determined upon after full consideration of the benefit to be derived from adopting a course not altogether direct, but which, by some deviation, will bring the great marts that occur intermediately along the course of the Ganges, to aid the working of a line which, throughout some portion of its length, must be, we apprehend, unproductive.

We shall be happy if you succeed in the introduction of Railways into India, with a fair prospect of profit and advantage—for quick and cheap communication between the out ports and the markets of consumption would be attended with great benefit to the manufacturers of England also, who find in this country a very considerable outlet for their productions.

Upon the advantages which may follow an investment of capital in them, we cannot venture an opinion; the information you may collect will enable you, however, to give parties an opportunity of forming one. We remain, dear sir, your faithful, obedient servants,

R. Macdonald Stephenson, Esq.

GILLANDERS, ARBUTHNOT & Co.

7.

FROM W. W. KETTLEWELL, Esq. (MESSRS. LEACH, KETTLEWELL AND CO.)

Calcutta, 28th August, 1844.

Sir,—In reply to your letter of the 15th instant addressed to my firm, I have not given the construction and working of Railroads generally any very careful attention, nor had I otherwise than cursorily considered the probability of any line from Calcutta answering as an investment for capital, previously to the receipt your letter.

As to the facilities and inducements Bengal offers for the construction of a Railroad, my ideas are consequently crude, and may be erroneous; but from the level nature of the country of Lower Bengal, the extremely low price of land, of such labour as would be required, and of wood for sleepers, I should imagine the cost per mile, through a considerable portion of the line which appears to offer the greatest inducement, would scarcely (even calculating on the additional cost of rails) exceed that of the cheapest line in any country into which Railroads have been introduced.

A line from Calcutta should, I consider, provided there be no natural impediments, touch the coal districts, and be carried on to Mirzapore—the great mart for Bengal raw cotton, British cotton goods, woollens, metals, and—more recently—for twist; and from, or through which the countries to the north, east, and for a considerable distance to the west, are chiefly supplied with goods. It is the centre of the great sugar-growing districts, and has several saltpetre, lac dye, and shell lac factories.

Of the importance of our import trade, and of its rapid increase, as well as of that of our exports, Wilkinson's demi-official Book will afford you good tabular information. Of yarn and cotton goods, you will perceive the import has more than doubled itself during the last three years, and from the improving condition of the people of India, and of their growing taste for British manufactures, it is not improbable that the consumption will have been again doubled, ere four years elapse. To Mirzapore, and through Mirzapore to the north, a large proportion of the metals, probably three-fourths of all the woollens, and at least two-thirds of the aggregate of the cotton goods and yarn imported now pass. And as the inhabitants to the south of it are already generally consumers of British goods, it is to the north I look mainly for taking off the great increase of imports, on which I calculate, and for the transit of which the railroad to Mirzapore would afford facilities.

You are doubtless aware that the great season for the transit of goods to, and of produce from the north, is at present from July to the end of November, the navigation of the rivers during the other seven months of the year being so tedious and expensive as to preclude parties making extensive missions during them. Of the average cost of transit of goods to, and produce from Mirzapore, you will doubtless have informed yourself correctly, as well as of the high rate of insurance against river-risk charged by the different European and native offices, which the more prudent, who are the majority, pay.

The tonnage in up-country steamers is generally so inadequate to the requirements of shippers, that the present high rates paid would, for your purpose, give too exaggerated an idea of the importance parties attach to comparative security and despatch; still they will furnish some slight idea.

That a very large proportion of the imported goods now sent to—and of the cotton, sugar, saltpetre, lac dye, and shell lac, &c., received from Mirzapore, would go by such a Railroad as I contemplate, I have little doubt, provided the cost of transit, all advantages being duly weighed, were not too heavy, and I think

it probably would not, when I consider the superior condition in which goods, and especially produce, would arrive; the saving of river freight, of the high rate of insurance, of time in actual transit, and of capital by the diminished necessity of holding back produce, and forming large stocks at particular seasons, especially in a country where the rate of interest is so high as prevails here. Early in the season the best sugar is now sent in small boats at a high cost, and generally arrives more or less damaged; this, I imagine, would all come by rail.

A branch line to Patna would not only take off a considerable quantity of imported goods, but would probably bring back a large proportion of the opium, saltpetre, hides, tallow, and other produce we get from thence.

Of the rates of freight on specie sent by steamer, and of the amount carried to Mirzapore during the last year, you are no doubt informed. From the very high discount at which bills on Calcutta are sold at Mirzapore during the contract and early shipping season for sugar, I imagine a large amount of rupees would pass by the railroad, especially as the transit would be so much more rapid and secure than by steamers.

I am not aware how far railroads on the continent of Europe, America, or in England, depending mainly on the carriage of bulky articles have been found to answer. But to this source, and the conveyance of Government stores, a railroad hence to Mirzapore would have to look for its pecuniary success in a very great degree. Beyond troops, the passengers would, I feel assured, be extremely few, compared with those by railroads of which I have any knowledge, even though extra facilities should materially lessen the disinclination Indians have for journeys not rendered unavoidable.

That such a railroad as I have suggested would be extremely beneficial to this country, and to those connected with its commerce I have no doubt; its success as an investment for capital, I consider to be dependent on the facilities, assistance, and superintendence Government would afford; the absence of any such natural or other obstacles on the line as could not at a moderate cost be overcome; the rate of carriage for heavy or bulky goods, to which it would mainly have to look, being, under the circumstances previously stated, afforded sufficiently reasonable to draw the bulk of what now go by river and land carriage, its projectors looking to passengers as a minor consideration; and last, though not least, to its being begun and carried on free from jobbing, economy being the interest and object of those employed in its construction and working. I am, Sir, your most obedient servant,

R. Macdonald Stephenson, Esq.

W. WILDMAN KETTLEWELL.

S.

FROM MESSRS. LIVINGSTON, SYERS AND CO.

Calcutta, 28th August, 1844.

Dear Sir—We are favoured with your letter of the 15th instant, on the subject of railway communication in India. We have not given this subject more than a passing consideration, and are only prepared to offer a general opinion upon it. There is little doubt that a well-organised line to the larger stations, conducted on principles of strict economy, and freed from the jobbery which has generally attended most of the undertakings in this country, would be a great national benefit. We are not so sanguine of the advantages to be obtained in a mercantile point of view till the lines had created an independent employment for themselves, which, in a country possessed of resources like India, they might naturally be expected to do in a few years.

E

In a military point of view there is no question of the advantages that would attend a railroad, the Government would of course reap the chief benefit and through it the community at large, taking the revenue derivable from this source into consideration, and there is no reason why it should not be calculated on.

We are inclined to believe that railways laid along the principal lines of communication between the stations throughout the country would, at least, be a safe mode of investing a capital from the first.

Confessing our inexperience in matters of this nature, we should feel diffidence in acting on a Committee of management, and would, therefore, beg to decline doing so.

We remain, dear Sir, yours very faithfully,

R. Macdonald Stephenson, Esq.

LIVINGSTON, SYERS AND CO.

9.

FROM MESSRS. ALLAN, DEFFELL AND CO.

Calcutta, 31st August, 1844.

Dear Sir—Your favour of the 15th instant, on the subject of railways in India, has had our best consideration.

We have not leisure before your departure to refer and examine the documents you may possess showing the feasibility of constructing railroads in this country, the probable cost, and income to be derived from goods and passengers.

In the absence of such data we can only state, generally, our opinion that the vast intercourse between this city and Mirzapore (the great central mart for our imports and exports) would alone give an immense and valuable traffic to such a road; but we cannot go further in forming an opinion of its eventual success, as an investment, not having seen any documents bearing upon the subject. The great risk of our rivers in our country boats, the length of the voyage, the want of water a great portion of the year, the strength of the currents in the rains, and the periodical monsoons, would all be thrown into the scale in favour of railroads, independent of the incalculable benefits the people of India would derive by a rapid and free intercourse all the year round, uninterrupted by causes which impede inland navigation, even when propelled by steam.

We notice with satisfaction that the Bengal Government have given encouragement to this great undertaking. In a military point of view it would be of vast importance to them, and we feel confident it would give a great impulse to the general trade of the country, leading to increased consumption of British manufactures, and drawing out the latent resources of this almost inexhaustibly fertile country.

We are, dear Sir, yours faithfully,

R. Macdonald Stephenson, Esq.

ALLAN, DEFFELL AND CO.

10.

FROM MESSRS. COCKERELL AND CO.

Calcutta, 30th August, 1844.

Dear Sir—We have to acknowledge the receipt of your letter of the 15th inst., intimating that practical measures have been already taken for the introduction of railway communication into this Presidency, and asking us to give our opinion as to the advantages likely to attend such an undertaking, provided it be placed

under due and efficient control and good management, and whether we could consider it, under such circumstances, as an eligible investment for capital.

Our opinion being asked as to the advantages of railway communication in the abstract, without any particular line being indicated, or any data given, our answers must necessarily be very general. There can be no doubt that, as regards the commercial interests of Bengal, and those of the public, any line of railway will be of advantage, and we believe that there are lines, the advantage of which would be very great. For instance, from Rajmahal to Calcutta certainly, and probably the longer line between Calcutta and Mirzapore.

Whether the capital employed in constructing a railway would be invested eligibly is a point dependent on so many circumstances that an opinion given as to railways in the abstract could never be considered as of any weight, and we shall not, therefore, venture to give one.

We remain, dear Sir, yours faithfully,

R. Macdonald Stephenson, Esq.

COCKERELL AND CO.

11.

FROM C. J. RICHARDS, ESQ. (Messrs. Gisborne and Co.)

Calcutta, 28th August, 1844.

Dear Sir—I take the liberty of answering your letter of the 15th to Gisborne and Co., simply for this reason, that being the only partner at present of the firm in Calcutta, it would be unfair to the absent members, to cloak my ideas under the name of a firm of which I am not only the youngest, but the least known member.

You observe very truly that the subject of railways in India, has for some time occupied a considerable share of public attention, and I am glad to find that the feasibility of their introduction into this country as profitable investments, is likely even to be proved or the reverse, by a Company established in London. Should such a Company be formed as would satisfy me, would carry out any railway planned, I should be willing to act as a member of their Calcutta Committee, and hope the railway might prove profitable.

In reply to your second question, I beg to say that the advantages which would attend the laying down and working of railways in this country, if successful, are, in my opinion, not at present to be estimated, that they would be great there is no doubt, but how great depends on various questions which could be only answered by practical proof of the working of railways. Our distances are very great, and when railways in Europe or the United States of America are tens of miles long, they must here be 100 miles, whereas the passengers here cannot but be in quite the opposite ratio, and we cannot form any idea how much natives would willingly pay for carriage of goods to enable them to save interest of money. Should the railways proposed be well built, well managed, and found not liable in consequence of peculiarities of our seasons to excessive cost in wear and tear of of the rails or machinery, supposing them to be profitable at first, they would in my mind prove an eligible investment of capital, that is, I am of opinion that the traffic on them would increase, and therefore if profitable at first, they should gradually become more so.

With regard to the third paragraph in your letter, by which I understand you invite the opinions of those you address, I have to say that I consider railways here though very tempting to the view, as very doubtful investments, and that

they should be entered on with great caution ; it is true they can *perhaps* be made cheaper than in Europe or even America, the only item decidedly cheaper would be land, labour and iron would be dearer ; the cost of working them and keeping in repair, I should estimate as double ; the receipts from passengers very small, and I suppose it has yet to be shown how far goods alone carried on railways will prove profitable. I am not surprised that you have had every facility rendered you by the Government and military authorities, it costs them nothing, and were a railway laid from here to Allahabad, the saving would be great to them in transport of troops and stores—it is not two years since 100 European troops were lost in the Ganges in a gale, who cost Government, say £10,000, landed in Calcutta. The commercial benefits referred to in your fourth paragraph in my mind are more than doubtful. I do not think railways in India generally can be profitable, and unless they are made so, how can we look for commercial benefits ?

In conclusion, I beg to say that although I have probably not answered your letter in so satisfactory a tone as you might wish, it may have perhaps been caused from want of information on the subject, as none of the papers left with me convey any information respecting the working of railways in this country, or the estimated traffic of goods and passengers, or I may perhaps have been influenced by a feeling of timidity, preferring not to encourage in any way untried schemes of internal improvements in India, rather than to feel responsible for having been the cause of leading parties in England into disastrous investments of capital.

Finally, I merely have to say that I shall be glad to find myself prove a croaker, and remain

Yours faithfully,

R. Macdonald Stephenson, Esq.

C. J. RICHARDS.

12.

TO J. B. HIGGINSON, ESQ., MIRZAPORE.

5, Government Place, Calcutta, 2nd Sept., 1844.

Dear Sir,—The enclosed few introductory lines from my friend Mr. Ainslie will, I hope, excuse my troubling you with an enquiry, which, in consequence of my early departure from India (on the 18th inst.), entails the necessity for requesting your early attention to it.

My object is to obtain the most authentic, full, and recent returns of the quantities and description of freight which passes both upwards and down, through Mirzapore, Benares, or Allahabad, and which, when a line of Railroad is laid down, would probably be conveyed by that means.

Perhaps a few specific inquiries may be the form in which you can most readily supply the answer ; but in addition, I shall hope that you will kindly add such details as may not occur to me, and if you will give me your opinion generally of the measure in a commercial point of view, you will very much oblige me.

I am most anxious for your opinion, and to receive your replies, before I leave, but, in any case, if sent here, it will duly reach me.

I have to apologize for giving you this trouble, but the subject is one of such paramount interest, to commercial men especially, that you must kindly excuse it, and believe me to be,

Dear Sir, yours faithfully,

R. MACDONALD STEPHENSON.

ENQUIRIES.

1. What is the aggregate amount of traffic which passed up—and what quantity down—during the past year (or a recent twelve months) through Benares, Mirzapore and Allahabad?

2. What quantities approximatively of each description of goods and produce?

3. What proportion of the above is transported by land, and what by water?

4. What is the cost of the principal descriptions of stores received from Calcutta for transport to the three places above named, specifying the chief articles, so sent, and the detailed cost of each, for boat-hire, hackery, boatmen, insurance, interest of money, watching, landing, and incidentals?

5. The same detailed reply as regards produce of all kinds which is sent from or through Benares, Mirzapore and Allahabad, by land or by water?

6. What proportion of the aggregate up and down trade would be sent by railway, provided charges are moderate?

7. What increase in the general trade is it probable would attend the increased facilities afforded by a railroad from Calcutta to the three places above named and on which articles of commerce especially?

8. Is it probable that the opportunity of reaching Calcutta in 24 or 30 hours would induce European and Native merchants and dealers to frequently avail themselves of the opportunity afforded, and to what extent each way?

9. What number of persons pass through, leave, or arrive at Benares, Mirzapore and Allahabad in any one year, distinguishing merchants, native dealers, officers, troops and pilgrims?

10. What per centage is added to the prices of commodities generally above the prices in Calcutta, for cost of transports, &c., say beer in Calcutta at six rupees, sells at Allahabad for eight, or an addition of 33½ per cent. Is this correct, and equally applicable to other articles of trade?

11. Is it probable that of the vast numbers of yearly pilgrimages to Gyah, Benares, Allahabad, to the places of native worship above Allahabad, and to that lying to the south of Calcutta, a large proportion of the better class of natives would avail themselves of the railway, provided due and separate accommodation is provided, and their customs are in other respects conformed to?

13.

FROM J. B. HIGGINSON, ESQ., OF MIRZAPORE.

Mirzapore, Sept. 10th, 1844.

Dear Sir,—I have received your letter of 2nd instant, and may be able in the course of another month to reply to it in detail, giving part, at least, of the information you require; but it is not in my power to do so in time to reach you before the date of your departure.

The field for operations is so very large, that I cannot doubt the success of a Railroad between this place and Calcutta, even should it have to contend with greatly improved steam communication by river. The traffic is very great and is yearly increasing, and I fully believe the natives will readily avail themselves of the saving in time and money which such facilities may afford them; indeed, they have shewn this already, by availing largely of the Company's steamers. I have no idea at what cost a Railroad may be constructed from this to Calcutta, but I am quite sure the income from one would afford good interest for a very large outlay.

Yours truly,

J. B. HIGGINSON.

R. Macdonald Stephenson, Esq.

12.

FROM THE BENGAL CHAMBER OF COMMERCE.

Calcutta, Bengal Chamber of Commerce, Sept. 14th, 1844.

" Dear Sir,—I laid before the Chamber of Commerce your letter of 15th ultimo, intimating that the first practical measures for the introduction of Railways into the Presidency have been already taken, and are about to be followed up by the establishment in London of a Company for that purpose, and requesting the opinion of the Chamber of such an undertaking in a commercial point of view—of the advantages which may reasonably be expected to result, and of its eligibility for the investment of capital.

And, in reply, I have to acquaint you that the Chamber considers that, in the abstract, the introduction of well-planned lines of Railway in India would be very advantageous; but that, upon the benefits likely to attend, or the eligibility of an investment of capital in them, the Chamber is not in a position to decide, knowing, as it does, nothing of the lines you contemplate, of the cost, of the expence of working and maintenance, or of the traffic which may be expected to pursue those routes. A close examination of all these particulars, and of the Railway system as applicable to this country, would be necessary, to enable the Chamber to pronounce the specific opinions you desire.

In my communication by this mail to the London East India Association, I am desired to recommend the subject to their consideration, as being one of obvious importance.

I am, dear Sir, yours faithfully,

R. Macdonald Stephenson, Esq.

W. LIMOND, Secretary.

13.

FROM THE CALCUTTA TRADES' ASSOCIATION.

Calcutta Trades' Room, 7th September, 1844.

Dear Sir,—I have the pleasure to acknowledge the receipt of your letter of the 15th ultimo, on the subject of the introduction of Railroads into India, and in which you request the opinion of the Trade Association as to the advantages or otherwise, which they may consider derivable from such an undertaking.

Your letter was duly laid before a Special Committee convened for the purpose on the 2nd inst., and I have now the satisfaction to forward to you a copy of the resolutions which were then recorded on the subject.

I am, dear Sir, yours very faithfully,

H. BURKINYOUNG, Master Trade Association.

R. Macdonald Stephenson, Esq.

" 1st. Resolved, that the Committee are unanimous in their belief that a Railroad upon some eligible line, taking in its course the most important stations up to Mirzapore, cannot fail to realise great advantages to the country, and be the means of developing products and resources that are yet unknown, in addition to the facility that it would give to the transit of merchandize and produce up and down.

" 2nd. Resolved, that the Committee not having before them any information or data to enable them to come to an opinion as to the probable outlay and returns of a Railroad in India, yet, believing that such works may be accomplished at an infinitely less cost than in Great Britain, they are of opinion that a Railroad laid down upon an eligible line terminating at or near Mirzapore, could not fail ultimately

mately to be successful and profitable, when the unlimited amount of agricultural and mineral produce and merchandize that must be in transit between Calcutta and Mirzapore is considered, independent of what may result from the intercourse of passengers, Native and European, throughout a line of such universal importance."

16.

FROM BABOO MUTTY LOLL SEAL.

Calcutta, 26th August, 1844.

Sir,—I have to acknowledge your letter of the 15th inst. touching the introduction of railways into this Presidency, and requesting my opinion as to the probability of their paying a fair return for invested capital.

There can be no doubt the country would be largely benefitted by the introduction of railways. Whether they would pay is a question experience only can answer. My decided opinion, however, is, that lines connecting our great interior marts with this city, could hardly fail to yield a large return on the original outlay.

If an industrious and thriving population, numbering about 100,000,000—a large, active, and daily expanding internal traffic—cheap land and labour, with most of the necessary materials for construction on the spot, at prices equally low—and perfect security for person and property, are elements that will command success, then it is certain that a more promising field than Bengal for the investment of railway capital could not be found.

I speak exclusively in a commercial sense. The military question, so intimately connected with this subject I am unable to offer an opinion upon. The revenue that would arise from the conveyance of troops and stores, however, I should think would be very large.

In fact the more I look at this subject, the more satisfied do I feel that the introduction of a well-organised system of railway communication into Bengal would prove not only highly advantageous to the Presidency itself, but also to the Shareholders, by yielding them a liberal and steady return for their capital.

The above is my deliberate opinion, formed after much careful consideration of the question since the receipt of your letter on the 15th, and if it prove of any service to you I shall be happy.

As to my becoming one of a Local Committee of Management, should the project be carried out, you must excuse me, as I really have not time. I wish it, however, all possible success. Sir, I am your obedient servant,

R. Macdonald Stephenson, Esq.

MUTTY LOLL SEAL.

17.

FROM MESSRS. KELSALL AND GHOSH. (BABOO RAM GHOPAUL GHOSH.)

Calcutta, 14th September, 1844.

Dear Sir,—Circumstances have prevented our acknowledging till now your valued communication of the 15th ultimo.

You wish to receive the opinion of mercantile houses on two points, namely, what commercial benefits may be expected from the establishment of railway communication in India, and how far it is likely to afford an advantageous investment for capital.

The commercial benefits that are likely to arise from the safe and rapid transit of goods and passengers by locomotive power on railways are unquestionable, and we may add almost incalculable. Were we to express our views as fully as we feel upon this subject, we should probably exceed the limits of sober calculation. That it will benefit the country by developing her hidden and partially-opened resources—that it will infuse a spirit of enterprise hitherto unknown to her merchants—and that it will increase the consumption of British and other goods where they are known, and create a demand for them where they are not—are inferences which even the cautious must admit.

In the present state of our information we are unable to reply satisfactorily to your second enquiry, namely, how far the investment is likely to prove profitable. Nor are we aware of the precise extent and nature of the information you have collected. We feel, however, sufficiently disposed to believe that if a judicious line is selected, say hence to Allahabad, in as straight as economy will direct, embracing all important places in its course, say the coal mines near Burdwan, Benares and Mirzapore, with probably a branch to Patna, embracing Gyah; and the business put under efficient and honest management, the chances of profit seem so favourable as to justify us in recommending our friends to contribute to what we deem an important step, namely, the expenses of a minute scientific survey of the proposed line, and of collecting all the statistical information available. This done, the difficulty will be greatly obviated of estimating the first cost of the rails, engines, carriages, &c., as well as the expense of keeping up the works, &c. And as to the returns, commercial men of experience, in combination with intelligent natives, will not be long at a loss to make a fair estimate.

The reasons which induce us to view the project favourably are, on the one hand, the certain cheap cost of railways in this country as compared with Great Britain, owing to various causes too well known to require enumeration; and, on the other hand, the existence of an extensive trade between Calcutta and the Upper Provinces, which is sure to increase with the facilities of railway communication, provided, of course, the charges are reasonable. We would also venture to assert, though we are aware much doubt exists on this point, that passengers will not be wanting. This we deem to be a very important consideration, as we believe the greater number of railways in England derive more profit from this source of their income than from the conveyance of goods. We are aware that the people of this country are generally very poor—that the natives of Bengal are not a travelling people, and that religious prejudices would interfere to some extent to prevent the Hindoos resorting to these conveyances. While we admit that the majority of the people cannot afford to travel in a railway train, we maintain that the number of those who can are by no means small. The social relations between the Lower and Upper Provinces is almost *nil*, but the mercantile relations are extensive and extending; and so far as mercantile pursuits are concerned, the up country people are noted travellers. The relation between the people and the seat of power and government are by no means unimportant. The Government itself, for the conveyance of its mails and troops, would not afford a trifling support. Their servants, to whom time is valuable, would prefer expeditious travelling; the growing class of intelligent natives would freely resort to it; and, lastly, the religious connexion between the Hindoos and the holy cities of Benares, Gyah, Allahabad, and others, would alone fill the trains with hundreds of the better class of pilgrims. This brings us to consider the extent of religious prejudices. As a native of the land, the writer feels some confidence in stating his opinion that he believes they may be overcome by a few simple arrangements. Let there be three divisions of the people, namely, Mahomedans, and high and low caste Hindoos. If any female passengers offer, let them be accommodated in se-

parate carriages. And do not let the travellers be required to make a run of more than twelve hours at a time (which of course would never be necessary). We feel sure with these easily effected arrangements, railway travelling would be generally and eagerly availed of by all classes of men—except, perhaps, by a few, very few old, antiquated Hindoos, who look upon every innovation with feelings of horror. The only serious objection would be on the part of the females; but even this stronghold of native prejudice we hope to see successfully undermined by the civilising influence of steam.

In conclusion, we may observe we feel a lively interest in the success of your great project from a conviction not only of the mighty changes it would tend to produce on the political, social, moral, and religious condition of the millions who inhabit this vast territory under British rule, but partly from an interested motive arising from the certain knowledge that it would increase our own immediate line of business. Extensive imports and sales of British manufactures are now made through our agency in Calcutta, and as a railroad hence to the heart of the Upper Provinces would give us more to import and more to sell, you will see we have a palpable and direct interest in its establishment.

We may add we feel sure our Lancashire friends, who are equally interested with ourselves, would willingly support any feasible project of this nature as soon as they could see in it the elements of success and the prospect of moderate returns.

With our hearty wishes for the success of so great an undertaking,

We remain, dear Sir, yours very faithfully,

R. Macdonald Stephenson, Esq.

KELSALL AND GHOSE.

18.

FROM COLONEL WARREN, C.B., TOWN MAJOR, FORT WILLIAM.

Town Major's Office, 17th September, 1814.

My dear Stephenson—My reply to your enquiry of what my opinion is respecting the advantages of railways in this country can be given in a few words.

There cannot be two opinions upon the subject. For my own part, I regard their introduction as likely to effect such a change throughout the whole country, and to confer such incalculable benefits upon both the Government and the public, that no cost (within reasonable limits) could be too great to accomplish the object.

The importance of the undertaking, in a commercial point of view, I presume to be great, but of this I am unable to give an opinion; but of its advantages, in a military and political point of view, I have no hesitation in stating that the advantages are infinitely beyond what, upon a cursory examination of the subject would be supposed, and would be cheaply purchased at almost any price.

The practicability of receiving intelligence from distant parts of the country in as many hours as at present it requires days, and even weeks, to accomplish, and of sending instructions, with troops and stores, in the same brief period, are considerations which cannot be too highly estimated. Troops could be kept at more distant and healthier stations than at present, and much loss of life from sickness would by this means be spared. Stores would not to the same extent be required at the various depôts, and the loss by decay, and the destruction incidental to the climate which now obtains, would also be avoided.

I can only assure you that no undertaking has ever been brought forward for

the benefit of India which, for the real and substantial benefits to be derived from it by all classes, can at all be compared, in my opinion, to the introduction of railways upon the principal lines of road throughout the country, and I am equally assured that in the early success of your endeavours to introduce them you will have the cordial good wishes, and hearty co-operation of all parties, and certainly of that of

Yours, very truly,

GEORGE WARREN.

19.

FROM CAPT. GOODWYN, GARRISON ENGINEER AND CIVIL ARCHITECT OF
FORT WILLIAM, AND SUPERINTENDANT OF SUSPENSION BRIDGES AND
IRON ROOFING.

Fort William, 12th August, 1844.

My dear Stephenson—I am most happy in complying with your request, not only because I am sure that your enterprise and talent devoted to the Indian railway cause will tend considerably towards the construction of so very desirable an object, but because the subject has occupied my mind for some years past, both in England and in this country, and however much the phantom of "Ill success" may haunt the Indian public, it is only because they have at present but a superficial idea of the spirit of the age, the resources available, and the benefits to be derived. I have gone somewhat deeper into railway matters, and I feel convinced that the time has arrived for the early introduction into this country of this peculiar mode of communication, not only with reference to the capabilities of the country itself, but as calculated to confer greater benefits upon the whole country than I can describe in the limits of a letter, both in a military and political point of view, as well as a commercial. The enormous traffic already existing, and constantly on the increase, the almost incredible number of passengers of all descriptions, who now travel by the tedious and insecure means of hackeries and bullock carriages, and who would most assuredly avail themselves of the security, rapidity, and comparative economy, at which they could be conveyed by railway. The planter and merchant in Central and Upper India, whose goods are now consigned to the dangerous, crazy boats which navigate the rivers, at enormous risk and decided uncertainty of their arrival at their destination in a marketable condition, would hail with joy the means of transporting their indigo and cotton with the certainty of obtaining the price of the day, and the security afforded to the merchandise by the rapidity of the conveyance.

To the Government, in the conveyance of military stores, troops, officers, and mails, the benefits are really so numerous and of such magnitude that the merits of each individual case requires more detail than is here necessary. Suffice it to say that the estimated gains have been entered into, and are enormous, both in a financial and military view, whilst the statistical returns of the number of passengers and of traffic on the line between Calcutta and Allahabad, of which, I believe, you have the particulars, sufficiently confirm what I have advanced on that head.

As regards the practicability of the line, or any line between this city and the limits of our north-western frontier, my opinion has been given at some length before, and I have no hesitation in saying that there is no line of equal length in any other country which affords so great facilities, or so few impediments (and those inconsiderable in an engineering light) to the laying down a railway as the line above referred to, which, I understand, it is the intention of your Company to open.

The distance to Burdwan, the mineral and coal trade of which would of itself be a source of considerable revenue, before the rest of the line is opened (as the coals and rich produce of that district would immediately come by this conveyance), is in a direct line about fifty-six miles almost an uninterrupted level, and which continues for about fifty miles further, and along the whole of that distance there is not a single obstacle worth mentioning, or that would call for expensive operations. From Rāneēgunje to Shergatty the country is less level, and near the latter town, through the Rajmahl range, is the "——" pass, which, with the crossing of the "Soane," constitute really the only engineering portions of the line that will require much consideration.

They are not, however, to be compared with many of the splendid works in Europe, by which more serious obstacles have been overcome, and as long as the "Chat Mass," the "Ouse Viaduct," and the "Box Tunnel," remain records of engineering perseverance, the above-mentioned "pass" and "Soane" are scarcely worthy of comparison. I mention them, however, as requiring more attention than other parts of the line. The remainder is without difficulty worth naming. The trunk road affords an almost perfect level northward, and I have no doubt, from repeated calculations I have made, that at 30,000 rupees or £3,000 per mile, the entire undertaking may be estimated—viz., from Calcutta to Allahabad (and Ferozepoor, if you will so much the more economical in outlay), with a branch to Benares, if only to Allahabad, or to Agra and Meerut—if it is carried the whole length. You may depend on my zealous co-operation in this matter, because, being impressed with the full value of the objects to be attained, I feel that every month as it passes is so much time to be redeemed by railway operations.

With assurances of every kind wish for your success,

Believe me, Yours very sincerely,

R. M. Stephenson, Esq., C.E.

H. GOODWYN.

20.

FROM CAPT. GOODWYN, GARRISON ENGINEER AND CIVIL ARCHITECT
OF FORT WILLIAM.

Fort William, 8th Sept., 1844.

My dear Stephenson,—I have already given my opinion upon the subject; but as it is again requested upon the choice of the line which shall offer the greatest facilities for construction, with the fewest engineering difficulties between Calcutta and Mirzapoor, I have only to add that the more direct course through the Burdwan district and in or near the line of the trunk road, presents, in my opinion, no obstacle which engineering experience cannot grapple with. I have no hesitation in stating that this line is practicable at a moderate cost throughout, taking the very large proportion of almost level land into consideration, and I give it the preference, under the impression that branches leading to the main line will be found more advantageous than the more circuitous route along either bank of the valley of the Ganges.

I presume that one of the first steps taken by the Company will be, after its constitution, to direct the detailed survey of the line to be made, when, in the course of investigation, it will be conclusively ascertained whether any advantages, not at present apparent, may exist to induce a preference of the latter over the former course.

In the present stage of proceedings this can signify but little, as the amount at which the line has been estimated would not, in my opinion, be exceeded in either

case, as the increased expense of carrying the line along the hilly range, upon the direct line, would be an equivalent to the execution of the greater distance in the other case.

The course along the valley of the Ganges is well known to offer scarcely any difficulties, and hardly a deviation from a uniform inclination of a few inches in the mile, along the whole distance of proposed line. Your ultimate survey will, however, determine this as soon as the information can be required. In the mean time you may feel assured upon the opinion of others as well as my own, that both lines are, in an engineering point of view, practicable; and I think that the result of the survey will be the adoption of the direct line, with branches.

There is no doubt but that the rains are of longer duration, and more violent than in Europe, and that somewhat greater care and precautions are necessary to prevent injury by them; but when, as is at present the case, their effects have been experienced and provided against, there can be no ground for apprehension on that head.

Yours sincerely,

H. GOODWYN.

21.

FROM CAPT. GREENE, SECRETARY TO THE MILITARY BOARD.

September 17, 1844.

My dear Stephenson,—You have asked my opinion about the introduction of railroads into this country. In accordance with your wishes, I commenced jotting down such remarks as I thought pertinent to the subject; but the subject is so vast, the field so extensive, the temptation to stray right and left so great, that I really know not, with my limited leisure, when I should say all I thought ought to be said on the subject; and after all, the whole may be said in half-a-dozen lines. I really believe the cost of an extensive line of railway in this country (say from Calcutta to Delhi) would be less than that of any line of which we have any knowledge here. And, secondly, I feel assured that the speculation, as such would be a profitable one; and as regards all local interests, private benefit, and public security and convenience, it would be of inestimable advantage to the country.

Go on and prosper; wishing you health and happiness, and success in your great locomotive "agitation."

Believe me, very sincerely yours,

Sept. 17, 1844.

G. T. GREENE.

22.

FROM CAPT. A. S. WAUGH, SURVEYOR-GENERAL OF INDIA.

August 10th, 1844.

My dear Stephenson,—I have been favoured with your letter requesting my opinion upon the feasibility of a railroad, from Calcutta to the Upper Provinces. This subject has lately given rise to much private discussion, owing, I believe, to several influential mercantile firms seriously contemplating the project, as an important and profitable speculation. My personal knowledge of the tract of country lying between Calcutta and Allahabad, is not sufficiently minute to enable me to give any detailed opinion upon the question, nor do I believe that any one can be found capable of giving a decided opinion, *ex cathedra*. Colonel Forbe, however, is intimately acquainted with a large extent of the country to be tra-

versed, and the officers on the great Benares road, of which public work Captain Willis is superintendent, could give much valuable information. I should, however, imagine that a preliminary survey would be indispensable to a correct view of the subject, and it ought to be conducted by a person conversant with English, and more particularly with American railroads; because the circumstances of the latter country more nearly assimilate to those of India. The expense of such a preliminary survey, might I think, devolve upon the Government; because the state would benefit immensely by the scheme proving successful. It would not be a costly undertaking, as no fine levelling would be necessary; the survey, in fact, would partake more of the character of an exploratory reconnoissance, and the relative levels could be determined with sufficient accuracy by the theodolite. A few minutes more, or less, in the slope of the gradients would be unimportant in discussing the practicability of the railroad, whereas, it would be a matter of the greatest consideration in a canal.

There can be no question that the proposed line, if completed as far as Benares or Allahabad, would be of immense advantage to the Government in a military point of view. It would facilitate and cheapen the transport of stores, and of troops, and would save all the losses in both personal and material, which are annually occurring by the accidents on the river.

It would also be highly beneficial to the best interests of the country by diffusing wealth and intelligence, where all is now poverty and ignorance. The beneficial influence on the native country gentlemen, and upper classes in the provinces, would be of rapid effect, but many years would elapse before the lower classes, such as agricultural labourers, would feel any improvement. The tendency, however, to raise prices in the Upper Provinces, which would follow from the opening of such an outlet for produce, would, in time, ameliorate the condition of all classes, and diffuse wealth generally. When the grand Doab canal comes to be completed, it is clear that in favourable seasons, the markets there will be glutted with agricultural produce. In a mercantile point of view, the two or three months which are now absorbed in the transit of goods to and fro, is a matter of much importance, and a speedier communication is much to be desired for some staples, such as cotton, which are deteriorated by exposure on the road. With regard to passengers, there will doubtless be an immense increase of travellers among the higher and wealthier classes, European and Native; but it will be long before the third-class trains, carrying labourers and artisans, will be brought into requisition. These are, I understand, the most profitable trains in England; but here an artisan would rather walk twenty miles than pay an anna. In fact, labourers generally in the Upper Provinces have to support themselves and families on sums not exceeding three or four rupees per mensem, and their time is of little value. Agriculturists of ten or fifteen rupees per mensem, keep a servant and live like gentlemen. In fact, time is of little value to them, and the little labour performed by all classes is the true proximate cause of Indian poverty, the ultimate cause being the fewness of their wants, and their contented dispositions.

In a general point of view, comparing the immense area of India with its population and revenue it is one of the poorest countries in the world. It appears rich because it is large. This is an unfavourable condition for railroads; because the length of line is out of proportion to the population and wealth. The capabilities of improvement are doubtless very great, and few measures would prove more beneficial than a railroad of the extent proposed, but the question of immediate profit would be affected by the present condition of the country, and not by its state in future.

The benefit to the country generally, and the great advantages which would accrue to the state in a military point of view, might induce the Government to

lend support to the scheme, and without such support it would be impossible to raise the necessary capital, because there is not sufficient local wealth; and, on the other hand, European speculators could not be expected to embark on the scheme without the guarantee of the Government. Unless, however, the whole line were completed, the above-mentioned political benefits would not be obtained, and no assistance could be expected from the state.

For instance, a railroad from Calcutta to the Burdwan coal mines, would doubtless be a very profitable speculation, but the advantages derived therefrom would be entirely local, and confined to certain classes. Consequently, Government in entering into such an undertaking, would not proceed upon the same high political grounds, upon which the question of the long line is based.

Although I am of opinion that a preliminary survey is indispensable to an accurate discussion of the question, still the general knowledge which we have of the tract of country between the commercial capital of Bengal and the upper terminus will be useful in taking a cursory view of the subject. Referring to the map it will be found that the direct distance from Calcutta to Benares is about 388 miles, to Mirzapore about 408, to Allahabad about 456 miles. Of this distance 248 miles are situated in a highland country, rising in one direction to the height of near two thousand feet above the sea. The rocks composing it, are primitive transition and secondary, and with the exception of a small portion of sandstone grit belonging to the coal measure, they are the hardest class of rocks, such as granites, basalt, and greenstone. These are impenetrable, except at vast expense, by means of tunnels, or excavations, and the acclivities are so steep that they cannot be surmounted by railroads. But even if the direct line was not beset by insurmountable obstacles, it would be inexpedient on account of the poverty of the country; which for nearly the whole distance above cited, is a wilderness, diversified at long intervals by a little cultivation, and scarcely animated by human beings. This line would moreover follow the valley of the Damooda for some distance, and would have to cross that river at least twice. Abandoning this line, and moving a little to the eastward, we come to the tract between the Damooda and Adji Rivers, and following the lines of the new road, we pass through Burdwan, and the district of the coal mines. This line undoubtedly offers fewer obstacles than the other; it outflanks the Damooda River, and also the highest levels of the hilly tract. If it be practicable in other respects, it is preferable to any other line that could be proposed. It is very nearly a direct line, and the immediate connection of the coal districts is in itself a great object, I have never travelled upon this route, and cannot therefore offer an opinion, but valuable information could be obtained from the superintendent of the road. The first part of the line through the Hoogly and Burdwan districts is covered with water during the rains, and the road would need to be embanked the whole way to the height of a few feet, but this would not be a costly work, provided the embankment be not made unnecessarily high, which is generally the case in all such undertakings. The first 120 miles therefore presents no obstacles of any consequence. The line then enters the coal districts, which are intersected by numerous dykes, hills, and ranges of primitive formation. Passing along the foot of the Parisnath Mountains (4,483 feet high), the line follows a tract which I imagine is not impracticable, although more or less hilly and rocky, until it reaches the Llanwa Pass, which impediment I suppose might be surmounted by judicious measures. The gradient at this spot would, however, be very steep, and I imagine fixed engines would be indispensable. From Llanwa Pass to Sassaram is 87 miles including the passage of the Son River, a formidable but not insurmountable obstacle. I have never traversed this part of the line, although I have surveyed the country a few miles south of it, and am disposed to consider that there is nothing impracticable. The rest of the line will be comparatively easy work.

In this cursory description, I have not considered the many little torrents and small rivers which cross the line. These are all intersected near their sources, and although expensive difficulties to overcome, they are by no means insurmountable.

Should this line on examination prove impracticable (which I sincerely hope it will not), it will be necessary to bend the line so far east as to outflank the hilly range altogether. In this case it ought to proceed in the direction of Burdwan, and send off a branch to the coal mines. Beyond this point it appears to be advisable to proceed to join the line of Colonel Forbes' proposed Rajmahal Canal, whereby we shall escape the inundations of the lower country further east, and shall also be able to cross the tributaries of the Bhagirattee near their sources.

Arrived near Rajmahal, it is a question whether the line can continue along the right or south bank of the Ganges. The river frequently runs close to the Rajmahal Hills, which are composed of obdurate igneous rocks, and what with these obstructions, and swamps, creeks, and shifting nature of the river, I apprehend great difficulty as far as Monghyr, after which with the exception of the passage of many tributary streams, the work will proceed with comparative facility.

If on examination it should be found impossible to creep along the foot of the Rajmahal and Bhagulpur hills, there is no alternative but to cross the Ganges below Rajmahal, and carry the line through the rich and fertile country on the north bank of the Ganges. This part of the line will present no formidable difficulties, except at the passage of the Ganges, and its principal tributaries, viz., the Gundak, Gogra, and Goomtee, besides many smaller rivers.

You will thus perceive that on a general view of the subject, four different directions may be proposed for the railroad. The first or direct line, is neither practicable nor desirable. The second follows the direction of the grand road, and is the most desirable line to adopt, provided the difficulties which it will have to encounter, can be surmounted. The third or eastern route avoids the hilly region altogether, and adopting the celebrated line of the Rajmahal Canal, selected by Colonel Forbes, proceeds via Bhagulpur, and Monghyr to Mirzapore. This line is doubtless practicable as far as the head of Colonel Forbes' Canal, but it will I apprehend be a formidable, if not insurmountable undertaking, to pass round the flank of the Rajmahal and Bhagulpur Hills. The question can only be settled by an actual survey. The fourth line is identically the same as the former, as far as the head of Forbes Canal, it is then proposed to cross the Ganges, and proceed along the north bank by a route sufficiently inland to be out of the reach of the inundations and capricious encroachments of that river. It is well known that the Ganges is constantly changing its channel, but it may at the same time be remarked, that its wanderings are confined within certain prescribed limits sufficiently well indicated by the ancient banks, which are sometimes as far as eight or nine miles inland. The play ground in which the river meanders is not generally more than nine or ten miles in breadth, and the channel will sometimes be found on one side, and sometimes on the other of this low tract. Whatever may be the laws that regulate its fluctuations, the variations are obviously secular and recurring. The high banks which limit the wanderings of the stream are, of course, more or less furrowed by transverse ravines, and on this account the route to be followed by the rail ought to be three or four miles inland, with respect to the ancient banks.

The fourth route, although most circuitous, is undoubtedly the easiest of construction, being practicable in its whole extent, on gentle gradients, and offering no other difficulties than will be occasioned by the passage of several large rivers, obstacles which, however formidable, and costly to surmount, can, nevertheless be overcome by skilful arrangement.

Until the lines are surveyed, it would be premature to estimate the probable cost of so great an undertaking, and even when all the local data are acquired, a great deal will depend upon the principle of construction adopted. If the American method be pursued of reducing the outlay of capital, to a minimum, by adopting temporary expedients, there is no reason why a railroad should not be constructed as economically in India, as in the new world. The expense ought in fact to be much less here, in proportion to the rate of wages, and the price of materials. By this method of procedure the line would be most speedily opened, and consequently a return for the capital expended would be most quickly obtained.

I am sorry that my account is so meagre, and am apprehensive that you will find no information in it, but what you are already in possession of.

Your's sincerely,

A. S. WAUGH.

23.

TO SAMUEL ASHBURNER, Esq.

5, Government Place, Calcutta, Sept. 2nd, 1844.

Dear Sir,—Understanding that you have been recently, and for a period of several years, engaged upon the construction of Railroads in the United States of America, I am induced to request the favor of your giving me your opinion upon the subject of applying the same means of communication in this country, between which and the United States there appears to exist considerable analogy, in the absence of Parliamentary expenses in securing a Charter, as well as in the cheapness of land, and of materials.

I have the pleasure to enclose a sketch of the line under consideration, and I shall esteem it a favor if you will devote a sufficient portion of your time to examine it, with the accompanying documents, and to inform me, whether you consider that the undertaking can be completed for the amount at which it is estimated, presuming, of course, that no serious obstacles shall appear when the detailed and final survey of the whole line is made. Your opinion of the undertaking generally will also much oblige,

Dear Sir, yours faithfully,

R. MACDONALD STEPHENSON.

24.

FROM SAMUEL ASHBURNER, Esq. CIVIL ENGINEER.

Calcutta, 9th September, 1844.

My Dear Sir—I return with this, the sketch of a line of Railway from Calcutta to Mirzapore, and accompanying documents, you did me the favor to send me on the 7th instant, at the same time, requesting me to inform you whether, upon examination of the papers, I consider the undertaking can be completed at the cost estimated.

With these data only, it would be impossible to arrive at any very accurate estimate for the line under your consideration, as, although a great portion of it is described as level, or nearly so, the number of streams crossed, their velocity,

width, depth, liability to overflow, &c. &c. are not given; and these may constitute very important elements of cost.

Without a section through the hilly district, and description of the cuttings, I would hardly venture an opinion upon the subject, and what I have already remarked, regarding an examination of the smaller streams, is still more applicable to the Soane. Having had, however, at a former time, occasion to make a tolerably careful personal examination of part of this line, together with the information I then obtained concerning the whole of it, enable me to judge to a certain extent as to the sufficiency of your estimate; and, although my impression is, undoubtedly, that it would be very difficult to find elsewhere a route offering so great inducement for the construction of a Railway, as that from this place to Mirzapore and Allahabad, I confess I am a little inclined to doubt the practicability of getting a well built *double* line from this to Mirzapore, with easy gradients, into operation for six thousand (£8,000) per mile. Nevertheless, I would take the liberty of suggesting that a *single* line will, for the present at least, be found to answer every purpose, both for the conveyance of goods and passengers. If so, recollecting the extraordinary facilities for procuring good materials, and the small price of earth-work and masonry in this country, I have no hesitation in giving it as my opinion that the work may be completed in the most approved and desirable manner for something less than the sum named per mile throughout. And, as is likely to be the case upon survey, if a favorable line is found through the hilly district, a large deduction may be made from this amount.

Believe me, my dear Sir, very truly yours,

S. ASHBURNER.

R. Macdonald Stephenson, Esq. 5, Government Place.

P.S. If you can, before the 18th, send me even a rough line of levels over the hilly country, I will with pleasure give you an approximated estimate more in detail.

Yours,

S. A.

25.

FROM LIEUT. C. HANDFIELD, OF THE BUFFS.

Calcutta, September, 9th, 1844.

My dear Stephenson—You request my opinion upon the practicability of laying down a Railway from Calcutta to Mirzapore and Allahabad, at a moderate cost, on account of the facilities afforded by the line of country traversed.

As a commercial speculation I cannot give an opinion, not having any knowledge of these matters. As a military man, having taken troops through that part of the country, and that less than a year ago, I have no hesitation in giving you the result of my impressions; and as I had understood that it is your intention to bring such an undertaking forward, I paid more attention than I should otherwise have done to the subject. As a military measure, the importance of being able to transport troops, stores, &c. has been already so fully evidenced in England, that there can be but one opinion upon the subject. I may say here that from Chinsurah (which you may recollect is about thirty miles from Calcutta) to Allahabad occupied my detachment from the 20th November to the 8th of the following January, and that without any unnecessary delay. As regards the road itself, you are probably aware that the surface of the Great Trunk road is composed of Konka, which, when hard, is of a metallic character, smooth as a

billiard table, and easily travelled over, but sufficient provision does not appear to have been made for carrying off the water. Parts of the road are consequently broken up occasionally from this cause in the rainy season. The levels appear very uniform from Calcutta to Burdwan (no rise being perceptible), and thence to the foot of the Rajmahl hills, where the undulating country commences, and continues in a series of alternate rising and falling for some marches or a distance of say from sixty to eighty miles the road winds through the hills. Of course there are no cuttings, at least none that I saw, and the rise and fall is never so great as to offer any impediment to a hackerie, if properly loaded, or perhaps you will better understand, the most timid European coachman would not have thought it necessary to put on his drag, if driving down any of the descents. I am sorry I cannot speak with more certainty about the distance across those hills, but memory fails me, and I have no document to refer to. It is, however, easily ascertained. From the foot of the hills to the Soane the road is again level, no inclination being perceptible. The Soane is about three miles across. Red sandy, with large stones here and there. Very little water in the dry season. Rocky bed a few miles above, and extensive coal mines a few miles below, when we crossed. From the Soane to Allahabad, and thence to the foot of the Himalayas, no variations of levels are perceptible.

I took particular notice of the country for the reason before given, and am sorry that it was not in my power to take more correct observation of the difference of the levels through the Rajmahl hills. Of this, however, there is no doubt—that the country is a dead level, to all appearance, and I fully believe that seen with an instrument the difference would be hardly perceptible, except only the part through the hills that I have referred to.

Ever, my dear Stephenson, yours very sincerely,

CHARLES HANDFIELD, the Buffs.

26.

EXTRACT FROM A LETTER ADDRESSED TO COLONEL J. R. OUSELEY, BY
SYED ABDOOLLAH.

Benares, 28th August, 1843.

"I have observed in the public prints your opinion as to the propriety of the erection of a Railroad in this country. I am not very well versed in matters of this description, but allow me to add my humble voice in favour of the scheme. If the proposed road is constructed, I consider it will be highly beneficial to the whole of India. I am satisfied that the majority of the influential and intelligent inhabitants of this country, whether Europeans or Natives, will be willing to afford every assistance possible."

27.

COPY OF A LETTER FROM E. WILKINSON, Esq., SUPERVISOR OF
CUSTOMS, &c., &c.

Calcutta, 4th September, 1844.

My dear Sir,—I am truly a well wisher to the contemplated plan of giving us Railroads in this country, and I am therefore particularly sorry that I cannot give you the information you seek.

I have had no experience whatever in the internal trade of the country, and the greatest portion of my life having been passed in Calcutta, I am altogether ignorant as to the natural facilities which may be afforded, or the impediments which may be discovered, in laying down your first line.

I can, however, tell you from official experience, that the bulk of our staple productions is exported, and as a fair estimate of internal transactions in trade may consequently be pretty accurately deduced from our annual exportations, I have much pleasure in sending you three recent volumes of the "External Commerce of Bengal," of which I beg your acceptance. This is the extent, I regret to say, of the assistance I can afford to your praiseworthy efforts.

A reference to some of the principal mercantile houses here, will, no doubt, obtain for you full information on the subject mooted in your note to me.

I remain, my dear Sir, yours faithfully,
R. Macdonald Stephenson, Esq.

E. WILKINSON.

20.

Estimate of Traffic obtained by Bala Muttu Loll Seal, from the principal Mahajuns engaged in the trade.

Estimate of the quantities of the undermentioned Staple Articles of Commerce annually imported into Calcutta from Hindosthan, west of Ghazee pore, for exportation and local consumption, collected from the best informed Mahajuns engaged in the trade.

	Maunds.
Indigo	20,000
Sugar	25,00,000
Saltpetre	6,00,000
Cotton	2,20,000
Wheat	1,50,000
Gram	2,00,000
Dholl and Peas	2,00,000
Oats	50,000
Barley	2,000
Opium	5,600

N.B.—Mirzapore carpets, Cashmere shawls, scarfs, coarse piece goods, and an innumerable variety of other articles, no idea can be formed of the quantity, further than that taken collectively, they must constitute a large miscellaneous import.

Estimate of the quantities of the undermentioned Staple Articles of Commerce annually imported into Calcutta from Hindosthan, east of Ghazee pore and west of Rajmahl, for exportation and local consumption, collected from the best informed Mahajuns engaged in the trade.

	Maunds.
Linseed	2,00,000
Mustard Seed	50,000
Teel Seed	5,000
Wheat	2,00,000
Dholl and Peas	2,50,000
Gram	2,50,000

Opium	12,000
Indigo	70,000
Ghee	5,000

N.B.—Besides the above, there are an innumerable variety of other imports that cannot possibly be estimated, but which constitute a large and valuable trade, yearly increasing.

Calcutta, 1st September, 1844.

29.

EXTRACT FROM A LETTER FROM R. J. CHAMBERS, ESQ., BY DESIRE OF
BABOO MUTTY LOH SEAL, RESPECTING THE TRADE BETWEEN CAL-
CUTTA AND MIRZAPORE.

September 10th, 1844.

"Since I sent in that estimate of imports into Calcutta from Mirzapore, the Baboo's native friends immediately connected with Mirzapore, agree that *not less* than ten to twelve lacs of rupees' worth of goods imported by sea are despatched every month from this to Mirzapore only, and that the expense of conveyance is *not less* than 3½ to 4 per cent. on the invoice value of the goods; and further, that by Railway they would willingly pay something more for sake of despatch."

Very truly, R. J. CHAMBERS.

30.

COPY OF A LETTER FROM W. BLUNT, ESQ.

31st August, 1844.

Sir,—In reply to your note, I beg to say that we have no means of ascertaining what quantity of salt is carried annually into Behar west of Rajmahl; but there are good grounds to believe that it is not less than six lacs of maunds;* however, Mr. Torrens, the Secretary to the Board, is the best person to apply to for correct information on this subject.

Your obedient servant, W. BLUNT.

31.

COPY OF A LETTER FROM W. THEOBALD, ESQ., RESPECTING THE
BURDWAN TRADE.

Tuesday, Calcutta.

My dear Stephenson,—Conformably with your wishes I have laid the letter containing your inquiries respecting the amount of traffic from the Burdwan Collieries, and the cost of transport to Calcutta, before my friend Dwarkanath Tagore. His replies will be found appended to the original letter, which I now return. He is very desirous to have a Railway to the Collieries, and would raise one-third of the capital for this portion of the line, if undertaken immediately. I think there is little doubt that if there is a Railway, new mines would be opened,

* About 22,222 tons.

as you are aware that the difficulties of the river navigation occasion the loss of many months before the coals can be brought to market, and consequently the coal business is carried on at a great disadvantage from this cause alone.

I am, my dear Stephenson, yours truly, WILLIAM THEOBALD.

32.

COPY OF A LETTER FROM DR. J. M'CLELLAND, A MEMBER AND SECRETARY OF THE COAL COMMITTEE.

My dear Sir,—You will perceive this larger geological map you were referring to was not original or authentic, and was probably taken from the little coloured sketch prepared by myself in the reports of the Coal Committee, 1838, herewith sent. The sketch in question is on a small scale, but the nature of our information of the geology of India would not admit of a larger or more definite drawing with any regard to accuracy.

As it is, I consulted all papers and authorities, published and unpublished, that I could obtain, and could produce nothing better from the result than this little insignificant sketch. I have here marked the coal districts on the annexed copy more prominently than they were marked on the original, and have added several additional coal districts not laid down on the original sketch, from discoveries which have since been reported to the Committee. You will find all those localities marked to be described in the body of the proceedings of the Committee as affording good coal.

Our authority in every instance was specimens of the coal itself sent to us by the public functionaries on the spot, with such particulars regarding it as their acquaintance with such subjects (generally very limited) enabled them to communicate. Coal occurs extensively in eight provinces, namely, Tenasserim, Arracan, Orissa (Cuttack), Bengal Proper (Burdwan), Sylhet, Assam, Rajmehal, Behar, and Nerbudda. In every instance iron ores—either the common clay iron stone or red or yellow iron stones, containing from 30 to 50 per cent. of iron—occurs with the coal, or extensively in the same district.

With regard to Railroads, the objection to a long line at the commencement will probably consist in the greater period of time that must elapse before any return can be expected, and the uselessness of one portion of the line until the whole be completed.

Referring to the great lines of railroad in America, they seem rather to have consisted of a number of separate undertakings, begun and carried out for separate and independent objects, though naturally (as the interests of all such undertakings must necessarily incline to) linked on to one another.

This lessens the risk and removes many of the objections that parties might have to a more extensive undertaking, though it might come to the same thing in the end. I must candidly confess, therefore, that I would rather see your energies directed to, and fixed upon, some definite piece of road between two important points, and within a moderate limit, such as the road at Bombay: say, for instance, from Cutwa to Sicrigully, on the line of the proposed canal, shares for such an object would be taken up at once; or, a road from Agra to Allahabad, thus avoiding the difficult navigation of the Jumna, leaving the Ganges as far as it is available to form the great central line of internal communication, relieving it by means of the railroad merely at those points where scarcity of water interrupts the navigation; namely, from Cutwa to Sicrigully, and from Allahabad to Agra and Futtegur, such limited designs would find ready support, and could be carried out successfully in comparatively short periods of time, and in my opinion, be altogether devoid of risk and uncertainty.

They would also, in my opinion, be more likely to secure the support of Government, as instead of superseding, they would stimulate other corresponding change and improvements on the rivers. These, we ought, in my opinion, to take advantage of. Recollect the rapidity with which heavy goods are passed down the Ganges from Allahabad, and Mirzapore to Sicrigully. The delay from thence to Calcutta in the cold weather is from the want of water in the Bhagurruttee, and the consequent necessity of going round the Sunderbands. A road from Cutwa to icrigully would obviate the necessity for this, and secure an equal period for the transmission of goods from Allahabad and Mirzapore and other great marts on the Ganges, all the year round.

I do not however know anything of railroads from experience, and I offer these hints merely at random. I have, however, been long thinking of internal improvements, such as might be effected in the Bengal Presidency, at least cost and risk with the greatest prospective benefit. Canals, in dead, flat sandy plains, in which the waters are heavily laden with earthy deposit, would probably be far more difficult to execute, and expensive to keep in order than railroads, while the advantage of the latter for rapid communication, would be beyond comparison.

But I would prefer the rivers as far as they are open and navigable to either, and where they are not so, let them be connected and improved by means of railroads or other means of communication.

I hope to see you out again shortly with strong back and some well-defined object in hand, and the means to execute it,

I remain, my dear Sir, yours very truly,

J. M'CLELLAND.

33.

COPY OF A LETTER FROM J. MACINTOSH, ESQ. (MESSRS. BURN AND CO. BUILDERS.)

TO R. M. STEPHENSON, ESQ.

10, Strand, 16th September, 1844.

My dear Sir,—Agreeably to your request, I send you eight specimens of country wood, viz. :—

- No. 1. Teak, the best wood I know in any country.
2. Saul, used for house and ship work, good.
3. Sissoo, used by coachmakers, boat builders, &c., good.
4. Toon, used by cabinet and chairmakers.
5. Soondree, excellent fire-wood ; also shafts for gigs and carts, handles for tools, &c.
6. Red Jarroll, used for packing boxes and for the Natives doors and windows, there are three kinds, but all inferior.
7. Gimiblar, an inferior wood used for light work ; I also send you three pieces of bamboo, but believe they are all of the same kind, I will send you others in the course of to-morrow morning, if they can be got in the Bazaar.

I shall be ready and willing at all times to attend to any thing you may require here, wishing you a good passage, health, wealth, and happiness.

I remain, yours very truly,

P.S.—No. 8. Poon, an inferior wood, used for ships masts. Annexed you will receive the prices of materials you required :—

J. MACINTOSH.

*. * Annexed are the prices of materials you required.

PRICES OF MATERIALS.

	Present prices in Calcutta.	Prices on the spot wherever made or found.	Prices at which large quantities could be supplied.
BRICKS	9 in. at 2rs. 6as. per 1000	2rs. 0as.	2rs. 6as.
"	11 in. at 4rs. 12as. per 1000	3 14	4 11
"	11 in. (arch) 8rs.	6 14	8 0
LIME (first quality)	at 41rs. per 100 mds.	12 0	38 0
" (second quality)	at 38rs. per 100 mds.	10 0	35 0
SLATE	none in use.		
TILES	2 ft. at 42rs. per 1000; 12 in. at 12rs. per 1000.	36 0	40 0
"	16 in. at 22rs. per 1000; pan or roof tiles at 15rs. per 1000 ..	20 0	21 0
"	15 in. at 42rs. per 1000	36 0	40 0
SHINGLE OR BALLAST	none in use.		
TIMBER (rough)	Teak at 55rs. per ton of 50 feet.	not known.	46 0 to 50 0 per tn. #
"	Saul at 36rs. per ton of 50 feet.	"	30 0 to 33 0 per tn. #
"	Sisao at 30rs. per ton of 50 feet.	"	26 0 per ton.
TIMBER (cut in plank)	Mahogany, 3 to 6as. per foot, according to quality	"	0 4 per foot.
"	Teak, 6 in. thick at 46rs. per ton.	"	42 0 per ton.
"	" 2 to 4 in. thick at 56rs. per ton.	"	50 0
"	Saul		
"	Sisao, &c. } none.		
SAND	best washed at 14rs. per 100 ferrals	7 0	13 0
"	unwashed at 12rs. per 100 ferrals	6 0	11 0
STONE (and of what description)	Chunar at 85rs. per 100; each 2 ft. square and 3 in. thick ..	not known.	90 0
"	" at 45rs. per 100; each 18 in. square and 2 in. thick ..	"	41 0
"	China marble at 15as. per ft. square and 6 to 1 in. thick	"	0 14
"	Calhness pavement at 10as. per ft. square 6 to 1 in. thick ...	0 4	0 9
LABOUR, and average number of men to do a day's work of a European ..	{ about 3 Ego'd men		

Copy of a Letter from R. N. C. HAMILTON, Esq., C.S., Resident at Indore, and Agent to the Governor General, on Special Commission to Sirsa and Bhawalpore.

Indore, Sept. 5, 1844.

Dear Sir—In the *Gazette* of the 24th, I saw your letter to the Deputy Governor of Bengal about railroads, and though a total stranger to you, I venture to address you, having for some years given my attention to this subject, and but for recent changes might probably have ere this been mainly instrumental in getting up a scheme in the north-west provinces.

As far back as 1834, I wrote a paper on railroads in the Doab, which was published in the *Meerut Observer*, and from that time I have been thinking over the subject and collecting information.

Lately I have addressed the Government on the subject, but there is an interdiction to making public such communications.

I would draw your attention to a paying line, and one on which you can make a good experiment.

All the cotton, salt and stone, which are the three staples of that commercial place come by land. A railroad from Hodal, midway between Agra, Delhi, via Deig, Combheer, Bhurtpore, Robass, to Agra,* would catch all, or nearly all the trade in transit, the distance about eighty miles, of which the greater part is in the Bhurtpore territory, and there would be no difficulty in getting land there; the returns would be very handsome from the import trade to Agra, there are no obstacles to cost or outlay to overcome, no rivers; materials (bricks) easily made, and I should think no reason to expect a heavy outlay. The Rajah would take shares, labourers would be plentiful. The scheme is worth your attention.

The next point for your consideration is a railway in the valley of the "Nerbudda," from Baroche to Jubbulpore, keeping the left bank of the river. The navigation of the "Nerbudda" is not practicable, the falls here and there are great, but except near Hirun Pall, I do not think there is any great difficulty, and even at the Hirun Pall (the Deer's Jump), there is nothing that could not be overcome by science; the whole trade from Bombay to Delhi, and westward, would come by the road as far as Akbinpore, the whole of the Malwa opium and trade downwards, would there take the rail and go to Baroche. Small steamers there would deliver all in Bombay, and *vice versa*. I sent a map to Mr. Currie, on which I traced the line. There are coal, iron, and other products on the Nerbudda, which could become valuable, the grain of Jubbulpore and its cotton would go down, and salt and other things be brought up, to say nothing of Government stores, troops, &c. In a few years the Nerbudda is to take the place of the Ganges as the sacred stream. There are various chiefs and states who would all contribute, and there would be no difficulty in getting work people. I look upon this as one of the grandest lines, it would open an immense tract of country now locked up.

I have urged in excavating the Ganges Canal, to make one embankment, so as to adopt it for a railroad, this would occasion no additional outlay, and afford better foundation for a grandline from "Allahabad" to near Dasnah, whence a branch to Delhi, at the point where the Delhi and Meerut road would cross the Canal. The rail would go up to near Sabarumpore, the terminus for the Punjab trade.

* This line of railroad would bring the Agra Majun three weeks nearer the frontier, and eight marches would be saved, as the distance could be done in twelve hours. About Deig and Combheer all the salt is made.

If I can be of any assistance in any way, or aid in collecting or supplying information I shall be glad.

Believe me, yours very faithfully,

R. Macdonald Stephenson, Esq.

R. N. C. HAMILTON.

36.

Copy of a letter to W. THEOBALD, Esq., with reply relative to Burdwan Coal Trade.

Calcutta, Aug. 3, 1844.

My dear Theobald—The opinion which you mentioned to me this morning, as having been expressed by Dwarkanauth Tagore, in regard to the introduction into this country of railroads, is in full accordance with that of the majority of those who have ever given the subject consideration.

I understand from you that he had stated that the coal sent to Calcutta from the present United Company's Mines in Burdwan, would of itself pay a very handsome dividend upon a line laid down between Calcutta and Burdwan. I am aware of the difficulties under which the colliery owners of Burdwan at present labour, from the want of these facilities, and that they are now, from this cause, unable to bring the coal down a direct distance of seventy-five miles, in less than two seasons, by the circuitous route of the Damooda, and that, exclusive of interest on capital, one house has lost three out of eleven lacs of maunds in the transit in one year, from boats sunk, and other causes incidental to the existing means of transport.

That a railway should be hailed as conferring great benefit, was to be expected under such circumstances, and if Dwarkanauth can give any positive information upon the points contained in the enclosed list, they may be useful to confirm the statistical returns which have already been collected of the trade upon this, as well as upon several other lines throughout India.

Ever my dear Theobald, yours faithfully,

R. MACDONALD STEPHENSON.

Enquiries for Dwarkanauth Tagore.

Replies.

- | | |
|---|--|
| 1. What is the extent of the present trade in coal between Burdwan and Calcutta, by the Damooda? | } About twenty lakhs of maunds. The present collieries are capable of producing fifty. |
| 2. What amount paid for conveyance to Calcutta? | } 7 rupees 8 annas per 100 maunds to Omptah = 1.50.000. 2 rupees 8 annas from Omptah to Calcutta = 50.000. |
| 3. What quantity lost, stolen, or wasted in transitu? | } Twenty per cent. at least. |
| 4. What would be the probable increase to the trade, if increased facilities are afforded for the conveyance of the coal? | } Besides coal, rice, sugar, shell lac, and a little indigo. |
| 5. What price would the coal Company engage to pay per 1000 maunds for transport of coal to Calcutta? | } 10 rupees per 100 maunds. |

FROM CAPT. J. ANDERSON, BENGAL ENGINEERS.

Burdwan, 4th September, 844.

My dear Mr. Stephenson—I received your letter of the 17th ult. some time ago, but absence from the station and other causes have prevented me replying to it until now. I can assure you that I take the greatest interest in your project, and shall be most happy to give you every assistance in my power, but that I fear is very limited. In the first place, regarding levels, the road was made before I came to this division of public works, and there are no levels in the office, nor, from my many duties, could I spare time to take them; but I may say that, from Howrah or Calcutta to the 110th mile stone on the Benares road the country appears to be a dead level: it is not so, however, but the rise is very gradual, and I should think not more than nine inches or a foot in the mile. My division extends to the 119th mile stone; between it and the 110th there are four ridges to be crossed, the highest of which is not, I should think, above sixty feet, and no difficulty would be found in cutting them, or in raising the road between them. Up to these ridges I imagine the road would not require to be raised more than three feet; up to that height the rate in this district would be, including native superintendence, 1 rupee 8 annas per 1,000 cubic feet, and supposing the average width of the embankment to be thirty feet, the cost per mile would therefore be

$$5,280 \times 30 \times 3 = 475,200 \text{ ft. at } 1\text{s. } 8\text{d.} = 712.12.10.$$

For ballast I presume the kunkar or gooting would answer, as, when melted and well rammed, it forms a solid cake like stone. It is found at several places in this division, and is used as a metal for several portions of the grand trunk road, and answers admirably. Between Hoogly and Burdwan (forty-four miles) the average cost of the Kunkar would probably be eleven or twelve rupees per 100 cubic feet, and between Burdwan and Undall, the boundary of my division, a distance of about forty-eight miles, it would be obtained at four or five rupees per 100 cubic feet.

Sal timbers would be brought from the Bancoona district, and for sleepers of $\phi + 7$ scantling, 100 running feet would cost from forty to fifty rupees, including cost of cutting up into shape and conveying to road.

For masonry, bricks can be made at all places in my division. The kunkar above alluded to makes a good cement when calcined, and for foundations of piers, &c., is the best in India, as it sets fast. The rate of masonry may be taken at twelve rupees per 100 cubic feet for plain masonry plastered. For foundations or wells and arches of bridges more would be required, according to their nature.

Between Hoogly and the western boundary of my division, at Undall, the following streams would have to be crossed, viz.:—The Sarusuttee, Muggra, Bankagard Towlah. Over the two former and last I have just constructed suspension bridges of the following sizes:—The Sarusuttee 50+100+50, the Muggra 220, and the Towlah, on Dredge's plan, 27+90+27. The two former are founded on masonry cylinders, the latter on hard clay. The Banka would require a waterway of 150 feet.

The number and size of the calverts required for the railroad would be the same, I presume, as are required for grand trunk road. From Muggra to Burdwan (thirty-eight miles) there are thirty-six drains or calverts, leaving out small drains for irrigation, of one and one and a half feet span; of these thirty-six drains or bridges, one has three arches of twenty feet span each, one twenty feet waterway, one eighteen feet waterway, five twelve feet waterway, three ten feet waterway, and of the remaining twenty-five the waterway varies from two to six feet. From Burdwan to Undall (forty-eight miles) there are fifty-nine drains, of which one

has twenty-one feet waterway, two ten feet, one nine feet, six seven feet, and of the remaining forty-nine the waterway varies from two to six feet.

As to whether the railway will be remunerative or otherwise I fear I am not competent to give an opinion; but I think a single rail from Calcutta to the coal mines, passing Burdwan, would give an ample remuneration on the outlay, supposing the traffic to remain as at present. The distance from Calcutta to the first coal mine on the line of the present Benares road is 125 miles, and for fifteen miles further the road passes over the coal field; the line of railway would therefore be 140 miles. In the accompanying table I have given a statement of the number of carts and bullocks that passed one spot of the road between Burdwan and Muggra monthly for nineteen months; but I must remark that it is the general practice in this country for natives to travel with their carts in the night time, and that it is my opinion that the table, from containing only those that pass in the day time, does not contain one-half the number of carts, &c. that actually pass over the road. I have added to the table a few calculations showing the weight of goods carried (principally sugar, cloth, and thread), but I have only allowed one-third more for carts passing in the night time. I have also made a calculation at assumed rates of the probable out-turn. The rate of five rupees per ton would, I am led to believe, be willingly paid for coals from the mines to Calcutta. At present, in favourable seasons for transporting coals by the Damooda river to Calcutta, the quantity so taken would be about 2,000,000 maunds, or 74,064 tons. In the calculation I have taken this as the quantity; but I have no doubt that, were there a railway, double that quantity would be conveyed yearly. At the rate I have assumed there is another article that would be carried in great quantities, namely, charcoal. It could be procured at from ten to fifteen rupees per 100 maunds near the 110th mile stone, and the carriage by the railway would be about eighteen rupees, in all, landed in Calcutta, thirty-one rupees, where it frequently sells as high as seventy-five rupees per 100 maunds. Indeed I have no doubt that many other articles of traffic would be found that are at present unthought of. I have made a very hurried tracing of the country from Calcutta to the coal mines in pencil (the paper will not take ink), which may assist you in understanding the localities to which I allude.

**STATEMENT OF THE NUMBER OF CARTS PASSING ALONG THE
ROAD BETWEEN BURDWAN AND MUGGRA.**

Months.	Carts Laden to Burdwan.	Carts Empty to Burdwan.	Carts Laden to Calcutta.	Carts Unladen to Calcutta.	Bullocks to Burdwan.	Bullocks to Calcutta.	No. of Days.
1842.							
December	1,745	287	1,471	306	572	1,568	31
1843.							
January	1,806	202	1,954	296	634	2,076	31
February	4,660	2,364	2,252	1,618	1,840	2,432	28
March	3,987	4,496	5,818	4,218	1,422	6,034	31
April							
May	1,171	1,165	956	1,340	951	904	21
June	1,168	279	957	257	3,034	3,605	30
July	1,385	240	1,614	281	2,647	3,236	31
August	1,008	216	1,021	344	1,896	2,355	31
September	1,416	330	1,165	635	2,606	2,495	30
October	1,698	307	2,079	500	2,104	3,153	31
November	2,507	248	1,855	435	2,481	2,663	30
December	2,519	447	2,550	447	2,747	3,165	31
1844.							
January	2,307	503	2,349	403	2,528	3,110	31
February	2,947	602	3,199	582	2,914	3,430	29
March	2,739	370	2,983	419	3,109	3,123	31
April	2,745	313	3,040	326	3,163	3,296	30
May	2,913	237	2,870	226	3,085	3,076	31
June	2,745	188	2,792	173	2,804	2,924	30
July	2,834	242	2,876	214	2,907	3,072	31
Total	44,390	14,036	43,801	13,123	43,446	55,717	579
Daily Average ..	76½	24-24	75-65	22-66	65-1	96-23	—

PROBABLE WEIGHT OF GOODS TRANSPORTED DAILY.

	Carts.	Mds.	Tons.
To Burdwan from Calcutta	76-66	+ 12=919-99	or about 34
" " "	Bullocks.	75-1	1½=112-5 or about 4
" " "			— 88
To Calcutta from Burdwan	Carts.	75-65	+ 12=906-6 or about 33½
" " "	Bullocks.	96-23	+ 1½=144-84 or about 5½
" " "			— 38½
" " "			— 68½
Add one-third for Carts and Bullocks that pass at night, say			22½
" " "			91
Coals from Mines 74,074 ÷ 365=about.....			203
Daily Tonnage			204

After writing the above I saw the Postmaster of this place, who has kindly given me the following items of traffic between Burdwan and Shergotty, 216 miles, viz. :—

Amount paid for 330 palkee dawks	26,448
„ „ for carriage of mail and banghy parcels	47,56
Extra	3,095

Total per annum for 216 miles Rs. 77,111

I have avoided all mention of a railroad beyond the coal mines, as I am not acquainted with the country through which it would pass, or with the traffic there would probably be on its completion. Information on these points, I have no doubt, you will be able to get from others and better sources. Wishing every success to your project, believe me,

My dear Mr. Stephenson, yours truly, .

J. ANDERSON.

STATISTICS OF TRADE,

AND

COST OF MATERIALS UPON THE LINE OF RAILWAY.

38.

TIMBER.—There are several descriptions of timber available for railway purposes in Bengal; but saul and sisso, from their abundance, will probably be found most suitable for works of the kind. The former is a hard though coarse grained wood, and bears exposure tolerably well. I have seen posts which have been five years in the ground, and yet seemed sound. The white ants do not attack it until it begins to decay, and at no time are they very fond of it. It is at present brought down the Ganges to Calcutta from forests at the base of the Himalaya; but it abounds in other directions especially in the hilly tract lying along the Benares road, where it may be obtained for little more than the expense of cutting. The price in Calcutta is generally about half a rupee (one shilling) the cubic foot for squared timber. Round sticks fitted for railway sleepers—that is, seven or eight feet long and seven inches in width, would cost 8d. or 10d. sterling each. Sissoo is a dark, coarse grained, but very tenacious wood, and has at times been much used for ship building. It bears exposure to the weather nearly as well as Saul, and resists the white ants; but it is more expensive in Calcutta. The country in all directions is covered with the Babool—a species of mimosa—which lasts a long time when in contact with the ground. It never grows to a great size; but sticks large enough for railway sleepers might be procured in Bengal in almost any quantity. The price of babool wood in Calcutta for sticks fifteen feet long and about eight inches in diameter is one rupee. In the interior it may be obtained for little more than the expense of cutting. Another species of timber of which there is a great quantity in the hilly districts west of Calcutta, is the Soondree tree. It is very highly spoken of for its durability when exposed; though at present it is not much used, as the means of conveyance to Calcutta are scanty. From the quantity of acid it contains, it is never touched by insects. It might be procured in any quantities at a cheap rate in the districts about Hazareebaugh. At the Fort Gloster mills, saul posts were pointed out to me which had been in the ground sixteen years. They were covered with coal tar, and were perfectly sound.

MACHINERY.—There seems to be no reason to apprehend any difficulty, from the want of mechanics, in the introduction even of the finest steam machinery, in India, without dwelling upon the success attending the employment of the finest machinery in the mints both at Bombay and Calcutta, I would bring forward the experience in the cotton mills at Gloster as conclusive upon the above point. All those acquainted with the nature of the machinery used for spinning cotton must

be aware of its extreme complication and nicety ; of the constant attention—the accurate adjustment and great delicacy required for its management. If such machinery, therefore, can be used at Fort Gloster, by natives, under two European superintendents only—and if it can be altered, repaired and removed, by Native agency, and a cotton mill containing nearly 30,000 spindles can thus be kept in daily use and high order, there can, I think, be no doubt that all the machinery connected with a railway, including locomotives, could be kept in equal order by the same means in any part of India. I must also observe that no difficulty is experienced in the employment of the steam-engine in the neighbourhood of Calcutta, by Natives without European assistance of any kind. I have seen a small steam-boat in which none but Natives were employed, and have been informed by a practical mechanic, long in the habit of working with them, that they acquired a knowledge of machinery as readily, and used it as expertly, as any operatives he had ever met with.

FIRE WOOD.—As the Burdwan coal contains large quantities of sulphur it will not be available for locomotive engines ; but wood will form a good substitute. The fire-wood of India is remarkably powerful and good. In Calcutta it cost from twelve to twenty rupees the 100 maunds, or $3\frac{1}{2}$ tons weight, and on the route to Benares it is procurable at a much cheaper rate. At the above rate, however, it is not more expensive than upon many of the railroads in America, where it is used in preference to coal.

PRICE OF LAND.—The value of land, even in the most fertile portions of Bengal, is comparatively low. In the estimates for some of the canals projected for the neighbourhood of Calcutta, twenty rupees per bega is allowed as compensation ; a bega being equal to one-third of an acre. The rent of ordinary land in Bengal varies from half a rupee to two rupees per bega, and forty rupees per bega would be ample compensation for almost any land required for railway purposes. Among the hilly tracts between Calcutta and Benares the greater part the land is worth little or nothing. By the perpetual settlement, Government have reserved the right of taking whatever land may be required for roads free of all payment.

39.

BURDWAN COAL.—The cost of taking up the coal when quarried from a depth of between ten and twenty feet, we find about half of an anna per maund. The coal is only seen on the surface at some distance inland, both from the Damooda and the Adjye ; and the carriage costs from three-quarters of an anna to one anna per maund, to those rivers. From these ghats on the Damooda to Ompta, the carriage in Charles Betts' time was nine rupees per 100 maunds, but since the monopolists have got both mines it fell to 7-8ths, and is now again 8 rupees. From Ompta to Calcutta I am not certain, but I believe it is four rupees per 100 maunds. The boats can come from Ompta to the mines only in July, August and September, and what has been dug during the whole year must remain at the ghat till those months. These boats must also be extensively advanced for in October for the next season. So to the usual risks of mining, this risk and outlay must be added, taking all things into consideration and including interest and risk, the coal will not cost under four annas per maund in Calcutta. I am told that the coals at Ranneygunge ghat cost C. T. & Co., upwards of 1 rup. 2 as. per maund. Carrying the coals down to Cutwa costs full 2as. per maund, and the navigation is most precarious. Boats up to this day have passed down only once this season, so that the cost of coals in Calcutta and at Cutwa are both nearly alike. I should have mentioned that boats in the Damooda in a good year make six trips, but four and five are more common. (Extract of a letter from James Erskine).

TRADE OF BURDWAN.

Q. What is the number of passengers of all kinds that pass annually along the great road, from Burdwan to Hoogly; and of what classes are they composed?

A. They are innumerable during the dry season, and even during the rains—pilgrims, merchants, and travellers of all sorts.

Q. Is there any communication direct, between Calcutta and the Burdwan district by land?

A. From Sulkea to Hoogly there is a road which people from Burdwan often avail themselves of, especially when boats are scarce at Muggrah ghaut, and also when articles are wanted in return from Calcutta, the troubles of boating, unloading, and uncertainty of finding carts at Muggrah, induce many to adopt this road during the dry season.

Q. How does the produce of this district generally find its way to market, and what is the cost of conveyance by the different routes in use?

A. The produce of Burdwan, and much of Bheerbhoom and Bancoorah is exported chiefly from Culna and Muggrah ghaut; some of the Bheerbhoom produce used formerly to be exported from Cutwa, but the scantiness of water has made the navigation more dangerous, and, whenever it can be managed, people prefer getting on the great , and going *via* Burdwan also. A bag of sugar, two maunds, goes from Burdwan to Muggrah for four annas, but other goods pay nearly double that; last year sugar also paid double, from the scarcity of carts; boat hire thence is very little: one anna per maund, and less.

Q. Is the military road, from Benares to Hooghly, used for conveyance of produce from the interior and merchandise to the upper provinces, and if so, to what extent?

A. I do not believe much of the interior produce comes down by Burdwan, but a great deal of merchandize goes up to Cawnpore and beyond it. The quickness of the route makes up for the greater expense going up; but in coming down boats are still resorted to.

Q. How are Burdwan and the Southern portions of Behar supplied with salt and other articles from the coast, and what is the expense of their transportation to the interior?

A. The return carts from Culna and Hoogly bring salt, and some boats also bring a little during the rains. The expense of carriage cannot be above three annas per maund.

Q. What is the probable amount of such trade?

A. Of the extent of the salt trade I have no notion.

Q. Is there much grain and other agricultural produce sent to market from Burdwan, and the districts upon the sources of the Damooda and Adjee, and if so by what routes, or does the expense of carriage prevent its removal?

A. A great deal of grain used to come down the Damooda, and still the quantity is considerable. It is brought down and sold in general at Rajbullnot, or near that place, and Ompta grain seldom goes by land, a large quantity used also to come down the Adjee to Cutwa, but the tedious navigation of the Adjee has changed the route; Sheerghur grain is carried to the banks of the Damooda, and any that is below Sheerghur is carried on bullocks to Loopore from Manly ghat. There the Adjee is generally accessible for boats of 400 maunds during the whole of the rains.

If any channel for the transit of the produce of this district was formed, possessing exceeding advantages, there can be no doubt that the traffic of this district, and also the chief part of the traffic of the neighbouring district would be drawn

to it. Even the slight advantage that the good military road gave, draws to Burdwan much of the produce of Bheerbhoom and Bancorah; the Culna road too is much given up, because the Hoogly road is better, and so great is the number of carts on the road from Burdwan to Hoogly, that it is almost impossible to keep that road in good order, in spite of the expense and trouble laid out on it, that part of the road is also broken up by the Damooda overflowing.

J. ERSKINE.

41.

EXPENCE OF EXCAVATION IN INDIA.—By careful and necessarily very laborious examination of the system of levels, transverse and longitudinal, furnished by Lieutenant Cunningham, and on consideration of the rate of labour ascertained, it appears that in the line of least cutting, and that otherwise best adapted for the navigation, the quantity of earth to be excavated on the Rajmahal canal would amount to 41,100,000 cubic yards, which at the rate of twenty cubic yards to a rupee, will cost in digging 20,55,000 rupees. The rate of digging here taken may, however, be considered a high one, as in the table of the rates given by Lieutenant Cunningham, he states the cost of excavating tanks near Jummoo Kandee to the depth of twenty-one feet, or that ascertained by the Rajmahal Canal survey to stand per rupees as follows:—458 cubic feet, 578 cubic feet, 686 cubic feet, the average of which is 574 cubic feet, or twenty-one one-third cubic yards for a rupee, and it is to be observed that this is for excavating tank work (in which the earth raised has to be carried a great distance), to the depth of twenty-one feet, whilst the average depth of digging in the canal will only amount to nineteen three-quarters feet.

42.

REPLIES TO ENQUIRIES BY J. SHAW, ESQ.—The rate of travelling per diem varies of course agreeably to the pleasure of the traveller, and also to the condition and capabilities of his beast. I don't think many exceed twelve or fourteen miles a day, and the journey between this and Calcutta, a distance of about seventy miles, occupies between four and five days; some, of course make it in less time, when necessity urges them onward. The expenses also must be guided by circumstances; the hire of a hackery and pair of bullocks from this to Hooghly for the trip, a distance of forty miles, costs 2r. 8s., and to Calcutta from four to five rupees.

This brings me to the fifth query; and I am at a loss to understand why the good folks seeking for information should be at fault upon this point, when it is so well known that with the exception of crossing the Hooghly at Pulta ghaat, the great western road running through Burdwan, leads straight into Calcutta; but there is also, I believe, another route, though not frequented, direct by land to Hawarli, proceeding through Serampore, and keeping the western bank of the Hooghly; in this, with the exception of a few small rhalls or nullahs, the journey may be accomplished; and were a railroad to be established, I should imagine that having the terminus at Howrah, the undertaking might be effected without meeting any large river to cross, or other formidable obstacle; and passengers and goods might be easily transported across the river Hooghly at a trifling extra in small steamers, or flats above the shipping.

In treating of the sixth query, it is necessary to say that the chief produce of this district consists of rice, sugar, flax, indigo, lac dye, and shellac, which if conveyed to the different marts or gunges, nearest to the spot, and within a reasonable distance from where it is produced and manufactured. For instance, a large quantity is taken to Cutwa and Culna, two large and populous marts in this

district, and situated most conveniently on the banks of the Bhagur ruddy and Hooghly, where the articles of commerce are either stored or conveyed by boats to Calcutta, as the supply and demand may best suit the speculative spirit of the merchant. Again, the produce of the interior of the country, as rice, sugar, flax, indigo, &c., obtainable at a distance from these two said marts, is conveyed by hackeries, and on the backs of bullocks, as the case may be, to some of the gunges in the Hooghly district (sometimes to be disposed of by sale, but more frequently for the convenience of transportation), to Tribouner and Hooghly, where it is placed on board of boats and carried to Calcutta.

About one and half miles from the station of Burdwan there is a famous mart for sugar, called Kunchun-nuggur where the article is brought from the different parts of this and the Bancoorah districts, and there it finds a ready market, there being several agents residing in the village, employed by mercantile houses in Calcutta, who purchase the sugar, and convey it by hackeries to Tribouner and Hooghly, from whence it is transported by water to Calcutta. This is one of the chief sugar marts in this part of the country, and to give you an idea of the quantity the officiating collector, Mr. Russell, kindly furnished me with the following memorandums for which claims, or passes had been granted from his office :—

In 1839-40.....36 passes.....121,963 maunds.

In 1840-41.....80 ditto140,000 ditto

—
261,963 up to June, 1844.

The expences of conveyance vary according to circumstances, such as the kind or condition of the contract or agreement entered into by the merchant with the conveyor, which may be merely for the trip, or by monthly engagement, for many hackeries return to the interior with salt and other produce, where water carriage is not procurable, and which is the case in and about the town of Burdwan. The traffic in sugar from Kunchun-nuggur is considerable, and the mode of conveyance to Calcutta expensive, as one hackery will not transport more than ten maunds, if so much, and then there is the boat hire besides, from Tribouner or Hooghly.

During the dry season, the military road from Hooghly to Benares is much frequented, and merchandise to a considerable extent is conveyed to the Upper Provinces from Calcutta, but the quantity will bear little proportion to what is transported by water. This road is also used for the carriage of produce of the interior of this the Bancoorah and Burbhoom districts, viz., rice, sugar, indigo, lac dye, shellac, hides and horns, and conveyed, as above stated, by hackeries to Tribouner and Hooghly; but it would be impossible to state, for want of proper means, the probable quantity of each conveyed in this manner to market. One hackery will convey from 100 to 150 hides, according to the size and weight of the hide, and the regular charge for each maund of goods is four annas.

The interior of the Burdwan district is chiefly supplied with salt from Sulkea, from whence it is conveyed in boats to Hooghly and Tribouner; it is then placed in hackeries and bullocks, and transported into the district; but I do not believe that any salt is conveyed by land, via the military road, into the southern portions of Behar; it may, however, in this mode be carried into Bancoorah and Beerbhoom.

Very little of the produce of this, the Bancoorah and Beerbhoom districts, excepting coal, is conveyed to Calcutta, via the Damooda and Adjye rivers. I may here observe that a considerable quantity of salt and cocoa nuts is transported by boats from Calcutta and Ampta in the Hooghly district, up these two rivers, especially the Damooda, to different marts during the months of July, August and September, when the rivers are navigable.

From the enquiries I have made I am led to believe that the introduction of a railroad through this district would be favourable to its prosperity, and in no way interfere with the revenue derivable from it; on the contrary, it would tend to enhance the resources and advantages of the cultivator and land owner, by finding a more ready and speedy transition of their cases and goods to market. The only class of men which such an innovation would affect for a time, would be the owners of hackeries and bullocks, and who are employed as above related; but they would again find employment in transporting goods from the interior to the different railway stations. I consulted the Rajah on the subject, and he was clearly of opinion that it would be beneficial to the country, and was highly pleased at the idea of its introduction.

I regret the information thus furnished should be so imperfect, but I hope you will take the will for the deed, and had better been procurable or within reach, you should certainly have had it. Believe me, yours very sincerely,

J. SHAW.

43.

STATEMENT OF FREIGHT AND PASSENGERS IN THE IRON BOATS, BETWEEN THE 1ST OF SEPT., 1840, AND THE 31ST AUGUST, 1841.

Q. How much freight and treasure have the iron steamers carried from Calcutta up the Ganges as far as Patna (including the freight and treasure to Allahabad and intermediate places) during the last twelve months?

A. The tonnage has amounted to 57,160 cubic feet, not exceeding 30lb. per cubic foot, besides 393,179 pounds weight carried upwards.

Q. How much have they brought to Calcutta from Patna and above as far as Allahabad?

A. 6,650 cubic feet, besides 231,787 pounds weight have been brought down. The treasure carried upwards has amounted to 11,034,198, and downwards 800,375

Q. What has been the average rate of freight by the iron steamers to and from Allahabad during the last twelve months? ●

A. The average paid by the public has been 2Rs. 10as. 10pp. per cubic foot. Government freight has been credited to the boats at the fixed charges of 1r. 8a. per foot. Freight carried in large boats is charged one anna per pound weight. Freight brought downwards is charged eight annas per cubic foot, and one anna per 3lb. weight. Treasure to Dinapore pays six annas per cent., to Benares eight annas, to Mirzapore ten, to Allahabad twelve.

Q. What number of passengers have the iron steamers carried each way between Calcutta and Patna (including all proceeding to or coming from places above) during the last twelve months?

A. 392 passengers have proceeded upwards, and 151 have come down.

Q. Have natives proceeded as passengers in the iron boats, and if so, to what extent, and at what rates of passage money?

A. No natives, excepting some of the higher ranks, have been passengers in the boats; these have engaged cabins, and paid the established rates. Deck passengers are charged one anna per mile, but very few avail themselves of the steamers.

Q. Do native traders, and natives of other descriptions, shew a disposition to take advantage of the steamers on the Ganges, and do they fully appreciate the saving of time they occasion?

A. Native merchants are the principal shippers. When freights are high they send valuable goods, but seldom accompany them. They fully appreciate the saving of time and insurance, &c.

Q. What has been the average time occupied by the steamers in the passage between Calcutta and Allahabad during the last twelve months, and what are the extremes?

A. The average of a voyage to Allahabad is twenty-five days; the longest occupied thirty, the shortest was performed in nineteen.

Q. Is there any means of estimating the quantity of merchandise that passes annually along the rivers each way between Calcutta and Patna, and the districts beyond, and if so, what is its probable amount?

A. I am unable to answer these questions satisfactorily.

Q. To what extent would merchandise be sent by steam, provided the charges for freight were reduced, and additional steamers were available?

A. If freight could be reduced, the demand for tonnage might be ten or twenty fold what it now is; but the fixed rate of 1r. 8a. per cubic foot does not pay the expenses of the steamers, the balance is made up by freight laid upon treasure, this advantage has hitherto been distributed among four boats. The transfer of bullion is not likely to increase, but the advantage of its freight will now be divided amongst eight boats. I can conceive no probability of a reduction of the charges of steam freight, unless coal can be supplied at a cheaper rate, or the channel of the river be deepened, so as to admit of boats of much greater draught than those now employed, which are limited to 2 feet 6 inches, or at the utmost to 3 feet. Calcutta, 10th Nov., 1841.

44.

EXPENSE OF TRAVELLING IN INDIA.

Travellers between Calcutta and Benares proceed in a variety of way viz. :—

1st. On horseback, or rather on tatoos.

2nd. In carriages, of which there are three kinds—namely, the chuckra, the eka, the rutha.

3rd. On foot.

4th. In boats.

5th. In palkees or dhooleys.

6th. By dawk.

7th. By steam-boats.

The expense attending the journey is as follows :—

	Rupees
<i>On Horseback.</i> —Value of a pony which is purchased, and sold at the end of the journey.....	15
Feeding the animal.....	8
Allowance to Syce	7
	—
	Rupees 30
Deduct value of pony resold.....	7
	—
Total Rupees	23

May therefore be taken as the expense of a journey by land between Benares and Calcutta, exclusive of food and lodging.

By Wheel Carriage.—The hire for a chuckra, which will carry three persons, is 25 rupees; for an eka, for two persons, 30 rupees; for a rutha, carrying four persons, 60 rupees. The charge for crossing rivers and other expenses, amounts to 8 rupees in addition.

On Foot.—It is difficult to arrive at the expenses exactly of a journey on foot;

a small sum for protection and accommodation is paid every night at the serais for foot passengers, but the allowance for the journey among natives, when a messenger is sent on foot is 10 rupees, which includes wages, food, and all charges.

By Boats.—A boat of six oars, capable of taking from six to ten persons, costs for the passage 60 rupees. The toll is three rupees, and the sums paid to Chokeydars to prevent detention, and for other contingencies, are estimated at 12 rupees. The expense, therefore, exclusive of food, by boats, may be estimated at 75 rupees for from six to ten persons.

By Palkee.—In this mode, by taking eight bearers, about fifteen miles are accomplished daily; it is attended, however, with considerable danger from robbery; and natives who adopt it generally take a couple of followers as a guard.

By Dawk the charge is half a rupee per mile or about twenty-two rupees.

To the above charges must be added the expense of food and other contingencies, which vary from two annas to five rupees per diem.

The time occupied between Calcutta and Benares is

On horseback, from	15 to 18 Days
By wheel carriages	15 to 22 "
On foot	18 to 20 "
By boats	30 to 45 "
By palkee	15 to 18 "
By dawk	4½ to 5 "
By steam	15 to 25 "

The natives of Bengal generally prefer the route by water, as it is attended with less exertion. But the people of Hindostan and the Upper Provinces, generally go by land on horseback, or in carriages. The poorer class are forced to proceed on foot.

45.

TRAFFIC ON THE MILITARY ROAD.—Traffic over the Annabad Bridge, on the great Burdwan road.

Average monthly traffic—wheel carriages	568
Bullocks laden	10,621

Military Boards Report on Public Works, 1837.

46.

TRAFFIC BETWEEN HOOGLY AND BURDWAN.

Q. What is the number of passengers of all kinds that pass annually along the great road, from Burdwan to Hoogly, in each direction?

A. About 73,000 foot passengers in all; hackries 7,360; laden bullocks, 3,650 private palankeens, 790; public daks, from Hoogly along the great Trunk road 335, during the past year.

Q. If no means exist of arriving at the number with some approach to accuracy, give an estimate of the amount daily at various seasons of the year?

A. About ten days before and after Doorga Pooja holidays, about 300 persons and 30 palkees, daily travel this road to and fro. In December and January one or two, sometimes three gangs of 50, 100, and 150 pilgrims pass daily Gunga

Saugor to both, &c. ; about twenty days are occupied in the going and returning of these men:

Q. Of what classes are the travellers on the road composed ; and what proportion does each class bear to the whole number ?

A. This question is in a great measure answered before. Perhaps half the foot passengers may be able to afford one or two rupees passage-money for the trips.

Q. Do many proceed in conveyances of any kind, and if so, what is the expense of travelling by them, and at what rate do they proceed per diem ?

A. From the first answer given, it will be seen palankeens are the conveyances generally, it may be said, alone used ; other conveyances are scarcely in use. The expense of a trip in a private palankeen, from Hoogly to Burdwan, is from seventeen to twenty rupees, and about two days, more or less, will be occupied. The public dâks, from the Hoogly to and through Burdwan, have been shown to be in the past year, 335 in number ; the rate of travelling being four miles an hour, and expense eight annas a mile.

Q. Is there any communication direct between Calcutta and the Burdwan district by land ?

A. No, there is not.

Q. How does the produce of this district generally find its way to market ; and what is the distance and the cost of conveyance by the different routes in use ?

A. In hackeries, occasionally on bullocks to the markets, in the neighbourhood of Hoogly, by the great military road, to those near Sulkea and Calcutta, *viâ* Jehanabad and Chundeetullah. The former route is about forty, the latter fifty miles. The cost of conveyance of each trip is three or four rupees for twelve maunds of goods, which is a hackery load.

Q. Is the military road, from Benares to Hoogly, used for the conveyance of produce from the interior, and merchandize to the Upper Provinces, and if so, to what extent ?

A. Yes, great quantities of shawls, shawl-handkerchiefs, kim-khobs, silks silver and gold lace are forwarded by this route from Benares and the interior, *viâ* Hoogly and Sulkea to the Calcutta market. It is impossible to learn the extent of this trade here ; but it can easily be ascertained from the native merchants in Calcutta, as there are not above a dozen who, in the first instance receive such investment from the interior.

Q. How are Burdwan and the Southern portions of Behar supplied with salt and other articles from the coast, and what is the expense of their transportation to the interior ?

A. By the river to Hoogly, thence by land. By the river to Kulna, for the supply of that part of the district and its neighbourhood. From Zumlook *viâ* Ghuttal and Kasheegunge, where there are large salt golahs to Kootulpore and Bishenpore, in the Burdwan district. The expense of transportation is in proportion to that given in the sixth answer, but may be considerably less to large merchants, who keep their own cattle and carts or boats.

Q. What is the probable amount of such trade ?

A. From Hoogly and Muggra, a large salt mart about six miles on the Burdwan road, the amount of the salt sent to the Burdwan market is 150,000 maunds. From Zumlook, *viâ* Ghuttal, Kasheegunge, to Kootulpore, and other places in the district of Burdwan, 200,000 maunds, more or less ; of other articles the trade may amount to 100,000 rupees, at a rough calculation.

Q. Is there much grain and other agricultural produce sent to market from Burdwan, and the districts upon the sources of the Damooda and Adjie ; and, if so, by what routes, or does expense of carriage prevent its removal ?

A. Grain is seldom, if ever, imported from Burdwan, or the districts of the

Damooda or Adjie. A considerable quantity of gour and sugar, estimated at 500,000 maunds, and cotton valued at 10,000 rupees, is yearly sent to market from those districts by land, if from the neighbourhood of Burdwan; but if from the district of Beerbhoom and the adjoining parts, by the river from Cutwa.

47.

ADDITIONAL QUERIES.

Q. Do the returns from Hoogly embrace the traffic from Muggra ghat, or are they confined to Hoogly?

A. The returns embrace the traffics from Muggra ghat as well as that from Hoogly.

Q. Do the 73,000 passengers, and the carts, &c., mentioned in the first answer, include those that pass in both directions, or represent the traffic midway only?

A. The passengers, carts, &c., mentioned in the first answer, include those that pass in both directions, with exception of the public daks (as stated in that answer regarding which, information of those from Hoogly only could be ascertained here).

Q. From answers number nine and ten, it would appear that in sugar and salt alone, there is a traffic of 650,000 maunds to and from the Burdwan district. Now, this would require about 54,000 carts for its conveyance. It appears, however, by answer one, that there are about 7,360 carts, and about half that number of bullocks annually on the road from Hoogly, and the inference is, that much the largest portion of the trade is carried on by other channels. Is this correct, and, if so, what are the channels, and is there a large passengers' traffic by them?

A. Of the amount of traffic of sugar and salt estimated at 650,000 maunds, the 150,000 maunds of salt from Hoogly and Muggra ghat to Burdwan, will require a proportionate number of carts for their conveyance, in excess of 7,360 hackeries and as the eighth answer mentions the proportion of expense of transportation by land, it appeared unnecessary to calculate and note down the exact number of carts. The 500,000 maunds of gour and sugar given in the tenth answer, is only partly conveyed by land, partly by the river from Cutwa; the exact proportion cannot well be ascertained, but it is supposed that 300,000 maunds may be conveyed by water, the carriage by which is much cheaper, perhaps by half; and 200,000 maunds by land, *via* the military road to Muggra and Hoogly, and by the old road passing through Jehanabad, Rajbulkut, Chundectullah, to Sulkea; the greater quantity by the first route. By the latter road the passengers' traffic is confined to the neighbourhood, and cannot be very large. What it may be by the river from Cutwa, in the Burdwan district, there is no means of ascertaining. The carts for the land carriage of the 200,000 maunds will also be in excess of the 7,360 hackeries given in the first answer. As far as can be ascertained, there are no other channels in this trade besides the three already given.

The contract price paid by the Erskines for the transportation of sugar from Soonamooke to Hoogly, a distance of ninety miles, is 4 rupees 12 annas, for a cart load of twelve maunds, or 1,008 pounds. The cart generally is employed to take back salt at half price.

The uncertainty of the navigation by the Adjie is so great, that the coal owners cannot venture to enter into contract for the supply of coals in Calcutta. They are obliged, therefore, to keep a depôt at Calcutta, and meet the demand from supplies brought down as opportunities may offer, and stores.

ABSTRACT OF THE RETURN OF TRAFFIC OVER THE ANNABAD BRIDGE DURING THE YEAR 1897-98.

PASSENGERS.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total.
on Foot.....	39,735	31,714	28,139		28,896	31,713	36,731	39,811	44,440	47,281	53,104	50,678	435,242
On Horse-back	2,983	986	946		863	1,307	2,500	2,275	2,319	2,031	1,774	1,879	19,869
In Bullock Carriages.....	1,446	612	381		408	567	345	791	1,517	989	1,289	949	9,314
In Horse Carriages.....	187	70	87		50	91	139	103	151	128	115	143	1,373
On Elephants.....	15	5	10		16	3	7	21	49	37	77	8	243
On Camels.....	27	2	10		30	23	25	28	86	65	61	33	389
In Palankeens.....	91	36	58		43	55	77	79	113	92	83	96	833
In Doolies.....	317	84	52		48	62	92	90	147	116	151	106	1,265
CARRIAGES—													68
Drawn by Bullocks.....	715	339	247		204	199	153	416	750	508	591	378	4,498
Ditto, Horse.....	150	65	67		40	71	107	75	108	85	81	86	946
Palankeens.....	91	36	60		45	56	82	86	116	93	87	98	850
Doolies.....	319	87	69		60	77	105	113	200	135	168	115	1,448
CATTLE—													
Bullocks.....	9,419	8,938	7,733		4,443	1,692	10,332	13,829	14,963	14,347	11,321	14,750	111,767
Horses.....	3,296	1,310	1,264		1,056	1	3,310	3,403	3,271	2,537	2,292	2,361	24,191
Elephants.....	6	4	5		6	28	4	16	33	17	48	4	171
Camels.....	195	18	17		56	5,248	34	102	113	170	235	141	6,329
Sheep and Goats.....	514	163	236		790	979	1,871	1,983	4,291	3,845	4,707	6,109	26,498
Asses.....	18	30	84		64	54	72	69	115	71	77	94	748

(Signed)

GEO. THOMPSON, Bengal Engineers,
Superintendent of Road.

49.

REPLIES TO QUERIES OBTAINED THROUGH M. RUSTOMJEE, Esq.

Q. What is the total expense of conveying piece goods from Calcutta to Mirzapore, by land and by water?

A. From 35 to 40 rupees for each hackery, carrying 12 maunds, besides eight rupees for a chaprassée, and by water, 250 maunds will cost 150 rupees.

Q. What is the time required for conveyance from Calcutta to Mirzapore?

A. Six weeks or two months.

Q. What is the expense of conveyance from Mirzapore down the river to Calcutta, for cotton and other produce?

A. From 1 rupee 4 annas to 1 rupee 8 annas per bale of four Calcutta maunds, or three Mirzapore maunds.

Q. What is the expense attending the journey by land from Calcutta to Benares to natives of various classes; for instance, to the wealthy native trader of moderate means—and lastly, to the poor description of pilgrims, and other individuals (such as servants and soldiers on leave of absence), who may have occasion to pass from Calcutta to the Upper Provinces?

A. From 150 to 200 rupees, with twelve bearers. In a gharry will cost 100 rupees, and if in a palanquin 125 rupees, besides 25 rupees for a banghey to carry eatables, &c.

Q. What is the expense attending the passage by water along the river of individuals of the above class, between Calcutta and Benares?

A. From 180 to 200 rupees.

Q. What is the time usually occupied by each of the above routes; are there any advantages or disadvantages which give one route the preference over the other?

A. Eight days, by dāk from six weeks to two months?

Q. What is the expense of carrying other articles, such as metals, &c., from Calcutta to Mirzapore?

A. From 125 to 150 rupees.

50.

ROAD BETWEEN ALLAHABAD AND CAWNPORE.

There being in existence no registers of carriages or commodities passing in different periods, this opinion is only to be trusted to for the increase which the formation of the road has occasioned, and the belief of the officers who have been in immediate charge, is to this effect. That in all the more finished parts of the road, journeys have been lengthened, and that, though carriers under hire for time may not have increased their daily stages, all other classes engaged in transport have done so. All those who have been employed in the execution of the road, assert unequivocally that there has been a great increase of traffic, and the officer now in charge, who has been engaged on this duty from 1833 to the present time 1840, conceives the communication has quintupled since the first year named. It is mentioned, that, formerly it was rare to meet with more than a single cart here and there; now, except in the rainy season, numbers may be counted in a morning march, and, indeed, they are not unfrequently met with during the rainy season. It is now not uncommon to see passing down the road carts carrying eighty maunds of salt, and drawn by five pair of bullocks.

It is remarked that, below Cawnpore, and particularly below Futtehpore, the amount of traffic is trifling, compared with that between Cawnpore and Mynporie. Certainly, in as far as personal observation, unaided by registers, can afford the information, there is much more carriage traffic on the trunk road above Cawnpore than in any part downwards to Futtehpore, Allahabad, Benares, or Sherghutty.

51.

**REGISTRY OF TRAFFIC AT FOUR STATIONS ON THE ALLAHABAD
AND CAWNPORE ROAD,
FROM THE 1st TO 31st JANUARY, 1841, INCLUSIVE.**

	TRANSPORT.						TRAVELLING.				
	Hackeries.	Camels.	Bullocks, Pools, &c	Coolies.	Carriages.	Palkies.	Dhoolies.	Elephants.	Camels.	Horses.	Foot passen- gers at one station.
Daily average at each point of the road	11,057	4649	14,504	7080	3159	653	479	441	226	12,972	29,562
	964	375	117	114	33	52	77	35	36	104	953

*From a return by J. WELLER, Lieutenant Engineers,
late Superintendent of the Allahabad road.*

52.

TRAFFIC DURING ONE MONTH ON BURDWAN ROAD.

Burdwan, 26th January, 1842.

I have the pleasure to send you the paper you gave me in November last, filled up as correctly as it was possible to get it done, keeping in view the necessity for caution that was requisite to prevent any abuse of authority, or coercive measures being resorted to by those employed to ascertain their number. I cannot vouch for the accuracy of the statement, as numbers may have passed during the night, when it was impossible that the people I employed could attend to note them down, or that I could allow them to do so without running the risk of their becoming extortioners. The plan I have followed was this—the gate of my compound opens directly on to the military road, and I placed people there from early in the morning to late in the evening, to note down all that passed backward and forward, and the returns were brought to me every evening; and the post of inspection being close under my eye, any attempt at incorrect behaviour on the part of my people would have been brought immediately to my notice. I have endeavoured to give some information of the traffic there, and the people stationed on the road begged for some returns from the Dawk contractor, but they have not yet been sent to me, and I consider it useless delaying any longer for them. This return will, I hope, therefore answer the purpose required. Should those I expect from the Dawkmen be requisite, I will forward them when received. I have added the regiments (whose returns I was promised from the collector's offices that passed in December. It seemed impossible to distinguish the foot passenger) that were passing through from those who merely come to the station, or belonged to it without exposing them to the trouble and annoyance of being questioned, so that I refrained from having them reckoned. I have added also the number of loaded coolies and banghies to the list. Trusting this may be satisfactory, I remain, yours sincerely,

G. F. WING.

STATEMENT, showing the amount of the traffic on the military road, between Hooghly and Benares, at the station of E. Burdwan, during the month of December, 1841.

Numbers.

Bullock carts, with merchandise and produce of all sorts.....1,811

Pack bullocks, with merchandise and produce of all sorts	2,606
Camels and other beasts of burthen, with merchandise and produce of all sorts	189
Wheel carriages with passengers	84
Passengers by palkee	118
Passengers on horseback, &c.....	295
Passengers on foot impossible to ascertain with any degree of accuracy. Loaded coolies and banghys	778
Besides the above the following regiments passed through :—	
Second division of H. M. 62nd regiment, consisting of European officers and soldiers	371
Native ditto, women, children and camp followers.....	438
Elephants.....	22
Bullocks	264
25th regiment Native Infantry—in strength, including camp followers.....	2,070
18th regiment Native Infantry—European officers	15
Sepoys	1,000
Camp followers	800

53.

STATEMENT of imports in Calcutta, and other places in the Hoogly, from Benares and other stations above that city; together with the number of boats and passengers that have returned from thence and passed the Jungypore toll-office in the Bhaugetuttee river, from May 1, 1840, to April 30, 1841.

	Number of Boats.	Quantity Cargoes. Maunds.	Remarks.
Indigo seed	113	37,310	For factories in the Bhaugetuttee or Hooghly. Smuggled in Calcutta, &c.
Rock salt.....	8	2,762	
Saltpetre	1042	613,300	Hides, horns, stones, &c. Individuals returning from Benares and other places above that city. N.B. The Honorable Com- pany's opium is not included in the above statement, as the persons in charge of the de- spatches do not stop, nor give any particulars at this office
Sugar.....	2185	520,606	
Indigo	458	22,892	
Sundries.....	2400	624,000	
Passengers	6607	26,428	
Cotton.....	863	433,456	

54.

Statement of Exports from Calcutta and other Places on the River Hoogly to Benares and other Stations above that City, together with the number of Boats and Passengers for those places, that have passed the Jungypore Toll Office, in the Bhaugerutte river, from 1st May, 1810 to 30th April, 1841.

	Number of Boats.	Quantity of Cargoes.	Remarks.
Rice.....	185	96,418	Maunds.
Salt.....	5,810	1,834,650	Ditto.
Sundrie	2,400	644,000	{ Ditto, Europe silk and cotton goods, woolies, iron fence, &c.
Passengers.....	7,084	31,050	{ Individuals proceeding to Be- nares and other stations above that City.

(Signed)

M. LARRUTACTU.

Jungypore Toll Office, the 20th February, 1842.

55.

PRICE OF CONVEYANCE TO MIRZAPORE.—By land, for all descriptions of goods, five rupees per maund of 82lb.—By river, one rupee per maund for piece goods and metals. According to price of conveyance from Calcutta to Mirzapore is forty rupees for hackeries which carry twelve maunds.

56.

Memorandum of Cultivated Land in twenty-five Districts in the N. W. P. (exclusive of Bundelcund)

Acres 181,19,951
of this there are under sugar-cane..... 577,085

Memorandum of the Sugars that passed the Customs Line of the N. W. Provinces, during the first six months of

	1841.			1842.		
Agra.....	56,870	15	0½	95,561	27	11
Bundelcund and its dependencies..	83,872	18	8	2,10,661	16	11
Delhi	9,13,108	35	2	12,22,671	39	0
Mirzapore	91,797	12	12	2,12,800	36	0
Total maunds	11,45,797	27	5½	17,41,702	11	0

57.

The following letter is of importance, as conveying the impression of one of the most eminent English civil engineers upon the proposal to establish a Railway in the year 1840-41, at which period, however, the indisposition of the Government to afford that assistance and co-operation which have subsequently been conceded, prevented any active

measures being undertaken by the parties who had interested and exerted themselves in the promotion of this important object :—

London, 22nd February, 1841.

Sir,—I have carefully perused the documents you sent to me relative to the feasibility of establishing a Railway from Calcutta to Benares and Delhi.

The reports of Capt. Thomson and Lieut. Guthrie furnish very satisfactory information of the nature of the country through which the line would pass—the route having been surveyed by them some years ago for the purpose of making a road between the river Hoogly and Delhi; that survey, however, is too general to allow us to fix on the absolute heights of the more elevated ground, or on the gradients by which those heights would have to be attained. There is, however, I think, sufficient evidence for believing that a line may be found on which locomotive engines may be used, without having recourse to stationary power with inclined planes.

The crossings of the river Seane and Jumna appear from the description somewhat formidable, and a question will arise whether it may be necessary to raise the railways high enough to avoid the highest waters; and, if so, whether it be practicable to lessen the width of these rivers. The Jumna, it appears, in times of flood, rises from thirty-five to forty feet, and although this river is 1,400 yards broad, it does not seem likely that its width could with safety be materially reduced.

With the exception of these two rivers, and the passing of the Summit ridge, there does not appear to exist a single difficulty. The sketches of the country and the details furnished by Capts. Thomson and Drummond, shew that the works of art necessary for a railway are exceedingly light, and that the cost of those works in that country is very much below what it would be in this. Their estimates are very minute, and furnish good data on which to base an estimate for the construction of a Railway; but the gradients for the one road might not be applicable to the other, and the necessary cuttings, embankments, bridges, &c., for the Railway, would in all probability be much more extensive than those contemplated by the surveys to which I have alluded. Until a section be taken, shewing the undulations of the ground, these works cannot be ascertained, neither can the gradients be fixed, nor an estimate of the cost formed. With reference, therefore, to these matters, I feel bound to say, that the documents furnished do not enable me to form an opinion.

From your description of the navigation of the Ganges, there is no doubt that a Railway could successfully compete with it for all descriptions of traffic.

The absolute cost of conveying passengers and goods depends much on the number or quantity carried in each train. If the number, taking the case of passengers, be fifty or sixty (which is probably near the average on English railways), it is pretty clear that the cost PER PASSENGER will be greater than if the train contained 150. This greater number is probably never the average on the continental railways, and furnishes at once a reason for the difference, both in the charge and the cost of transport, in the two countries.

In your estimate of revenue expected on this Railway, it appears to me that you have not taken credit for one half what the statement of facts would have justified you in doing. Considering the amount of population, the immense number of pilgrims which frequent the cities on the line, the present amount of traffic in goods, the payments made by Government for the transmission of troops, together with the present inefficient means of communication, I am of opinion that a much larger amount of revenue than you have stated may reasonably be expected.

If this view be correct, a much larger expenditure in the construction of the Railway would be justified, and the remunerative charges would still be lower than you have stated them in your report.

Before, however, a very minute estimate of the advantages of this Railway can be made, it is absolutely necessary to have the ground levelled and correct sections made of the best line the country affords. It would be well also to collect information respecting the rivers Soane and Jumna—the depth, width, and velocity of the water at the various seasons, &c. Should these turn out, as from the documents already furnished there is every reason to believe they will, favorable to the construction of this Railway, you will, I think, be able to furnish such evidence of its advantages as will claim for it a large share of public support.

I am, Sir, your obedient servant,

JOSEPH LOCKE.

58.

EXTRACT FROM LETTERS ADDRESSED TO CALCUTTA PAPERS.

I must premise by an assertion that of all countries in the world none possesses so many advantages for a railroad as India.

Speed and certainty are of such primary importance in commerce that a small increase of expense is not a material object.

Certainty of supply must tend much to diminish the fluctuation of prices, and remove those alterations of glut and scarcity which are perpetually occurring in the markets, from various unforeseen causes. Every thing which tends to render the conveyance of goods certain must lessen their expense to the consumer, by diminishing the amount of dormant capital, and the necessity of keeping large stores in expensive warehouses; and, with a good system of conveyance, when a sudden call does take place the whole stock of the country becomes available.

What are the causes of the very great expenses attendant on railways in Europe? These—

1st. Parliamentary and law expenses.

2nd. The purchase of land and property at enormous sums.

3rd. Heavy embankments and difficult tunnels in consequence of such great irregularity of surface.

4th. The rate of labour.

In India, save the raising of embankments, there is not one of the above items that will impede the construction.

The objections that are generally raised to railways in India are—

Where will you get your iron? How is sufficient traffic to be brought on to the lines to pay?

Answer.—There are the same means of obtaining the materials here as elsewhere.

It would be most desirable to draw forth the resources of the country and let India make her own rails; but at first they must come from England, and, as dead weight in ships, their freight would be a trifle. Then, after landing, each successive mile of rails laid down would serve as the most effectual means of carrying forward the material for the advance, this remark has primary reference to my first scheme, which I shall presently lay down.

With regard to traffic, I will venture to say that if a line was opened in Oronooko traffic could be drawn on to it, so natural is it for all classes to avail themselves of those means which are the most certain, the most direct, the quickest, and, withal, the least troublesome.

It is not fair to judge of the present traffic on any single mode of transport as a scale by which to measure that which would be, were better communication provided, as in the case of a railway, were it in existence, the concentrated traffic of the present modes by land and water would be transferred to it. What advantages would not such means afford for the efficient transport of troops, stores, treasure, and officers to the Mofussil as well as for the better and more speedy convey-

anes of the mails, which are now, in this advanced age, wofully slow, and to the more rapid dispatch of which the business of every public office would be indebted for the more profitable and effectual discharge of its functions.

To the merchant, the planter, the agriculturalist, it would afford the command of any particular market in Calcutta, it might be their object to secure, with no deterioration of goods by the way, and far less insurance, risk, cost, and trouble than by the present uncertain mode through the means of the crazy country boat at present in use. To the residents in Upper India it would be a boon, enabling them to partake of European exports and obtaining supplies and goods of all kinds in a more satisfactory and cheaper manner than they can at present; in fact, it would place within their reach much that they are at present quite debarred from enjoying. The wealth and prosperity of India is limited to the amount of capital and enterprise applied to her improvement, and where can this be more effectual than by facilitating the communications, and the glorious result would tend to exalt the British power and name in the opinion of all classes of natives. It behoves then, since so universal are the benefits to be derived, every individual in every quarter to put a shoulder to the wheel in the cause.

The construction of good public roads was considered an object of such primary importance by the ancient Romans, that all the chief cities of their vast empire were connected by roads far superior to any that have been executed in later times and of a much more expensive kind than the best railroads. The Roman roads were made so firm and solid that they have not entirely yielded to the dilapidations of fifteen centuries. They rendered an intercourse with the most distant provinces easy at all times, and rapid when occasion required. The roads ran nearly in direct lines from city to city, and have been the subject of universal astonishment and admiration. Natural obstructions were removed or overcome by the efforts of labour or art, whether they consisted of marshes, lakes, rivers, or mountains.

In that career of improvement which has distinguished the last thirty years beyond, perhaps, any previous history of the world, and in which the sum of the vast ameliorations effected, in all that relates to the condition of man, is not less striking than the rapidity with which their details have followed upon each other—one important lesson seems to have been in an especial degree impressed upon those engaged in the pursuits of industry, and upon the commercial and manufacturing classes in particular, they have been effectually taught to appreciate the value of time, and to apply to its use a degree of right and judicious economy of which the past affords example, a lesson which is daily illustrated by the vast expenditure upon works affording facilities in accelerating intercourse, since it is universally felt that distances are virtually shortened in the precise ratio in which the time occupied in travelling them is abridged.

It has been well and truly observed, that "The characteristic of the present age is the Appreciation of Time."

In looking back through the vista of centuries and endeavouring to pierce the mist of tradition, we are led to conclude that the formation of roads must have been amongst the earliest rudiments of civilisation, but until science or at least until system, was applied to their construction, it is evident (from the traces of the simple paths of comparatively modern times), that the merest tracks sufficed to satisfy our ancestors, who had not yet learnt the "Value of time."

It is far beyond the possibility of any mind to calculate the blessings and advantages which the statesman and capitalist combined, would confer on India, her natives, and European residents of all classes, by the practical application of the above mentioned axiom; for truly it may be said, even in these enlightened times, that India has scarcely learned the value of time. Is our sojourn on earth so long, that we may patiently wait for a season which will bring the much to be desired but apparently still dormant spirit of improvement with it? Or should we

not at once possess ourselves of the hitherto hidden and boundless resources of the country, and in this our day, contribute all that is in our power for the amelioration of the soil and its inhabitants, from which we draw our sustenance, contributing at the same time to exalt the glory of England by the exhibition of her power and pre-eminence.

As a proof that without the intervention of British enterprise and British science the soil might remain a desert for ever, glance at the state of communication throughout India at this moment, and save in a few instances where roads have been opened by Government, what is it ?

Little more than a path upon naturally firm earth ; marshy grounds avoided, the fords of the rivers, are alone resorted to, and irregularities of surface, or inclination of the road, or its circuitous course, are considered of little consequence to the pedestrian, or even to the mounted traveller. The path generally traced from one distant wigwam to another, has become the track from village to village, and at length serves as the road from town to town, or even to the capital. The line once traced out, indolence and habit seem to have prevented any great exertion to improve or repair, beyond what was indispensably necessary, even after the invention of wheeled carriages. The system of following the ancient course of roads seems to have been pertinaciously adhered to in all countries, until the advance of civilization, and the wants of the community, produced improvement, and gave rise to the calling of the road maker, and ultimately to the profession of the engineer.

If further stimulus to the undertaking be wanting, let it be borne in mind that the first elements of the amelioration of internal improvement, would be the finding employment for thousands of poor, enabling them thus to work out the bettering of their own condition.

This has formed a remarkable feature of England since mendicity was pronounced a crime ; she has, by the system followed out, proved her wisdom, and proclaimed her prosperity.

England possesses twenty-nine principal railroads and 108 branches, the former from 140 to 200 miles in length, the latter averaging thirty, with others in progress. These have cost not less than from £16,000 to £25,000 per mile.

In France, principally constructed by English engineers, are sixteen lines, the most important being between Basle and Strasburg, and the Paris and Orleans line, the expenditure has averaged £19,000, per mile.

The United States have already more than 5,000 miles of railway, New York alone possessing 800 miles.

In Germany are twenty miles already, and more in progress.

The Prussian and German Confederation will possess 3,900 miles.

Austria is forming five principal lines from Petersburg to Varsova, Odessa, and Moscow, and from Moscow to Varsova and Odessa.

Belgium has six lines.

Then let me ask why has not India one ?

"I pause for a reply."

I am, yours faithfully,

B-poor, 11th Feb., 1843.

FERRUM.

59.

COPY OF A LETTER FROM C. VIGNOLES, ESQ.

TO R. MACDONALD STEPHENSON, Esq.

4, Trafalgar Square, London, 23rd November, 1844.

Sir—I have carefully perused your papers, and examined the documents which accompany them, relative to the proposed establishment of a Company for the introduction of Railways in India generally, and for at once commencing operations upon the great line between the capital of Bengal and Mirzapore. My

opinion upon the subject is not based exclusively upon the evidence at present before me, as you are aware that I have already given considerable attention to the matter, and that I have collected much practical information upon the subject, which I am gratified to be enabled to bring to bear upon the consideration of it in the present instance.

I have no hesitation in assuring you that the results of my own investigations fully bear out and confirm the statement and references contained in your Report, and although without personal observation, or a complete and accurate survey of the country, I should be unable to pronounce with confidence the cost per mile of Railways in India generally, I can state without hesitation, my conviction that India is, without exception, the most favourable country for the introduction of such works, of any with which I am acquainted, and that the average expense of a Railway will not, at the outside, exceed one-third, and probably not one-fourth of the amount that has been required for the same purpose in this country.

I consider that the line selected as the first work to be undertaken is unexceptionable, on account of the remarkably level character of the country through which it passes, and as offering no engineering difficulties, while the trade appears from the returns to be such as to warrant the expectation of a very ample remuneration for the outlay.

I am, Sir, your faithful servant,

CHARLES VIGNOLES, Civil Engineer.

60.

EXTRACTS OF LETTERS FROM COL. I. R. OUSELEY, POLITICAL AGENT AT CHOTA NAGPORE.

I have often heard from my friends in the Nerbudda Valley, where I have held charge of the Hoahungabad, &c. districts, from 1823 to the end of 1838. They assured me that they would assist, i. e. take shares. I think I have influence enough among them to take a great many, but I have now nothing official to do with them, and am rather remotely situated for helping in carrying out this magnificent scheme.

The rapid advances made in North America arose chiefly from the adoption of railways.

The natives can appreciate as well, and better in some cases, as we can, the advantages of rapidity of transport. Bunjana bullocks travel at a rate of from six to eight miles per diem; much loss is experienced from wetting, rotting, fire, robbery, and delay from death of bullocks.

It would be just as well to get a list of those of our countrymen who would take shares in this grand object, to shew that we are not altogether luke-warm on such an occasion. For my own part, the dreamy hopes of ten years are about to be realized.

You should visit the country—ascertain the capabilities,—and as practical knowledge enables you to form a just opinion on the subject, the Government would not allow of your being a sufferer in a pecuniary point of view, for from your opinion the most important changes in every way must result.

I shall ever be most happy to aid in any way in such an undertaking, and glad to afford you in particular, every information I have. I shall, I hope, be in Calcutta in February, when perhaps you may be back."

My expectation will now be realized, and India will assume an aspect of renovated power. Her value will then shine forth, and those who consult her interests must rejoice.

14.
which
the
era-
My

I N D E X.

NO.		PAGE
1	Report	5
2	Extract from the Bengal Government Gazette of 24th August, 1844....	21
3	Copy of Letter addressed to several of the principal Mercantile Houses in Calcutta, relative to the introduction of Railways into India.....	23
4	Copy of Letter from Messrs. Colvin, Ainslie, Cowie, & Co., dated 24th Aug., 1844.....	24
5	Copy of Letter from Geo. Ashburner, Esq. (Messrs. Macintyre and Co.), dated 2nd Sept., 1844.....	25
<i>Copies of Letters from the following :—</i>		
6	Messrs. Gillanders, Arbuthnot, and Co., dated 27th Aug., 1844	26
7	W. Wildrake Kettlewell, Esq. (Messrs. Leach and Kettlewell), dated 28th Aug., 1844	28
8	Messrs. Livingstone, Syers, and Co., dated 28th Aug., 1844.....	30
9	Messrs. Allan, Deffell and Co., dated 31st Aug., 1844.....	30
10	Messrs. Cockerell and Co., dated 31st Aug., 1844	31
11	C. J. Richards, Esq. (Messrs. Gisborne and Co.), dated 28th Aug., 1844	32
12	Copy of Letter to J. B. Higginson, Esq., 2nd Sept., 1844	32
13	J. B. Higginson, Esq., Mirzapore, dated 10th Sept., 1844, in Reply to Enquiries	33
14	William Limond, Esq., Secretary to the Chamber of Commerce, dated 14th Sept., 1844	34
15	H. Burkinyoung, Esq., Master of the Trades' Association, dated 7th Sept., 1844	34
16	Baboo Mutty Loll Seal, dated 26th Aug., 1844	35
17	Messrs. Kelsall and Ghose, dated 14th Sept., 1844	35
18	Colonel Warren, C.B., Fort Major, dated 17th Sept. 1844.....	35
19	Capt. Henry Goodwyn, Garrison Engineer and Civil Architect, Superintendent of Suspension Bridge, and Wrought Iron Roofing Works, dated 12th August, 1844.....	35
20	Ditto, ditto, ditto, 8th Sept. 1844.....	35

NO.	PAGE
21	Capt. Greene, Secretary to the Military Board, dated 17th Sept. 1844.. 40
22	Capt. A. S. Waugh, Surveyor General of India, dated 10th August, 1844 40
23	Copy of Letter to S. Ashburner, Esq., dated Sept. 2, 1844 44
24	Samuel Ashburner, Esq., Civil Engineer, dated Sept. 9, 1844..... 44
25	Lient. Ch. Handfield, 3d Buffs, dated Sept. 9, 1844 45
26	Extract of a Letter to Colonel Ouseley, Agent to the Governor General at Chota Nagpore, from Syed Abdoollah, dated Benares, 28th August, 1843 46
27	E. Wilkinson, Esq., Supervisor of Customs, dated 4th Sept. 1844..... 46
28	Baboo Mutty Loll Seal, dated 1st Sept. 1844, Table of Minimum ascer- tained Traffic 47
29	R. J. Chambers, Esq., respecting the ascertained Trade to Mirzapore, dated 10th Sept. 1844 47
30	W. Blunt, Esq., relative to Salt Trade with Burdwan, dated 31st August 1844..... 48
31	W. Theobald, Esq., respecting Coal Trade of Burdwan, dated 6th August, 1844 48
32	Dr. J. McClelland, Member and Secretary of the Coal Committee, dated 13th Sept. 1844 49
33	J. Mackintosh, (Messrs. Burn and Co.), respecting cost of Materials, and References to Specimens of Timber sent, dated 29d August, 1844, and 16th Sept. 1844.....50-51
34	
35	Copy of Letter from R. N.C. Hamilton, Esq., dated Indore, 5th Sept., upon the subject of Railway Communication in India 52
36	Baboo Dwarkanauth Tagore—Replies to Enquiries respecting Burdwan Coal Trade, dated 3rd August, 1844 53
37	Capt. J. Anderson, Bengal Engineers, Superintendent of Roads, dated 4th September, 1844 54
38	Extract from Notes taken in 1841, respecting Timber, Fire-wood, Work- ing Mechanics, and Land 5
39	Extract of a Letter from J. Erskine, Esq., 1841, respecting cost of Burd- wan Coals 59
40	Extract of a Letter from J. Erskine, Esq., 1841, in reply to Enquiries respecting Trade on Burdwan Road 60
41	Extract from Report of Rajmahal Committee relative to the Cost of Excavation in India 61
42	Extract from Letter of J. Shaw, Esq., Sept. 1841, respecting Traffic of Burdwan 61
43	Extract from a Letter in reply to Queries respecting Goods sent by Go- vernment Steamers, 10th Nov. 1841, by Capt. Johnstone, Comptroller of Steam Vessels..... 63
44	Extract of a Letter from Ram Coomul Sin, 1841, respecting Cost of Conveyance in India 64
45	Extract from Report of Military Board on Public Works, 1837 65
46	Replies to Enquiries respecting Trade between Hoogly and Burdwan, by Mr. Collector of 65

NO.	PAGE.
47	Extract from a Communication relative to Cost of Carriage of Sugar and Supply of Coals 67
48	Abstracts of the Return of Traffic over the Annabad Bridge during the year 1837-8, by Capt. Thompson, Bengal Engineers, Superintendent of Roads..... 6
49	Replies to Enquiries furnished by several Merchants in the Upper Provinces, 3rd December, 1844, to Manackjee Rustomjee, Esq..... 66
50	Extract from Major Smith's Report upon the great Trunk Road between Allahabad and Cawnpore, 1st May, 1840 69
51	Register of Traffic over Allahabad and Cawnpore Road, by Capt. Weller, Bengal Engineers, Superintendent of Roads 70
52	Extract of a Letter from Mr. G. F. Wing, dated Burdwan, 26th Jan., 1842, with a return of the Monthly Traffic 70
53	Official Returns of Traffic from Benares to Calcutta by the Bhagureetee River during year 1840-41, by the Collector at the Jungypore Toll Office, 20th Feb. 1842 71
54	Official Returns of Traffic from Calcutta to Benares, year 1840-41 72
55	Extract from Letters respecting Cost of Transport from Calcutta to Mirzapore..... 72
56	Land in N.W. Provinces under Sugar Cultivation, with Return of Sugars during First Six Months of 1841 and 1842 72
57	Copy of a Letter from Joseph Locke, Esq., Civil Engineer, dated 22nd Feb., 1841, relative to the formation of a Line of Railway from Calcutta to the North-west Provinces..... 72
58	Extract from Letters addressed to the <i>Englishman</i> Newspaper on the 11th Feb., 1848, under the signature of "Ferrum" 74
59	Copy of Letter from Charles Vignoles, Esq., Civil Engineer 76
60	Extracts of Letters from Col. I. R. Ouseley, political agent at Chota Nagpore..... 77





3 9015 01651 1183



2000 11 15



