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INDIAN RAILWAYS.

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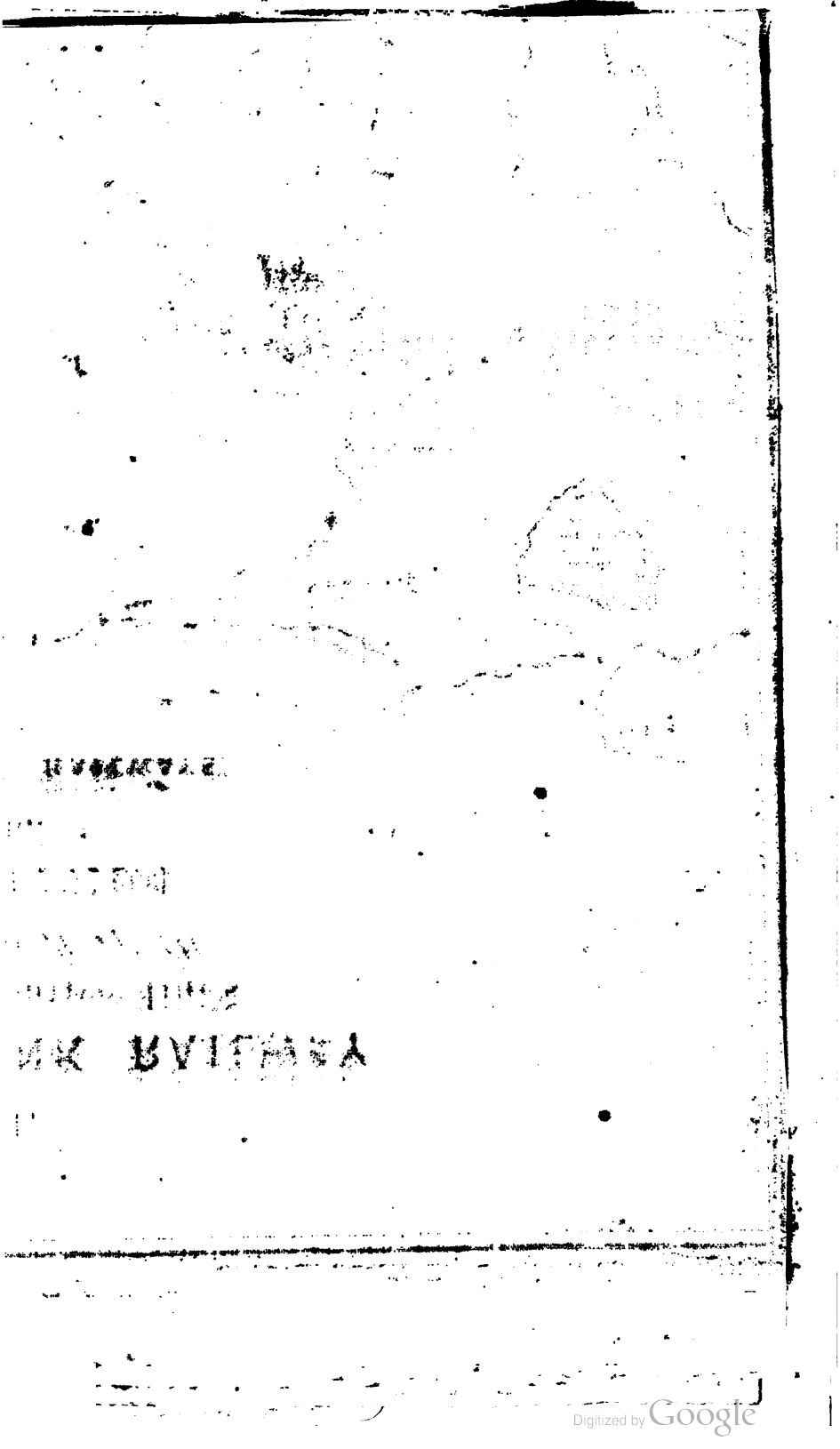
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INDIAN RAILWAYS

AND

THEIR PROBABLE RESULTS,

WITH MAPS AND

An Appendix,

CONTAINING STATISTICS OF INTERNAL AND EXTERNAL

COMMERCE OF INDIA,

BY

AN OLD INDIAN POSTMASTER.

THIRD EDITION.

"It is to India, that the chief enterprise of British commerce and civilization should be directed by an intelligent legislature.—*Blackwood's Magazine.*

LONDON:

T. C. NEWBY; P. RICHARDSON, Cornhill;
Edinburgh, OLIVER & BOYD; Liverpool, DEIGHTON.

1848.

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"Looking to our Indian empire, we cannot but be struck with the singular facilities which—in climate, soil, and population—it presents to the commerce of Great Britain."—*Economist.*

"The actual expense incurred in the transit of the cotton (of Central India to the Coast) can hardly be less on the average of the year than 1d. per lb. upon an article of which the first cost in the market did not probably exceed 1½ per lb."—*Report of Government Commission on the Cultivation of Cotton in India.*

"The duty which Government owes to the millions of its subjects who would experience from the completion of these projects (railways) an increase of happiness almost beyond the conception of Englishmen, is not only gladdened by the prospect of simultaneous profit, but is lightened by the extraordinary facilities awaiting its performance."

"The guarantee of a MINIMUM dividend is nothing, in fact, but raising a loan at a given rate of interest for the purpose of some beneficial and lucrative undertaking, and amongst the many millions which we have raised, it would be very difficult to find one of which the purpose was so promising as this."—*Leading Article* "TIMES."

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TO THE HONOURABLE

THE COURT OF DIRECTORS

OF

THE EAST INDIA COMPANY,

As the guardians of the British Empire in the East, this brochure on the political, military, and commercial importance of railway communication, as affecting the present position, and future prospects of that Empire, is appropriately and with much deference dedicated,

By their most obedient, humble servant,

THE AUTHOR.

January, 1848.

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PREFACE.

TO

THE THIRD EDITION.

SINCE the second edition of this brochure was given to the public, nearly twelve months have elapsed, and the altered aspect of affairs has of necessity led to a corresponding alteration in the arrangement of the subject matter of the following pages.

The difference between the present edition and its predecessors, may be stated in a few words; the introductory sections have been altered by leaving out what was deemed superfluous, and substituting several important additions to the text. The entire arrangement of the other sections has been simplified, by excluding what related to abortive schemes,* so that instead of

* "The Direct Bombay and Madras," the "Northern and Eastern" &c.

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the comparative merits of rival projects, the wants and capabilities of the different presidencies are now briefly described—*e. g.* the sections devoted to the "East Indian line" the "Great Western of Bengal" and to "suggestions as to the proper mode of introducing the railway system into India" are now arranged under the last named head, "Bengal Proper" and the "N. W. Provinces." The original text is greatly abridged in all these, and nothing is added to it, but copious notes are appended, corroborative of the views formerly enunciated. In like manner the sections appropriated to the "Madras Railway" and the "Great Indian Peninsula" are now headed respectively "Madras" and "Bombay" the text of the former is unaltered, and that of the latter is slightly compressed; but the Report of Mr. Simms is added to the former, that of Mr. Robert Stephenson, and other important matter to the latter: additions have been made to the appendix, and altogether the little work has undergone a thorough and careful revision. The writer gives, what he conceives to be, a fair and comprehensive digest of Indian Railways and their probable results, with the respective merits and claims of Bengal, Madras, and Bombay, the two latter being allowed to state their case more "*in extenso*;" the published Report of the Railway Commission, and the recent public meetings, having brought the merits of the chief presidency more generally into notice.*

* Those desirous of further information are referred to the *Reports* of the Railway Companies, and the *Reports* and *Letters* upon Proposed Railways in India, ordered, by the House of Commons, to be printed 15th. Feb. and 5th. March 1847.

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Much additional light has been thrown on the introduction of railroads into India by the publication of luminous reports and other documents emanating from the promoters of the more legitimate projects. In fact, suspense and conjecture have been gradually giving way before a brightening obscurity, and what was deemed, a short while ago, the dream of the enthusiast, may now be regarded as *un fait accompli*, so far as reliance is to be placed, in the dictum of science and in the matured and deliberate conclusions of the authorities. Yet the obscurity is only brightening, the subject being still shrouded under the veil of ignorance, prejudice and timidity. The apathetic ignorance regarding India so general as to be all but universal, and so much to be deplored, is incidentally alluded to in the following extract from the leading article of the *Times*, of the 14th of June last. —"It is well known that a line between any two towns in Great Britain, selected with common judgment, and constructed with common skill, will yield a certain and infallible profit, over and above any honest and legitimate expenses. It is not well known that such results will follow in India. It is very true, that any person acquainted, through study or service, with the history and statistics of that empire, must be convinced that all the financial and social improvements consequent upon railways at home, would be multiplied tenfold on their introduction into Hindostan; but how far or wide is such information diffused? Six years ago, one of our most accomplished writers and speakers, at this moment a member of HER MAJESTY'S Cabinet, avowed his conviction, that not one in ten of our most

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highly educated gentlemen had the faintest conception of those incidents of British Indian history, which would correspond with the victories of ALFRED or the landing of the CONQUEROR in our domestic annals. But for ten of such persons who may be acquainted with the deeds of SIR HECTOR MUNRO, or who might haply track the territorial history of the Subahdarree of Bengal, or sketch the dynastical fortunes of Oude, could one be found who could describe the plans or the objects of the great Ganges canal, the country to be traversed between Monghir and Mirzapoor, the relative fertilities of the Circars and Candeish, the capabilities of the Cavery, or the wants of the Deccan! Nor can imagination here supply the place of knowledge. Though India is too remote to be appreciated, it is too familiar to be dazzling. It is not a newly-found El Dorado. The old fables of gold and rubies have vanished under the scrutiny and experience of a century, and the realities of unbounded resources and prodigious productiveness, have not yet supplied the void. There may be no diamonds at Golconda, but there is the worth of a ship-load of diamonds, in the cotton fields of the Deccan."

The feelings of prejudice and timidity, result inevitably from unacquaintance with the greatest and most magnificent of our imperial dependencies, her history, her people, and her resources. Hence it becomes the duty of all who would uphold England in her commercial and manufacturing pre-eminence, and would act with enlightened justice to India, to contribute their quota to the lamp of knowledge, before whose

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penetrating beam the misty veil will dissolve, the views enunciated by men of science, experience and research will be listened to, and the facts, demonstrating resources (of inestimable value to this country,) so vast as to be almost incredible, will be believed.

There is little desire in the writer; to base any of his propositions on presumptious, or to attach undue importance to any opinion or preconceived notion of his own, although he can speak from considerable personal acquaintance with the country; on the contrary, it has been his desire to place facts before the public, drawn either from official documents, published or unpublished, or from disinterested and unprejudiced parties, where practicable in their own words: and when he speaks of his own knowledge and observation, corroborative evidence has been added, especially in this edition, so that the reader may judge if the inference drawn be borne out by the data presented for consideration; and it is most gratifying to him to observe that, although last year he was termed "an enthusiastic advocate for railways in India" that this year, he is in a position to prove from official statements, put forth by those with whom he had no connexion, that his enthusiasm was of so moderate a character, that he has in many instances understated the merits of his case, and in no instance, that he is aware of, exaggerated those merits. He was also rallied by a respectable paper connected with India as indulging in "views, of Oriental magnificence," because he advocated in June, 1846, in his first edition, that the Government should give a guarantee of 5 per cent. The same paper now sees nothing more in a 5 per cent. guarantee

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"than what might have been expected from a liberal and enlightened government." Those who from their connexion with India, ought to have given some degree of attention to a subject of such gravity, found fault with the peculiarities of his views, because in the first instance he desired, as he still desires, to use the means of transit which Providence has provided for the country in connexion with railroads. For example he desired to see railroads *commenced* where the traffic was great, where, for several hundred miles, no physical obstacle presented itself, and where the river transit was either altogether wanting, or extremely imperfect and dangerous, while he desired to postpone the solution of engineering problems which, from their very novelty, might cast a stumbling-block of difficulty, or doubt on the general merits of the question at issue. The inconsiderate reply to this was "talk of break of gauge, here would be delays and transhipments, we must have the railway, the whole railway, and nothing but the railway, and that immediately!"* This would be all

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* "In regard to the great line to connect the seat of Government with the extreme North-West, the author's opinions are peculiar. He would construct the Northern part of the line before the Southern, arguing that the Ganges, as far as it is navigable, supplies the means of communication, and that it is where this accommodation ceases that a railroad is more especially wanted. If we were to have only half the line, this mode of reasoning would be worth something, but as we mean to have the whole, and very speedily, we cannot but regard Calcutta as the most convenient point of commencement."

ALLEN's *Indian Mail* August 13th. 1846.

"We have little doubt that the preference given to the Mirzapore line by the Railway Commissioners, will be confirmed by the Supreme Government and the Court of Directors; for

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very well for an Aladin and his wonderful lamp, but

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we can scarcely imagine that those bodies will participate in the "Old Postmaster's"* weakness in favour of the intermediate river trip from Rajmahal to Allahabad on the way from the Presidency to the North Western frontier."—*Morning Herald*, November 14th. 1846.

The "Old Postmaster's" weakness was, and is, in favour of the Railway System being *commenced* in connection with river transit, but those parties who last year thought him wrong, because he differed from authorities, will this year by a parity of reasoning think him right, if it be found that his suggestions have been approved of, as shewn by the following extracts placed in juxta-position :—

An epitome of his views as expressed in a letter by the "Old Indian Postmaster" to the Editor of the Morning Herald under date 10th. November 1846.

"Should the line you sayI advocate be postponed, viz, that to Rajmahl, and the concession of two sections of the East Indian trunk line be accorded, one in Lower India, commencing at Calcutta, and the other in Upper India, commencing at Allahabad, leaving the intermediate portion, which comprises all the difficulties, for re-survey, I shall in a great measure have achieved my object, i.e, to have the railway system commenced where the present means of transit are most defective, where there is a great existing traffic, a dense population and few physical obstacles to surmount."
Mor. Herald Nov. 14, 1846.

What has finally been sanctioned by the India House is proved by the following extract from the concession recently granted.

"The East Indian Railway Company is to undertake to construct in the first instance, and to keep up and work when constructed, two sections of their proposed line of railway between Calcutta and the North-Western provinces of India. One section in Upper and the other in Lower India." (Commencing, no doubt, at Allahabad & and Calcutta respectively.)

Report of the Directors of the East Indian Railway Company as given in the Morning Herald and other papers of August 7th. 1847.

* One word of explanation to the English reader, regarding the office of Postmaster in India may not be out of place. Immediately under the Postmaster General there are Deputy Post Masters to divisions, or districts of Country having subordinate Postmasters at all the towns, and stations

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money and skilled labour in these days, even in the East, are hard to be got realities.

"In England, when we discussed the gauge question, we had been accustomed to travel at the rate of twenty-five miles an hour by railway, and a break of gauge promised us nothing but discomfort and delay, without any equivalent; but let it be borne in mind, that any means which will enable people or goods to travel at a better rate than ten miles per diem, would be a step in advance in India.

"Railroads in India, where the rivers cease to be navigable, assisted by steamers where the rivers are always open, and the broad rivers crossed by floating bridges,*

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* The Portsmouth Floating Bridge is 70 feet in length and 60 feet in breadth; and will hold on each side, besides passengers, two rows of carriages, 70 feet long. She is impelled by two engines, twenty-horse power each; the cylinders being 18 inches in diameter, and the length of the stroke 3 feet. The average rate of the engines will be about 30 strokes per minute; and the average speed about 350 feet per minute, so that she will perform the passage (2,200 feet) in about seven minutes. She only draws, with all her machinery on board, 2 feet 9 inches; and 50 tons additional weight will only sink her 4 inches.—See *Hand-Book of Art for* 1842.

subject to their jurisdiction. These latter attend to the receipt and transmission of the mails, the dispatch and distribution of letters and parcel traffic, the Government Dák or posting establishments, and forwarding expresses, reporting monthly to the Deputy Postmaster of the District, who again makes his report to the Postmaster General, and to whom alone he is amenable. The Deputy Postmaster is almost always a military or civil servant of Government. The writer held the office as an extra appointment both in Lower and in Upper India; in the latter the chief judge of the district preceded him, and in the adjoining districts a Deputy Adjutant General of Division, and a Major of Brigade respectively performed the duties. The Deputy Postmaster generally contracts with Government for carrying the mails through his district, he has the power of franking on the public service all over India, and appoints and removes all the Postmasters in his district.

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would be a prodigious improvement in travelling in that country, so far as speed, safety, economy, and comfort are concerned."*

The introduction of any measure, however beneficent, involving so many fundamental changes in the distribution of labour and capital, new to the people, and so unlike anything that they have been accustomed to, must, if success, at once safe and rapid, be desiderated, however paradoxical it may appear, be introduced in a cautious, well organized, and systematic manner, letting the future progress of the measure have a reference to the results obtained, or to the encouragement held out; besides this, and the impolicy of raising suddenly so large an amount of capital, it is of obvious importance to educate the natives of the country for the several kinds of labour and the working of machinery, both of which are of necessity new to them.

As to what may be achieved by native workmen, the gorgeous Mausoleums† and Palaces, the numerous Caravanserais, Forts and other public monuments of ingen-

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* *Second Edition of a Letter by the Author of "Indian Railways."*—SMITH, ELDER, & Co.

† The Taj Muhal at Agra is famed alike for beauty of material and design. It is of large size and built entirely of white marble. The Central Hall, or principal apartment, in which are the Cenotaphs, is of noble proportions and lined throughout with pure white marble, which is either most beautifully carved in bold relief, or inlaid with precious stones in the *pietra dura* style for which Florence is so famous, and which the writer has not seen surpassed, if equalled, in Italy. This latter portion of their work an Italian taught the natives, but in other respects, both as to general design and detail, the building is their own.

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uity and skill, sufficiently demonstrate that the native artisan of India only requires to be trained to enable him to effect whatever has been accomplished by his European brethren. These works were executed before we assumed the government of the country, and under our own auspices they have made roads, built bridges, raised collosal embankments, cut canals, and erected magnificent buildings,* in the European style to the entire satisfaction of our Engineers and the authorities.

Of their aptitude in accommodating themselves to entirely new labour, and acquiring the requisite knowledge of machinery, we have ample proof in the capacity and expertness of the native engineers in the Calcutta Mint, where they have been for years employed in working the

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* To select one out of many examples:—the Palace of the Newab at Moorshedabad, erected ten years ago from the design and under the immediate superintendence of Major General Mc Leod. It is an oblong and lofty parallelogram of the Grecian Doric order about 450 feet in length by 200 in breadth, containing three tiers of apartments enclosing two square courts. There are two fronts each having a noble portico, one of these is approached by a lofty flight of steps leading to the state apartments, and underneath there is a carriage-way to a private entrance. In the interior of the building there is a circular hall, adorned by a singularly handsome dome. The quality of the materials, the strength of the building, and the beauty, and finish of its external and internal ornaments, are well known to all sojourners in the East. The building cost about £80,000, and would have required in this country about £300,000. With the exception of General Mc Leod, no European either planned or executed any portion of the work. A large and beautiful model of the palace, also made by natives, was presented to the Crown by the distinguished Architect, and may now be seen at Hampton Court.

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Steam Machinery of that most magnificent establishment in those attached to the several steam engines in the Burdwan coal district,* and in other instances which might be adduced.†

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* "There are on the different estates six steam-engines, aggregating seventy-horse power, with winding and pumping machinery complete; also workshops and implements for the engineering establishments, working coal from twenty different shafts, and running at present at the rate of twenty-three lacs of maunds per annum=85,185 tons 3 cwt.; and capable, if required, of producing double that quantity.

"The coal-beds of the Company, extend over a space of 30 miles; the vein at present worked, is from 70 to 100 feet below the surface, varying in thickness from 9 to 11 feet, and the means of supply are believed to be almost inexhaustible. The quantity of coal hitherto raised under separate managements, although in a great degree regulated by the demand, has always been in excess of it, and it has been ascertained by experience, that forty lacs of maunds=148,148 tons 1 cwt., can easily be raised from the shafts now in operation; while the supply can be carried to any extent by sinking new ones if necessary.

"The Bengal Coal Company expect to bring to Calcutta, eighteen lacs of maunds=66,666 tons 6 cwt. of coal, at a much smaller cost than has ever before been done, owing to the great saving effected by the junction of the concerns—the prevention of litigation, and the reduction of establishments. They have contracts from Government and private individuals for nearly twelve lacs of maunds=44,444 tons 9 cwt., about three lacs=11,111 tons 1cwt. more are taken by brick burners, while the surplus will supply occasional purchases. The consumption of all kinds of coal in Calcutta has hitherto been about eighteen lacs of maunds=66,666 tons 6 cwt., a year; and there can be no doubt that the rapid extension of the use

† Mr. A. S. Ayrton, of Bombay, in a letter to the Chairman of the Great Indian Peninsula Railway Company, mentions that one of the Steam-boats plying between Bombay and Surat is managed by one English engineer only, at a Salary of 150 rupees (£15) per mensem, with the assistance of the natives of the country.

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But it ought to be borne in mind that experience proves, both in this country and elsewhere, that the amount of expenditure is always materially affected by, and bears a relation to, the amount of pressure applied to hasten the execution of works of a novel character.

An attempt was made to affix the stigma of partizanship to the author of "Indian Railways" but as he had no connection, and has not now, with the project indicated, no greater compliment could have been paid to his impartiality. The last assailant who stepped forward to do his devoir, having views of his own, appealed to maps and compasses, forgetting that a map of India only indicating its larger rivers, and from which hills—loftier than Cadir Idris—are excluded is somewhat inferior as a guide to personal acquaintance with the country; but the assailant encountering no physical obstacle proved himself right to his own satisfaction, and the "Old Indian Postmaster" wrong by authority.

Since the above was written the Calcutta Review for June 1847 has been perused, the pleasantry of the reviewer on making the discovery that an estimate given in one part of this book for one line, did not correspond

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of steam in this country, whether applied to navigation or manufactures, must in a very short time increase the quantity of coal required, to double the present amount."

"Mr. Williams, the mining geologist, employed by the Bengal Government to survey the Burdwan district, discovered a deposit of coal, which he reported as equal in quality to the best found in the coal basins of this country. It afterwards appeared, that this valuable deposit was on the property of the Bengal Coal Company."*

* *Second Edition of a Letter by the Author of "Indian Railways"*—SMITH, ELDER, *& Co.*

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with an estimate given in another part for another line, is reciprocated, and would have been enjoyed *sub silentio* had not the same paragraph been disfigured with rather a serious mis-statement.

A reputed competent authority, a Military Engineer, had in 1843 estimated the cost of a railway from Calcutta to Rajmahl at £4,400 per mile, (exclusive of several items *) which Mr. Simms, in his last and still unpublished Report, objects to in a very elaborate manner: "To take," says the Reviewer, "so much trouble to refute so absurd an estimate,† we should have pronounced supere-

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* Vide page 70 of this work.

† Not a bit more absurd than the still more recent estimates for the East Indian, Great Indian Peninsula and others, as may be seen by referring to page 67, all of which were just as much adopted by the "Old Indian Postmaster" as the £4,400 per mile was by the author of the "Letter to the shareholders." In both instances as might have been seen they are mere quotations. The Military Engineer officer published his report in the Calcutta papers so far back as March 1843, and gave his estimate, of £4,400 per mile for a line from Calcutta to Rajmahl, and up the Gangetic valley, evidently in an incomplete state, from a number of items having been omitted, indeed in para. 19 of his report the Military Engineer says, "allowing for contingencies &c. Rs. 50,000 a mile." And if the Reviewer had read that report he would have seen that it contained the important suggestion of making the large bridges of the railroad broad enough to give accommodation to the common traffic of the country, the whole credit of which he gives, in a preceding portion of the article, to the Railway Commission; but there is no originality in the idea, except the application of it to India. To have railway bridges with common roadways has been for years adopted in the Government lines in Belgium, which the writer has traversed; for instance:—The Val-Benoit bridge over the Meuse from the Val-Benoit to the Bac-in-Pot shore, on which a toll is levied for Government—the bridge over the Ourthe at Chénée, and a Viaduct which joins the bridge have each a roadway for carriage and foot-passengers.

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rogatory,- but both the "Old Indian Postmaster," as Mr. Simms probably was aware, and the author of the "Letter to the Shareholders," dwell on the estimate alluded to, the latter literally adopting it;* the former quoting it as good, as far as it goes, but adding £2,100

The two latter were commenced in 1840,*—besides other examples which might be named. The Military Engineer is a perfect stranger to the "Old Indian Postmaster," except by name. The undisguised asperity of the Calcutta Review can do no harm in India. It is but fair, however, to let it be known here, how the gentleman in question stands in the estimation of those really able to say whether he is a "competent authority" in his profession or not. The following is an extract from a Calcutta paper of March, 1843:—

"REPORT ON THE APPLICATION OF RAILWAY COMMUNICATION IN INDIA."

"We gladly take advantage of the interest which Railways for India have excited to lay before our readers, a plan for a railroad which was recently submitted to the Court of Directors, by a young and zealous officer in their service on this establishment, whose talents were so highly appreciated by Col. Paisly, that when on a recent occasion the Senate of Hamburgh applied to him for an Engineer to blow up a vessel which obstructed the navigation of the Elbe, the author of this plan was selected for that employment. Just at that time, however, the news of our disaster in Affghanistan, reached England, and every officer on furlough was hurried to India, to prevent the sack of Calcutta by Akbar Khan and his mountaineers. He was thus deprived of the opportunity of distinguishing himself."

Captain Western, the officer alluded to, was subsequently selected, by the Government of India, to form the Railway Commission, in conjunction with Captain Boileau and Mr. Simms.—O.I.P.

+ *Vide "Railways in Belgium" by Edward Dobson A.I.C.E., John Weale High Holborn.*

* This is quite incorrect as may be seen at page 12 of the "*Letter to the Shareholders.*"

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per mile for items assumed not to be included in it; and concluding thus,—'total £6,500: allowing an ample margin for contingencies, say per mile £8,000.' It is pleasant to compare these different authorities with one another. While the Bengal Military Engineer officer says 4,400*l.* per mile, the Old Postmaster swears by him, yet swells the sum first to 6,500*l.* then to 8,000*l.*, having only two pages before made in a note the following statement:*—'The line from Calcutta to Mirzapore, if executed in the manner proposed by the Railway Commissioners, may be estimated at 20,000*l.* per mile; from Allahabad to Delhi 8,000*l*; Calcutta to the Sutledge, it would be an average from 12,000*l.* to 15,000*l.*' "Oh, it depends on the manner in which the works are executed?" By no means, it depends on the estimates having been made for different lines! The author of the "Letter to the Shareholders" did not adopt the estimate of 4,400*l.* per mile for the Rajmahl line. On the contrary in page 12 of the letter in both editions he gives his own estimate of 8,000*l.* per mile, in these words: "an estimated capital of one million and a half, which might be required for the purpose of uniting Rajmahl with Calcutta," (the distance being under 200 miles), having previously recommended that the broad rivers should be crossed by floating bridges, and in a foot note he merely quotes the opinion of another party that the cost of construction of a certain portion of the work would be about 4,400*l.* per mile. That the

* When speaking of *another* Line!

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Old Indian Postmaster did not swear by the Bengal Military Engineer is twice proved by the Reviewer himself. 1st. by his adding 3,600*l.* per mile to complete the Military Engineer's estimate for the Rajmahl line. 2nd. by adventuring an independent estimate of his own for the Mirzapore line. Had the Reviewer said that the author of the "Letter to the Shareholders" swore by the "Old Indian Postmaster" there might have been something in it from their family resemblance which appears to have escaped the literary acumen of the sharp-sighted Reviewer. That the "Old Indian Postmaster's" estimate for the Mirzapore line should be borne out so far by the authority of Mr. Simms, as mentioned in a preceding page of the article in question, is gratifying, but as to there being any necessity for estimates for lines of entirely different character and locality being precisely similar is not to the writer an obvious sequitur. On this point, and possibly on some others, the logic of the Calcutta Reviewer appears to require revision; he occasionally indulges, with a happy dexterity, in knocking himself down instead of his opponent; and therefore those who might be disposed to impugn his candour can only admire the ambidexterous ingenuity which enables him, with his weapon pointed to the enemy, to demolish himself.

With few exceptions, the public press gave the writer credit for propounding sound views, "without any undue bias in favour of one project over another," praising and censuring equally from conviction, and those who differed from him in opinion

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promptly and liberally opened their columns for his replies to their observations. This was matter of peculiar gratification, the great object he had in view being to promote to the best of his ability the free and full discussion of one of the most momentous questions of modern times.

The four companies whose projects he believed deserved public confidence and support were the East Indian, the Great Western of Bengal, the Madras, and the Great Indian Peninsula; for instance in Bengal, the line from Calcutta to Rajmahl, and that portion of the Grand Trunk Line from Allahabad to the North West Frontier; in Madras, the line from Madras to Wallajanuggur and Arcot; and in Bombay the comprehensive scheme of the Great Indian Peninsula Railway Company. How have they passed the ordeal of public opinion and official and scientific investigation? The two first named, their intentions having been sanctioned and approved by the Railway Commission in India, were severally invited by the Court of Directors of the Hon. East India Company to tender for a concession for the formation of two sections, one in Upper and one in Lower India, to be made simultaneously. Soon after this, the East Indian, and Great Western of Bengal, which we have been referring to, amalgamated at the instance of the authorities, to facilitate the adjustment of a great public measure by removing any rival interest that might exist or arise, being the only two companies invited by the India House to propose for any portion of their respective projects. The consolidated Com-

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pany has since formally arranged the concession with the authorities for the two sections, and the virtual monopoly of the Bengal Presidency,—the terms shall be particularized immediately. The Madras line has been, as may be seen by referring to 112 of the following pages, favourably reported on, and recommended by Mr. Simms; and the Bombay scheme has gained the sanction and approbation of Mr. Robert Stephenson, the eminent engineer, in his Report thereon—page 137 of this brochure.

That Madras and Bombay, should have been excluded for a time from the eagerly coveted advantages of improved intercommunication, unblessed as they are with navigable rivers, is greatly to be regretted, but, if there was to be a choice surely there can be no question as to which of the three Presidencies was entitled to the preference, whether we regard the greatness of the existing traffic,* the relative amount of population per

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	Tons per annum.
* Traffic existing on Bengal line . . . . (Vide 1st. Report of Directors East Indian Railway and *note* towards the end of this preface.)	2,226,359.
Traffic existing on Madras line . . . . (Vide p. p. 110 and 116 of this work, and papers relating to Madras Railway p. 6.)	30,000.
Traffic existing on Bombay line . . . (Vide p. p. 131 and 140, of this work and Report and papers of Great Indian Peninsula Railway p. p. 9 and 31.)	180,000.

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square mile, or in the aggregate,*—the number and magnitude of the inland seats of trade and manufacture—the geographical position and political and commercial relations.† The pre-eminent importance of commencing the railroad system in Bengal, was strongly and emphatically urged by the Chairman of the Honourable East India Company at the court of Proprietors in June last,‡ and while Mr. Sullivan advocated the claims of the Madras railway, of which he was a Director, and another gentleman, a Director of the

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* Presidency.	Area. Square Miles.	Population.	Population, per Square Mile.
Bengal.	" 214,112.	" 60,000,000.	" 280.
Agra.*	" 88,900.	" 20,000,000.	" 226.
Madras.	" 141,923.	" 15,508,535.	" 109.
Bombay.	" 64,938.	" 6,251,546.†	" 91.

† For the External Commerce of the three Presidencies Appendix (H) may be consulted. It was compiled by the Author from Official Returns in the India House, to the most recent date those documents admitted of.

‡ " The CHAIRMAN said that the Directors were deeply impressed with the necessity of commencing railways in India as soon as they could. It was a great national, a great military, and political object, to establish those modes of conveyance, and it would economise many branches of their disbursement. And as to cotton, in Bengal it was more important to have railways for that article than in any other part of India, because the cotton produced in the Nerbudda, lost 12 months from the time it was gathered until it was exported. It was liable during that period to great deterioration, to charge for warehousing and transport.****But it should be in the recollection of the Court, that they had other objects of paramount importance in view. A connexion between the western provinces and the seat of Government was pre-eminently necessary, and this they proposed commencing as soon as they could."—*Morning Chronicle* June 24th. 1847.

* Upper India or N. W. Provinces. † See map accompanying "the Cotton Trade of India" by Major General Briggs F.R.S. The reader is also

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Peninsula line, was equally earnest in urging the claims of Bombay to the consideration of the Court, they both admitted that the line for connecting the Metropolis of British India with the N. W. Frontier possessed paramount claims; instead of detracting from its great and acknowledged merits; and if all who are interested in this great movement, were equally judicious, their more immediate object would certainly not be retarded, but might be facilitated by an unity of action, elicited by a reciprocity of good offices; instead of which, the organs for the lesser, and for the present disappointed, Presidencies,* now talk of the swamps of Bengal, as if the people were amphibious, or as if the indigo planters were obliged to fly in the rainy season for safety and solace, to the tops of their indigo vats, from the tumultuous flood. To allay the apprehensions of these somewhat injudicious friends to the general introduction of the railroad system into India, they are referred to the Report of the Railway Commission, the Report of the Damúda Commission on embankments, and other published official documents.

The prosperity of the subject Presidencies, is identified with, and dependant upon that of Bengal, for the revenue of merely a portion of this Presidency, viz., that of Bengal Proper and Behar, is nearly equal to that drawn from Upper India and the whole of Madras and Bombay put together;† it alone supplies the sinews

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* See note page xxiii. † See page 50.

referred to pages 50 and 51 of this work. The discrepancies observable are owing to the different dates of the official documents from which the calculations were made; for instance the table page 50 is more recent than that of General Briggs, and only applies to a portion of the Presidencey, while the other appears derived from less recent data.

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of war, makes good the short comings of the less fertile provinces—pays the dividend of 10½ per cent. to India Stock proprietors, supports the establishments of the Board of Control and India House, and many other items—besides enabling us to defend, consolidate, and improve other portions of our widely extended territory, naturally more exposed and less productive.

It now becomes necessary to advert to the extent, and nature of the privileges granted in the concession for the Bengal Presidency, and the prospects of the Company, destined to commence that magnificent system of intercommunication which is hereafter to pervade the British empire in the East.

"The East Indian Railway Company is to undertake to construct in the first instance, and to keep up and work when constructed, two sections of their proposed line of railway between Calcutta and the North-Western Provinces of India—one section in Upper, and the other in Lower India—and to expend thereon the sum of 3,000,000*l.* sterling. The Railway Company is to carry the government mails free of cost, and the troops and military stores at the lowest fares charged to passengers and goods.

"In consideration whereof the East India Company is to guarantee a minimum dividend of 5 per cent. per annum upon sums, which in the course of three years from the date of the railway company signing the first contract with the East India Company, shall be paid into the East India Company's treasury by the Railway Company, to an extent not exceeding 3,000,000*l.* sterling.

"This guarantee is to continue for a period of 25

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years, and the payment of the interest is to commence so soon as the payment into the East India Company's treasury shall amount to 100,000*l.*, and is to be made in London half-yearly.

"The East India Company is to provide and lease to the railway company, without charge or expense, for 99 years, all the land required for the railway; the land remaining the property of the government.

"When the profits of the railway exceed 5 per cent., the excess is to be divided between the East India Company and the Railway Company, until the amount which may have been advanced by the East India Company shall have been repaid: thus, supposing the line to pay 10 per cent., the proprietary would receive 7½ per cent., and the government 2½, until the advances should be repaid, when the whole of the profits would revert to the proprietors.

"Your directors beg to state their unanimous opinion, that these terms are such as they can most fully recommend the proprietors to adopt; they offer advantages superior to those enjoyed by any railway company at home or on the Continent.

"The guarantee establishes the railway payments up to 3,000,000*l.* sterling, on the basis of a government five per cent. stock, and offers a safe and eligible investment for money at a fair rate of interest, payable half-yearly in London, for twenty-five years.

"In addition to this certainty, the proprietors may reasonably indulge the hope of an early participation in the profits of the railway, which have been shown, by the data laid before them in April last, to promise

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a large additional compensation to the persons who may be disposed to embark their capital in the undertaking; and the proprietors will recollect, that for every payment made, they will receive from the East India Company an interest of 5 per cent, payable half-yearly in London.

"Your directors will receive payment in anticipation of calls, so as to allow parties to avail themselves of the East India Company's guarantee at once; they are prepared, to take the responsibility of receiving 15*l.* per share."

"All future calls, will be strictly regulated upon the principle of affording every facility to those who desire to convert their calls into a fixed stock, and rendering the calls as light as possible to those parties, to whom such an investment may not be at all times convenient."*

The guaranteed interest of five per cent. per annum will accrue from the 21st. day of October 1847. A warrant for the amount of the half-yearly interest will be passed from the treasury of the Honourable East India Company, and the dividends will be paid to the Shareholders at the offices of the East Indian Railway Company.†

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* *Vide Report of the Directors of the East Indian Railway Company as given in the Morning Herald and other papers of Aug.* 7, 1847.

† *Vide East Indian Rail. Co. Circular of Sept.* 11, 1847. The writer is happy in being able to state from authority that the Great Indian Peninsula Railway Company, has also obtained a concession on similar terms, although to a smaller

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The above being an abstract of the terms of the concession granted to the East Indian Railway Company, let us now, in a financial point of view, briefly examine the proposition of railways in India *viz.*, their applicability, and the security, and return offered for capital invested, under the following heads:—

1st. The applicability of Railways to India.

2nd. Safety of investment as a 5 per cent. Government Stock.

3rd. The probable returns from the railway when opened, based upon the cost of construction and the extent and nature of the existing traffic as proved by official documents.

1st. The applicability of Railways to India. This is an essential element in any calculation as to the ultimate probable return from the railway. That the difficulties arising from excessive inundations, violent rains and other influences of a tropical climate, quoted as likely to prove injurious to the stability of a railway can be effectually provided against, the successful working of the Jamaica Rail-

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extent, to those granted to the East Indian Railway Company. Five per cent. is guaranteed on £500,000 for 25 years, to be paid within three years, and to commence when £30,000 is paid into the India House. The first section opened, is to be from Bombay to Callyan 35 miles in length.

This is an important indication of the dawn of a better day for the cotton growing Ryots of Western India, and for the cotton spinning Operatives of Lancashire. The ability and zeal of the Promoters of the Bombay Railway Company, and the goodness of their cause well deserved the consideration of the authorities. Much is also due to the Noble Chairman of the Company Lord Wharncliffe.

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way may be mentioned, and the business-like promptitude, with which the Colonial Office lately brought to definite conclusions the negotiations with various Companies for the introduction of railroads into Ceylon, Demerara and Trinidad, after due investigation had been instituted, would form a strong presumption in favour of the climate and soil of India being equally safe and appropriate: but the perfect practicability of making and maintaining railroads in either of the three presidencies of our Indian empire, appears to be demonstrated by the present state of the roads and embankments of that country, and that this is a fair inference is proved by the surveys and reports of Engineer officers in the Indian service at Madras so far back as the year 1838, recently favourably reported upon by Mr. Simms at the desire of the government of India, by the elaborate surveys of the Engineers of the Great Indian Peninsula Railway Company approved and verified by Mr. Robert Stephenson, by the surveys, plans and sections of the country from Calcutta to Delhi 900 miles in length, examined and approved by Messrs. Rendel and Beardmore, and by the Report of the Railway Commission in India printed by order of the House of Commons. Captain Western of the Bengal Engineers, and a member of the late Railway Commission in India, published a Report in the Calcutta papers in 1843, on the application of railway communication in India commenting on the singular adaptation of the country for this mode of transit.

"It should, however, be mentioned that there are advantages as well as objections to be found in the pe-

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culiarity of the climate, and that it offers capabilities, if properly availed of, for the construction of more substantial and permanent roads than elsewhere. There are the three important elements of a powerful sun, a free and unimpeded current of air, and the great rapidity of growth of plants and shrubs for binding the earth. These are valuable auxiliaries, and to ensure stability only require the provision of sufficient water ways, at more frequent intervals, than have hitherto been allowed and especial attention to the original formation of the road under well qualified supervision."

"The unusual inundation which occurred at the period of the rains last year (1845), has been of advantage to the objects of the survey, as shewing the highest rise of the waters under extreme circumstances, and as affording valuable data for regulating the construction of that portion of the works, which comes within the influence of, or can be at all affected by it."*

Suppose to set the matter at rest we select Bengal and that portion of the Province of all others most liable to the influence of periodical rains and inundations.

"With regard to the two first, *viz*, :—Periodical rains and inundation, and the continual action of violent winds and influences of a vertical sun, I have to remark, that they certainly do at first sight appear of a formidable character; but experience has proved the practicability of forming works of this description, by what has already been accomplished, in formation

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* *Report of the Managing Director, East Indian Rail. Co.*

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of a road constructed in the face of difficulties apparently insurmountable; the work I allude to is the road from Chittagong to Comillah, a distance of 130 miles, which was constructed about the year 1795, by Mr. Elliot, the Magistrate of Tipperah; consequently it has stood the test of fifty years.

"When we consider that the country, through which this road passes, is more exposed to inundation than any other part of Bengal, besides the violent action of the tide, which rushes through the numerous creeks intersecting the roads, we feel constrained to admire the public spirit of the individual who attempted such a work, in the face of such formidable obstacles, and his energy, intelligence and judgment in bringing it to a successful issue; the road in question bears a strong resemblance to a Railway, in its high embankments, elevated in some places above the surrounding country to the height of 20 and 30 feet, and its surface is a perfect level throughout its course."*

"The duty which Government owes to the millions of its subjects who would experience from the completion of these projects an increase of happiness almost beyond the conception of Englishmen, is not only gladdened by the prospect of simultaneous profit, but is lightened by the extraordinary facilities awaiting its performance."†

It will be shown hereafter that, judging from

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* *Letters from* MAJOR C. A. MUNRO, *late Bengal Army, in Appendix to the Report of Managing Director, East Indian Rail Company.*

† Leading Article, "*Times*," June 14, 1847.

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analogy, the natives will quickly be alive to the advantages of a railroad, and that, if this mode of transit is applicable to their country, it is so in a still more especial manner to its valuable but perishable products.

2. Safety of investment as a 5 per cent. Government Stock.—This head one would imagine scarcely required any elucidation or discussion, and might be replied to at once by asking the simple question, are India Bonds safe, or is India Stock a very fluctuating or speculative investment? The characteristic of these is safety, and so is that of the East India Railway so far as safety is presumable from the credit, the resources, and the stability of Government, the territorial revenues of India being answerable alike for all, whether the charter be renewed in 1854 or not. The financial arrangements of the Hon. East India Company are all entered into with the knowledge and sanction of the Royal Government and should it assume at any time the government of India without the intervention of the India House authorities, it must, by an express provision of the Charter or act of Parliament,* take the country subject to all the debts and liabilities to which the territorial revenue has become liable.

India Bonds are too like Exchequer Bills to suit for a comparison being ineligible for permanent investment, from the rate of interest they bear rising or fall-

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* *Entitled, "An Act for effecting an arrangement with the East India Company, and for the better government of his Majesty's India Territories, till the 30th day of April, one thousand eight hundred and fifty-four."—28th August,* 1833.

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ing according to the abundance or scarcity of money. India Stock on the contrary is guaranteed by the Charter or Act of Parliament an interest of 10½ per cent per annum on the original £100 which at the price of £240 or £140 premium yields to the investor 4½ per cent per annum for twenty seven years with the prospect of losing at the end of that period £40 of the capital invested or whatever the sum may be in excess of 200*l.* paid for 100*l.* original stock the said dividend being subject to redemption by parliament upon or after the 30th. April 1874 on payment to the Company of two hundred pounds sterling for every one hundred pounds of the said Capital Stock, being the amount to be paid out of the security fund, as provided for in the Charter "for better securing to the said Company the redemption of their said dividend." The guaranteeing party being the same and the security proffered being precisely similar, priority of claim excepted, what is the difference between an investment in the Indian Railway and East India Stock? In the former there is 5 per cent. per annum for 25 years guaranteed by the State with the entire of the surplus profits (after the amount which may have been advanced by the East India Company shall have been repaid) of the Railroad during that period, the capital invested instead of being returnable after a short period of years, less by 20 per cent. than its actual value when invested (which we have seen is the position of India Stock i. e. what now costs 240*l.*, will when redeemed be exactly 200*l.*) merges in the enterprise of a private Company, but so

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intimately connected with and controlled by Government that it can never cease being identified with it, thus imparting a solidity and a permanency to its objects and results, and an integrity to its management which must be highly beneficial both to the shareholder and public, so that the safety of the two modes of investment may be assumed as equal although their designations be dissimilar. There is much however in a name, but there is little propriety and less sense in the conclusion, that because the bubble of the ignorant and designing in 1845 proved something worse than a delusion, or a dream, that an enterprise which has secured the immediate co-operation and guarantee of the goverment, after the most minute and careful scrutiny, should be placed in the same category because they both happen to be Railways!*

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* "It was with very great satisfaction that we reported on Wednesday the completion of the arrangements necessary to secure the actual commencement of the works of the East Indian Railway during the ensuing winter. The superintendence of the operations and of the general affairs of the company in India have been committed to a board of three experienced gentlemen, and on the 20th of next month these commissioners will sail for the scene of their enterprise with a full executive staff of surveyors and engineers. Before the termination, therefore, of the next cold season, the beginning, which in this good fight is even more than half the battle, will have been made, and interest and policy will speedily insure a triumphant conclusion. None of our readers can have forgotten the earnestness with which we have continually advocated the claims of this undertaking. On previous occasions, however, our duty has been rather to urge upon Indian authorities the title of the enterprise to immediate and efficient patronage, and to represent to a direction and a constituency never blind to the interests of their subjects or

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That very scrutiny which has postponed for a season

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averse to even costly measures of improvement, but essentially and venially circumspect in their decisions, that a benefit was really offered to their dominions far greater than any of those for the sake of which they have hitherto consented to a sacrifice or hazarded an experiment. But now that the charter and sanction of Government have been at length obtained, *it becomes expedient to direct general attention to the prospects and character of the enterprise in hand, lest an undertaking calculated to confer such infinite blessings on so many millions of people should suffer from the discredit which reckless speculation has thrown upon schemes at home*, and public support be wanting to the furtherance of a work which official patronage has at length so liberally set on foot.

"Looking at the affair, first, as a matter of business, it cannot be denied that the directors of the infant company have succeeded in securing fair and reasonable terms for the remuneration of those who may aid in the enterprise. The Indian Government has guaranteed a *minimum* dividend of 5 per cent. to commence immediately, and to continue for 25 years, or for 17 years after the completed line shall have been opened for traffic. A free lease of 99 years of all the land required has also been granted by the same authorities. There will be no compensation to landholders, no competition either now or hereafter with any rival applicants, and no Parliamentary expenses. The cheerful and undivided energies of a Government, which, for such a purpose, may be termed despotic, will be at the ready service of the adventurers. The average cost of construction throughout the line, even estimated after European fashion, will be but moderate, the portion below the midway station of Mirzapore being rather above, and that beyond it rather below the ordinary standard of expense. But it must be recollected on this head, that labour will be abundantly and cheaply supplied, and that the requisite materials are furnished by the productions of the country in most serviceable profusion. Means do not exist for calculating the probable traffic in this case with that imposing show of statistical exactitude which amongst ourselves ushers in a prospectus for connecting two deserted villages by a railroad of a dozen miles, but it is not difficult to conceive the available purposes of a line which will thread a popula-

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the electric impulse of steam before whose breath the

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tion of 30,000,000, and connect the seat of a mighty Government with its most exposed and most important frontiers, in a country where means of communication are more urgently called for and more miserably supplied than in any other in the world. No example could be brought of any projected line of which the advantages, the cost, and the bearings have been subjected to such critical scrutiny as in the present case was employed, but the tedious caution of the sanctioning body, if it has somewhat delayed the happiness of Hindostan, should at least be instrumental in satisfying the doubts of England.

"It would be impossible for even the most speculative and sanguine observer to portray all the possible results of the establishment of railway communication in the Indian Peninsula. But the certain and visible consequences are so momentous that their bare enumeration ought to stimulate the hopes or the exertions of every philanthropist in the kingdom. There will be an end to famines. Those terrible visitations which have been recorded and accepted as the natural and irremediable scourges of this devoted country will be terminated at once. For India is not like Ireland, where the total failure of a precarious and but half-human staple of food is a contingency that might in any season occur. There was never a year when the Peninsula did not produce food enough for its contented and penurious inhabitants. The droughts and scarcities were local. Canals and tanks would have neutralized the one, and a good highway the other. If the rich produce of the plains of Bengal could be interchanged with the crops of the table land of the Deccan, or the luxuriant abundance of Candeish and Tanjore be made reciprocally available for the ryots of either province, the desolating plagues of past years would be seen no more. There will be a check to sickness. By the means of these communications the malaria of a locality or a season may be cheaply and summarily exchanged for a climate more salubrious than Cumberland and more genial than Madeira, and the appliances of skill and the aids of nature may be brought home to every man's door. There will be new impulses and opportunities for civilization. The simple or suspicious native of the interior will be brought into easy communication with the seats of our power, and will

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hoary institutions of Brahma must totter and fall, is an additional source of confidence and safety to the English shareholder.

But it may be urged that the Indian Railway although equally secure with India Stock is inferior in this respect to the funded debt of England, the interest of the one being secured by the Imperial revenues, while the security of the other, is the revenue of a distant Dependency, which may possibly be lost by foreign conquest, or raise itself, as other distant Dependencies have done, into a great and independant Empire.

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appreciate more readily and deeply the creed and character of a people who are now nearly the oldest as well as the mightiest amongst the rulers in his land. The commercial results of the enterprise would be equally extensive. The value of every province in India would be multiplied tenfold, and the wealth of that land of fable, which was so glowingly depicted and so seldom discovered in early days, would now really flow in full streams to our harbours. The cotton of Berar and Bejapoor, which now perishes on the ground, or is frittered to dust on the road, would supply work and bread to thousands of our industrious countrymen, and the produce of every loom and plough from the Jumna to the Cauvery would be trebled in its worth both to the laborious native and to the people with whose exports he could provide himself in exchange. But these benefits, great as they are, are exceeded by the inexpressible accession to the general welfare of the poor Hindoos. There is a class of our readers, in whose eyes philanthropy outweighs every other consideration, and to their notice we recommend this enterprise, for if the well-being of others is to command the co-operation of men, we do most boldly assert that no mission ever sailed fraught with more momentous interests to a vast population, than that which is to depart from our shores on the 20th of next September." *Leading Article*, "TIMES," 27 *Aug.* 1847.

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With our present imperfect means of transit we have already humbled the pride and broken the strength of the fiercest soldiers in Asia, and it will be admitted that the repose of our rule by the invasion of an European power is now less likely to be disturbed than ever; as to the latter alternative, that a native hand should again grasp the sceptre, it is not only not probable, but not possible, to erect an independant power out of such discordant materials, there is, although much local attachment, no patriotism beyond the bounds of a village, no sentiment pervading the masses, but that which Hindoo and Mussulman feel in common—the instinctive and abiding conviction of the power, the beneficence and the permanency of our rule. This was demonstrated when the Government could raise money in loans during emergencies which appeared critical at five per cent.; while the most respectable merchants were paying ten. But supposing either or both of the contingencies adverted to were not only possible but probable—a railroad would be the very best means of repelling aggression from without, or crushing in the bud, disloyalty within,—a railroad would be its own protector and the best guarantee to its shareholders.

In brief, the interests of India and England are one; so intimate is the connection of the two countries, so great the commercial relations,* so vast the stream of

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* The cotton imported in 1846 into this country from the United States was worth £13,000,000. The value of the cotton manufactures exported to America was only £1,056,000. *But in the same year although the cotton imported from India was worth little more than* £1,000,000, *this country exported*

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wealth which flows annually from India to this country, whether as the proceeds of trade, or the private fortunes of the Anglo-Indians which are constantly being added to the general wealth, the noble and expansive field which India presents to our youth, instead of being driven from the amenities of civilized life, to the backwoods of our colonies, with no hope to sun the germ of greatness, no feeling to elevate but that of wild independence, many privations, little to solace, much to vulgarise and debase. In India, even in the secluded vales and lofty ridges of the far distant Himalayahs, the refinements, the elegancies, the enjoyments which render the homes of England so attractive and dear, have taken root and flourish, while a useful, honourable, and brilliant career is open to all.

Yet there are those who know not the difference between British India and British Colonies. One or two observations will suffice to mark this difference. The latter in the aggregate, so defective are their resources, that they are said to cost the Imperial Treasury the yearly sum of 3,000,000*l.*, while India pays directly to the India Stock proprietor 10½ per cent. per annum, has a revenue of 20,000,000*l.*, a maritime trade valued at 30,000,000*l.*, and supports an army of 260,000 men. These brave and devoted soldiers, have not only fought the battles of England in India, and Central Asia, but to uphold the power

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cotton manufactures to the East Indies and Ceylon, of which the value was £4,500,000, being about one fifth of the cotton goods, and yarn exported, or one eleventh of the value of the whole of the exports of this country.

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and dignity of her name the sepoy of Bengal and Madras crossed bayonets with the French in Java and the Mauritius, while the swarthy sons of Bombay marched with Sir David Baird to oppose the same enemy in Egypt.

"Should Great Britain be engaged in war with any European power, and particularly with France, there can be no doubt that every attempt would be made by our enemies to interrupt our communications with India through Egypt. *All Europe regards this interruption as one of the severest wounds, that the enemies of England can inflict on her power.*

"On the other hand, in case our enemies should prove sufficiently powerful to press us hard either in Europe or Asia, it would be a matter of inestimable importance to have it in our power to transport our military forces from Europe to Asia, and from Asia to Europe, with the greatest possible celerity, as the exigences of war may demand. A rapid means of communicating between India and Malta, both by means of the Red Sea and of the Persian Gulf, through Egypt and through Syria, would multiply tenfold the resources of Britain, and secure the defences of our possessions from Canada to Hong Kong. Indeed England, with her small standing army, with her population, not trained and disciplined to defend their own territory against invaders, and with Ministers who neglect her Navy, can never be duly secured against the sudden attacks of her rivals and enemies, until she can impose some restraint on their

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ambition by having it in her power to array the sepoy on the shores of the Mediterranean, and the Highlander of Scotland and the gallant sons of Erin, on the banks of the Indus and the Ganges, with a degree of speed which no other power can equal. The small amount of our military force, in comparison with the enormous extent of our empire, must be counterbalanced by abundant means of communication, and extraordinary rapidity of transport."*

India is an integral member of the British Empire, and could not be severed from the system without such a shock as would shake not only the constitution of society to its core in this country; but the whole of Europe would be convulsed, other sceptres would tremble and crowns become less glorious, public credit and private confidence would be paralyzed—having lost India —the glory—the power—the strength of England would be destroyed—her invincible and veteran armies would be scattered and broken—her magnificent and costly fleets would be captured or sunk—her banner dared not be unfurled by land or by sea—her wondrous commerce would be annihilated—the *prestige* of her arms and the credit of her name would be laughed at—the interests of India and England are one and indivisible! When the India Stock holder, saw his property carried away

* Extract from an interesting pamphlet *"On the Communication between Europe and India through Egypt" by George Finlay, Esq., K.R.G.*—SMITH, ELDER, & Co.

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by one fell swoop, it would be high time for the English fund holder to put his house in order.*

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* COMPARATIVE STATEMENT—No. II.

Showing the Income to be obtained by the Investment of £1,000, *in ready Money, in—*

THE 3 PER CENT. CONSOLS.				E. I. RAIL. GOVERN. STOCK.			
A				B			
	£.	s.	d.		£.	s.	d.
£1,000. in Cash, if invested in Consols, at 87, will purchase £1,149. 8s. 6d. of Stock, and give an Annual Income of .	34	9	8	£1,000 Cash, if invested in the purchase of East Indian Railway Shares, at par. i. e. 5s. per Share. by purchasing a moderate number,—say 60 or 70,—and paying up the balance of the £1,000, in anticipation of Calls, permitted to the extent of £15 per Share, will produce an Annual Income, guaranteed by the Government for 25 years, of . .	50	0	0
Being at the rate of £3. 9s. per cent. on the original Purchase Money.				Being at the rate of £5. per cent. on the original Purchase Money.			

A comparison, exhibiting a difference in favour of the East Indian Railway Government Stock, of £1. 11*s.* for every £100. of Purchase Money; or, in other words, an *addition* to the purchaser's income of about 45 per cent., or nearly one half. *Vide—An Enquiry into the absolute and comparative value of the Government Guaranteed Railway Stock of the East Indian Railway Co.—by an Accountant*—page 12.

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"The guarantee of a *minimum* dividend is nothing, in fact, but raising a loan at a given rate of interest for the purpose of some beneficial and lucrative undertaking, and amongst the many millions which we have raised, it would be very difficult to find one of which the purpose was so promising as this."*

Having shown the safety of a guarantee of the Hon. East India Compy., approved and confirmed by Her Majesty's Ministers, a few words will suffice for the only remaining point proposed to be discussed.

3rd. The probable returns from the Railway when opened, based upon the cost of construction, and the extent and nature of the existing traffic as proved by official documents.

Any one may form a pretty close approximation, to the probable cost of that portion of the Grand Trunk Line from Allahabad to the N. W. Frontier, for (in a distance of seven or eight hundred miles) there will be no works of any magnitude, if we except a bridge or two, no tunnel, heavy cutting, or embankment, so that with provision for water way there would be little to do but to lay down the rails. The present great trunk road from Calcutta to Benares, 3 feet high and 32 feet wide, partially metalled, including culverts, but exclusive of large bridges, and engineer officers salary cost 250*l.* per mile. This, with allowance for additional culverts, will give the English reader some idea of the expense prior to laying down the permanent

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* *Leading Article,* "Times," *June* 14, 1847.

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way. The cost of the permanent way varies from 3,000*l.* to 7,000*l.* per mile for a double line of rail. The eminent engineers, Messrs. Rendel and Beardmore, estimate the cost of the line from Allahabad to Delhi at 15,000*l.* per mile, making the outlay for the easiest line in the world, without land compensation or parliamentary expenses to amount to half the average cost of construction of English railways. Mr. Robert Stephenson, in his admirable Report on the Bombay line, estimates the cost including fixed engines, several miles of open gallery and tunnel at 15,000*l* per mile, and Mr. Simms in his Report on the Madras line for a single rail about 8,500*l.* per mile.* "Judging," he says, "from what I have seen of works in Bengal, and knowing the cost of rails, engines and machinery, which I expect must be nearly all brought from England," but taking the outlay at the highest, i. e 15,000*l.* per mile, and allowing that the traffic returns received from government officers are correct,† then after every deduction, and without any increase in the existing commerce of the country there would be, at 2d per ton per mile, (not one half the average price of land carriage in India,‡) a yearly dividend of more than 20 per cent.

That the natives would gladly avail themselves of the railway there cannot be a doubt, for although there were no diminution in the charge of transit, an immense saving would accrue in the transmission of perishable articles, exposed as they now are from a variety of causes

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* Vide p. 63 for expense of Continental and other lines.

† Vide Appendix (G.I). ‡ Vide p. 43.

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whether on the roads or rivers, to loss and deterioration. The unexpected advent of the Monsoon, one of many evils, always most unpropitious to commerce in general, renders cotton, the great staple of the country, unsaleable for the foreign market, and profitless for home consumption, if indeed it escape complete destruction.

Thus the wretchedly defective means of transit prevailing in India is alike inimical to the agriculture and commerce of that country, and calculated to impede and fetter the manufacturing progress of England. The pack bullock sinking prostrate under his load, and the disabled hackery sticking in the mud, are facts that ought not to speak more convincingly, of bad roads in India, to the statesman, the philanthrophist, the mill-owner, and the operative of England, than the closed factories and silent looms in Lancashire. The Blackburn operatives did well to petition their masters to reserve the little cotton they had in store till the winter, but they should turn their eyes to the banks of the Nerbudda and the elevated plains of the Deccan, for, from thence is their permanent employment and relief destined to come. The dawn of a new era is already breaking in the East, when the blessing of a superabundant harvest will cease to be a curse, oppressing the farmer with products, the very luxuriance of which depreciates their value at home, while the want of intercommunication renders their barter or sale elsewhere impossible. With railways not only cotton, silk, and the brilliant dyes of India, but sugar, spices, and the many

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cereal and other products of the fertile fields of that vast and most productive region will at once not only supply our home population with labour but with wholesome and cheap food to sweeten that labour, creating at the same time new outlets for the products of our manufacturing science and skill. The cause of the poor but contented Ryot of India ought to be identified in the minds of all, with the distressed, but orderly cotton spinner of England.

Certain parties, from timidity or unacquaintance with the growing spirit of enterprise exhibited by the natives of India, say, that their religious prejudices would prevent them travelling by a railroad; and their habitual apathy, and their ignorance of the value of time, would stand in the way of their adopting any innovation, however it might promote their interests;—an appeal to facts will at once prove the absurdity of such statements. The *Bengal and Agra Gazetteer* for 1842, tells us how they appreciate the *innovation* of a good road:—"The Moguls and other merchants who carried woollen cloths, piece goods, and other less bulky and lighter articles, to the Upper Provinces, have in great measure given up the more tedious voyage up the river, and now take those goods to Benares and Cawnpore by carts. The greater expense by this mode—a cart costing about fifty rupees (5*l.*) from Burdwan to Benares, and sixty more rupees to Cawnpore—is more than made up by the time saved. The carts go in one month and a half, while four and six months were consumed in the voyage by boats."*

* The population of Calcutta, with its enormous suburbs

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may be fairly estimated at 300,000. The total value of its imports and exports by sea for the year 1843-44 amounted to near £15,000,000;* and the inland trade between Calcutta and the N. W. for 1844-45 exceeded 2,000,000 tons.† The principal portion of the above traffic passes through Calcutta to or from the interior of the country, by the Hooghly and Ganges rivers, by a dangerous, tedious, and expensive mode of transit, for although the river craft convey goods on the Hooghly and Ganges at little more than 1*d.* per ton per mile, yet, against this *apparently* low rate, the high charges of the steamers compete successfully, for the following reasons: the insurance from Calcutta to Rajmahal (distance 200 miles) is as high as from London to Calcutta; the loss of interest by delay and uncertainty of arrival; the injury done by damp and prolonged partial exposure to the weather—this, as in cotton, sugar, and salt, frequently occasions enormous loss; the loss from pilfering and waste, so great as 20 per cent. in some articles; and also the robbery of the boats by gangs of river pirates. From these causes, the native merchants, where roads are available, prefer paying 7*d.* per ton per mile. This is the price of land-carriage in India, as stated in an extract of the *Delhi Overland Gazette*, published in the *Morning Herald* of 4th December, 1846:—

"The average cost for conveyance of goods by land carriage in India may be estimated at 30 rupees per ton (27¼ maunds) every 100 miles. By a Railway, at the ordinary rate of 2.88*d.* per ton per mile, at the average velocity, it would be 13 rupees per ton, per 100 miles. Here, then, there would be an actual saving, in the mere cost of conveyance, of nearly 200 per cent., and this saving in addition to the other unnumbered advantages which increased speed affords."

Bengal.

In the year 1833, the late Mr. Bell, an able statistical reporter, was called on to investigate the condition of the inland communication of Bengal, and he writes as follows:—

* Vide Appendix (H.); compiled by the author from official returns in the India House. † Vide Appendix (G I.)

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land, has already prepared the native mind for the

"The internal trade of Bengal by land is chiefly dependant on bullock carriage, which is exceedingly tedious and inconvenient. It is true that Bengal is intersected by many navigable streams that fall into the Ganges, and afford great facility to water carriage; but there are at present so many drawbacks to river navigation, that the importance of opening the resources of the country by good roads, must force itself upon the attention of every one who has taken the trouble to give the subject consideration."

"Within the last seven or eight years," says General Briggs, (in 1840), "a good road between Jubalpore and Mirzapore has been formed; and it is satisfactory to know that, although 400 carts only passed over it in the year after it was built, no fewer than 6,000 went along it in 1838, and this number will daily increase."

MADRAS.

A Collector of Revenue in this Presidency reports (in an official letter now deposited at the Board of Control) that a pack-bullock track (not a cart road) in his district, which was so steep in one portion as to compel the loaded animals to slide down upon their haunches, being levelled to an extent that enabled the bullocks to walk down the incline, the traffic on the path or track was quintupled in a year.

BOMBAY.

"As a proof on this new line of the effect of improving roads, I may mention the instance of the Bhore Ghaut:—

"When this pass was first made practicable to wheeled carriages, about the year 1828, the tolls realized between £400 and £500 a year. Twelve years ago a speculator was ruined by farming them from Government for £1,000. They now annually let at between £3,000 or £4,000 per annum, so that in four years, besides providing for the expense of annual repairs, the toll now more than covers the original cost of constructing the road.

"As far as my experience in India goes, no road has ever been constructed without an immediate and almost magical effect."—*Two Letters addressed to Lord Wharncliffe by* S. WILLIAMSON, Esq., *late Revenue Commissioner.*

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benefits to be derived from the latter. So eagerly did native merchants take advantage of the steamers, soon after they were established for the conveyance of their goods, although the charge was very high, that the tonnage was frequently put up to auction, or conceded as a matter of favour; and the tonnage of the steamers (although greatly increased), is generally bespoke for many weeks.

The native community look forward to the introduction of railroads with a deepening interest. Last year, at a great meeting of the Brahmins, held at Calcutta, it was decreed, that when going on pilgrimage, it would be as meritorious to travel by railroad as in any other way. But the most interesting and important proof of the anxiety of the natives for improved intercommunication, is contained in the following extract from an Indian paper:—

"THE BENARES STEAMER.

"We hear that a public meeting, which was attended by many of the most influential and wealthy natives of the place, was held last week at Benares, for the purpose of forming a company for the establishment of a regular passenger steamer between Benares and Mirzapore. The two cities are well situated for the experiment, and we hope that it will be attended with success. The connexion and intercourse require some speedy communication, which the proposed company is designed to supply. All these efforts must be looked upon as precursors to the future and further development of the resources of the country,

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and we are glad to find the native community not insensible to the advantages to be derived.

"The united population of Benares and Mirzapore can be very little short of half a million, and the distance between the stations cannot exceed forty-five miles. The voyage may therefore be made easily in one day.

"The first steamer,* which is to be named the '*Kaseejee*,' has been in progress since July 1846, and will be in the country in about a twelvemonth. She is to be 100 feet in length, 16 feet beam, and to draw not more than 2½ feet, with minimum speed of ten miles an hour.

"From the eager desire evinced by the most influential and intelligent members of the native community to co-operate in the establishment of this (to them) novel mode of conveyance, it is argued that the '*Kaseejee*' will be only the first of many boats of a similar description hereafter to be required on the Upper Ganges."†

In Appendix (G.I.) the reader will find an abstract of the existing traffic, compiled from official documents, and which taken in conjunction with the smallness of the cost of construction form good grounds for believing that the returns from the railway will be larger than those derived from any similar undertaking in any part of the world. Should the pre-

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* Now building in London.

† *Mofussussilite*, Sept. 15, 1846. See p. 615 of the "*Friend of India*."

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liminary sections be completed for a sum not greatly exceeding the estimated outlay, the Government it is understood will be prepared to give a fresh guarantee, on additional capital, to enable the Company to execute other sections of the Trunk Line, without waiting for returns from those opened.

But the dividend of the Shareholders must be materially increased by exclusive attention being paid to one section i. e., either by the completion of the line from Calcutta to Rajmahl without a section in Upper India, or by the opening of a large section in the latter without breaking ground in Lower India.

In the first edition of "Indian Railways" the following passages occur in different sections of the work, strenuously urging that the East Indian line "should for various reasons, as the best mode of fulfilling its ambitious hopes of being, as the Ganges is now, the great highway of India, break ground at Mirzapore, (or rather at Allahabad) instead of Calcutta, and proceed by Cawnpore to Agra and Delhi."

"On the whole, then, it is our conviction that the Great Western of Bengal (from Calcutta to Rajmahl) and the line from Allahabad to Delhi, co-operating with fleets of river steamers, from Rajmahl to Allahabad, would at once be not only the most judicious, the easiest, the least costly, the soonest constructed, and in every other point of view the most advantageous mode of *introducing* the railway system into India."

The above suggestions are again respectfully recommended to the consideration of the authorities with the following explanation:—

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In June 1846, when the writer advocated as above, that a line should be made in Upper India simultaneously with one in Lower India,* it was under the impression that a minimum rate of interest on 5,000,000*l.* would have been guaranteed, which would have sufficed for completing the line from Calcutta to Rajmahl and a large section in Upper India; but as 3,000,000*l.*, the sum actually guaranteed is declared inadequate for these purposes, the impolicy is apparent of burthening the, certain to be productive, Upper section with a fragment of a section in Lower India leading, comparatively speaking, to nothing. No assistance could be given to the Government, or general commerce of India by opening a portion of the Rajmahl line, unless that portion from Rajmahl to Mirzapore on the Hooghly 120 miles in length, and which is the exact line of Colonel Forbes' celebrated canal. But if the Railway is to commence at Calcutta, or rather, as the writer wishes, at Howrah on the opposite side (where wet docks could also be made), and connected with Calcutta by a steam bridge, then in that case no great purpose could be answered until the Railway debouches on the main Ganges and thus supersede the present tedious, uncertain and dangerous channels of commerce, the Nuddea rivers and Sunderbunds, which convey to and

* When he stated afterwards in a morning paper that, by the concession of two sections of the East Indian Trunk Line, one in Lower India commencing at Calcutta, and the other in Upper India commencing at Allahabad, he would in a great degree have achieved his object, it was in the belief that another Company would in that case have been allowed, by a subsequent concession, to connect the lower section of the Trunk with the Ganges by a branch to Rajmahl.

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from Calcutta and the main Ganges upwards of 2,000,000 tons annually.* When the Railway from Calcutta to Rajmahl, relieved the inland trade from these various impediments, the necessity would no longer exist, for the steamers having their machinery in one vessel and their passengers and goods in another, and the native cargo-boats would no longer, for nine months in the year, be confined to the alternative of either subdividing their freights amongst a number of small frail craft to pass the Nuddea rivers, or to go by the Sunderbundes an extra distance of 320 miles. Rajmahl would thus become the head-quarters of the inland trade, and a railway from it to Calcutta would, by bringing the vast descending trade of the Ganges into contact with the ships of all nations anchored off Calcutta, supply in the most effectual manner the only link wanting in the chain between the internal and external commerce of the country.† By making a portion of the Rajmahl line,

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* The commerce of the Ganges, as given in the former editions and in page 46 of the present is now proved to have been greatly understated.

† Existing traffic on line proposed by East Indian Rail. Co. according to "Officially authenticated Government returns" for—1844-5—was . . . 2,226,359 tons.
(Vide Appendix G.I.)
The value and tonnage of imports and exports of Calcutta by sea for the same year was—£18,024,420—and . . 531,262 tons.
(Vide Calcutta Review No. 14.)
Showing an increase in imports and exports over the previous year—in value—£3,305,205—in tonnage . . . 4,989 tons.
(Vide Appendix H.)

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nothing would be achieved—by connecting Calcutta with Rajmahl by means of a railway—a new impetus would be given to the commercial prosperity of India.*

The mode of introducing the Railway System into India, has been referred to the Governor General in Council, and that this enlightened nobleman will neglect the interests of Commerce is not to be believed. Lord Dalhousie is reported to have said that he went to India not to elevate England by foreign conquest, but to elevate and enrich both England and India by sending home cotton; it were "a solecism of power to think to command the end, and yet not to endure the means,"† to accomplish this great object he must have railroads;‡ then—and not till then—will the supply of the

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* It is gratifying to the writer to find that his views are corroborated by the authority of the Governor of Bengal.

"A railroad from Calcutta to Bogwangola or Rajmahl, will not answer the purpose for which it is undertaken till it is complete, so as to connect the termini with one another; for both these projects contemplate as their main objects the conveyance of merchandise from the river Ganges, at the points of their northern termini, to Calcutta."

"Between Calcutta and Mirzapore there could be no useful division in the line."

"Above Allahabad the line might be divided from that place to Cawnpore, from Cawnpore to Mynpooree or Allyghur, from either of those places to Agra, and from Agra to Delhi, and each of these divisions would form a valuable communication between the places named."—*Vide Minute by the Hon. Sir F. Maddock ordered, by the House of Commons, to be printed* 15 *February* 1847.

† *Bacon's Essays of Empire.*

‡ Vide *Economist*, Aug. 28, 1847: and *Report of Commissioners on the cultivation of Cotton in India.*

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raw material of the greatest of the staple manufactures of this country be placed upon a firm basis, and the energy and skill of Europe come fairly into contact with the inexhaustible resources of a soil which has for ages, repaid, with three harvests in the year, the most rude and inefficient husbandry.* Then will our commercial and manufacturing greatness be placed beyond the caprice of a jealous rival, himself dependant on the labour of his slaves; but even with America well affected, and the reverence of the lash unimpaired, the premature advent of a frost or the visitation of a grub to the cotton fields of New Orleans might at any moment be fatal to us!

Were the philanthropic and enlightened mind of this country consistent with itself, the poor but free and loyal labourer of the East would then have what he has never had—hope! and we should rivet no more

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* "The farmer merely scatters the seed among the mud at the commencement of the fair weather, and is at no other trouble with his crop, until he comes to reap it.

"There are reckoned three harvests annually, viz. *Bhadai*, reaped in the rainy season, including broadcast rice, maruya, maize, &c.; *Khurif*, reaped in the cold season, including transplanted rice, janera, &c.; and *Rabi*, reaped in spring, including wheat, barley, linseed, peas, &c."—Vide *the History, Antiquities, Topography, and Statistics, of Eastern India; compiled from the official reports of Dr. Francis Buchanan deposited in the India House. Edited by Mr. Montgomery Martin, London* 1837.

"Although thus unaided by the ingenuity of man; fields have been certainly in *unremitting* cultivation for generations, and beyond the memory of any man living."—*Vide The Bengal and Agra Annual Guide and Gazetteer* for 1842. *William Rushton & Co. Calcutta.*

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with our gold the chains of the negro of the West.

"The severest blow ever yet struck at slavery will have been accomplished, that, namely, of proving in a practical manner to the world, that the labour of the free man can effectually compete in the market with that of the slave."

When England does her duty to India, her dependence on America will cease, for then will be poured into her bosom a boundless supply of both cotton and corn from her own magnificent possessions in the East. Then, under the guidance of England, will India arise rejoicing in every variety of climate, soil, and product necessary or agreeable to man, to revolutionize and enrich the commerce of the world.

London, Dec. 1847.

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SINCE the foregoing pages were in print it has become evident that the suicidal policy of England towards India is being felt by certain parties in a way not to be mistaken, and will speedily receive some share of the attention of Parliament.

On the 10th instant a short preliminary discussion took place in the House of Commons regarding Railways in India between Lord Jocelyn, Sir R. Peel, Mr. Bright, and Mr. G. C. Lewis, Secretary to the Board of Control.

Mr. Bright, who had given notice of his intention to put a question with reference to the steps that had been taken for the promotion of railways in India, particularly in those districts in which cotton is chiefly grown, remarked that Lancashire, in this one year, had paid as much, owing to the failure of the crop in America, as would have made one of the most important of the lines recommended in the following pages, and gave notice that immediately after the recess he should move for all papers and correspondence on the subject—"*The subject was of the first importance to Lancashire.*"

The productive power of India as regards cotton is unquestioned. The quality of the staple may be judged of by the price of cotton in the Liverpool market; 3rd Sep. East Indian 6/½d. Orleans 6/⅛d. to 6/¾d, perlb. 3rd Dec. Surats 3d. to 4/¾d.—Orleans 3/⅜d to 7d .per lb. *Manchester Guardian, Sept.* 4, *& Dec.* 4, 1847.

See also report of meeting at Manchester on the cotton question in same paper—*Dce.* 15, 1847.

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The following extracts as they convey the sentiments of the press in general both in this country and in India, regarding the arrangement which has been entered into with the Govement may not prove unacceptable to the reader:—

A recent number of the "*Friend of India*" states that—"The terms which have now been offered, will enable the railway company to raise funds to any extent in this country (India). As soon as the present five per cent. loan is closed, its notes will begin to bear a premium of two, or three, perhaps, of six or seven per cent.; and there will, therefore, be the strongest inducement to subscribe for railway shares, which will soon obtain the same credit in the market as the Government promissory notes. The whole sum of fifteen millions required for the Calcutta and Delhi rail may be obtained in this country on these terms, with almost as much ease as in England.

"There is therefore no obstacle to the immediate commencement of the undertaking; and as it is left to the local authorities in India, to regulate the direction which the rail will take, no time should be lost in directing Mr. Simms to report definitively on the most eligible line for the first stage from Calcutta. It is greatly to be desired that the ceremony of commencing this undertaking should if possible be included in the calendar of the present year. It will be a very pleasing circumstance, that the first sod of the first Indian Railway should be turned up by the nobleman who has completed the conquest of India, and placed us, for the first time, in a position to devote the resources of the country to the pursuits of peace. If there be any truth

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in the report given in the *Englishman*—that Lord Dalhousie has the best chance of being appointed to succeed Lord Hardinge, we may expect that the cause of Indian rails will receive the greatest encouragement from the advent of a statesman, whose first introduction to public honours was in connection with the railway department of the Board of Trade, in which he exhibited those talents for business which have contributed so speedily to raise him to the post of the highest responsibility in the British Empire."*

The "*Times*" has the following:—

"A pamphlet has been published in connexion with the East Indian Railway, showing the absolute and comparative value of its shares.† These, as it is known, bear a guarantee of the East India Company for 5 per cent. for 25 years, the other prominent conditions of the undertaking being that the India Company shall grant the land required free of all charge, and that the line shall revert to the Government at the end of 99 years. The calculations now made show that the sale of 1,000*l.* Consols, and an investment of the proceeds in the Indian Railway at par, would give a clear additional income of 12*l.* 15*s.*, and also, that the difference between the investment of 1,000*l.* cash in Consols or in the railway would amount to 15*l.* 10*s.* 4d per annum, or 1*l.* 11s. of income in favour of the

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* Vide also *Indian News*, Nov. 5, 1847.

† *An Enquiry into the Absolute and Comparative value of the Government Guaranteed Railway Stock of the East Indian Railway Co.* By an Accountant.

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latter for every 100*l.* of purchase money. Against this favourable contrast, it is urged, the only points to be considered are—1. The possible loss of our Indian empire; 2. The possible diminution of the existing traffic of the country after the introdution of railways; and, 3. The possible omission on the part of the directors of the railway to make the usual reserve fund for the replacement at the end of 99 years of the capital laid out. The first of these points—the loss of our Indian empire—is of course a contingency upon the possibility of which it is hardly necessary to calculate; the second—that the tendency to locomotion may decrease with an increase of facilities—is also not likely to be entertained; and the third—the neglect of making a reserve fund—is an evil that could not arise without the concurrence of the shareholders themselves, while it is also one which, looking at the small annual appropriation that would be required for the purpose, there would be no temptation to sanction; the contingency, moreover, under any circumstances, being too remote to affect in any very material degree the present calculations. In conceding the existence of the inducements alleged, it is necessary, however, to point out that in no case can a stock of this description ever become as marketable as Consols, and that a considerable difference in value, although, of course, nothing like that which now exists, must in consequence always be found in favour of the latter. The contingency of the line not paying 5 per cent. at the end of 25 years, when it will be left to its own resources, it must likewise be remarked, depends not merely on the question whether

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the existing traffic will continue (of which there could not well be any doubt), but whether the present estimates of the company have been safely formed. On this point we entertain no misgivings which are not more than counterbalanced by anticipations of the enormous increase which a quarter of a century would develope in the industrial pursuits of the population; but still it is one which introduces an element of speculation that should be plainly recognized by all intending purchasers. On the other hand, it should be understood that, although half the profits beyond 5 per cent. after the expiration of 25 years will go to re-imburse the Government for any previous advances that may have been called for under their guarantee, the remainder will be divided amongst the shareholders—a prospect which, viewing the matter as a speculation, certainly causes the chances to preponderate on the favourable side. It must also be added, that the mere accumulation of the surplus which would be received annually from this investment, as compared with what would be received from Consols during 25 years, would, if regularly laid out, bring back more than 55 per cent. of the original sum; so that, supposing the railway after that time to pay no more than 2 per cent., the holder would still be in as good a position as if his purchase at the outset had been in the English funds.

In pointing out these circumstances we are relieved from the sense of injury to be inflicted on the country that would in all other cases attend the publication of facts likely to increase the flow of capital to railway undertakings, since there can be no question that the

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consolidation of our power and the welfare of millions in the East depend so much upon a speedy introduction of this means of communication as to render all ordinary considerations inapplicable; the amount required is, moreover, comparatively small, and we have, besides, the possibility that this really vital aim may attract and rescue a portion of that capital which is otherwise destined to be wasted in some of the many delusive and unecessary projects which still threaten in this couhtry to be commenced and pushed forward to completion.*

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* *Money Article* "*Times*" 10 Sept. 1847.

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PREFACE TO THE FIRST EDITION.

The Directors of the Honourable East India Company having deputed Mr. Sims, an eminent engineer, to investigate the circumstances of railway communication, as applicable to India, in conjunction with a commission in that country, under the orders of the Governor-General in council, and his Report having recently arrived, important results may immediately be expected; and as it is understood that, both that Report and the recommendation of the Commission generally are most favourable, it is hoped that the following pages may not be deemed inopportune.

The arrival of the Governor-General's dispatch on this subject is fully expected by the next mail.

On the receipt of which the court will at once have this important and interesting subject brought fully and officially before them, and be enabled to determine, in conjunction with her Majesty's Ministers, the particular lines to be adopted, and the terms on which concessions or grants shall be accorded, for developing this system of intercommunication which is destined to be a new and important element of our power in

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India, whether for the defence and consolidation of our empire, the opening of its inexhaustible treasures, or the elevating in the scale of humanity its multitudinous people.

This great engine of strength, wealth, and civilization, will speedily arouse the attention of all in Europe who have sympathy with the advance of nations, the dissemination of riches, and the just performance of high and sacred duties, to a distant and subject people.

The successful solution of this problem, will be one of the most mighty achievements of modern times.

From having bestowed some attention on the mode of introducing an improved communication in India, and having a considerable knowledge of the country, the writer has been induced, in compliance with the wishes of those, whose opinions he respects, to throw the few following observations together, and if they are found useful by such as have no personal acquaintance with India, his object is attained.

London, July, 1846.

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PREFACE TO THE SECOND EDITION.

When the first impression of "INDIAN RAILWAYS" was on the eve of publication, the despatch of the Bengal Government, regarding the introduction of Railway Communication into British India, was received at the India House, and more recently, the report of the Commissioners appointed by the Supreme Government, to enquire generally into the merits of the question, has been published by order of the Honourable the House of Commons.

That some of the views enunciated in the latter official document, are but little in accordance with those adventured in this pamphlet, was to be expected, and it is a matter of satisfaction to the author, that any of his opinions should be sanctioned and supported by those of the Railway Commission and he sees no reason why he should relinquish in this Edition, anything advanced in the first.

There is much additional matter introduced in

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this impression, in connection with the statistics of India and other subjects having reference to the requirements of that country, for improved internal communication, or to its capabilities of emancipating itself from its primitive, rude, and most inefficient roads and conveyances, achieving by one mighty bound, what other nations have taken centuries to accomplish; and, profiting by the experience of Europe, selecting what has worked well in the several modes of railway administration, such a controlling power might be easily placed in the hands of the Government, without deadening the impulse which private enterprise alone can impart, and effectually prevent the springing up in India of an "imperium in imperio," as has resulted in this country from the laxity or want of foresight on the part of the legislature, and the encroaching audacity of successful enterprise, placing the roads of this great country—the arteries of her vital energy and strength—in the hands of private individuals, with power to tax their fellow subjects, without appeal, to an amount equal to the revenues of a mighty Empire.*

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* Should the Honourable East India Company grant a guarantee, upon giving a concession, the relation of private enterprise, and the executive of the government, would of necessity be approximated.

This is not the place to enter into particulars, but it may be stated, that one shilling and eleven-pence paid into the In-

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In compliance with the wishes of various correspondents, more detailed information regarding particular projects is supplied. This has been given the more willingly, as the spurious and ridiculous emanations of the ignorant and designing, are brought, by a system of gambling, to rank, apparently, as high in public estimation, as the most feasible and legitimate undertakings sanctioned by scientific and local knowledge.

Severity of comment has been pointed out in the following pages, but those who made this allegation were silent as to injustice. What language can be too harsh, or animadversion too pungent, for those who would palm upon the public the howling wilderness, sullen in primeval solitude, for fields teeming with herds and flocks and rich in husbandry; wretched, isolated villages, as opulent cities, rejoicing in extensive commercial relations.

In one Prospectus, in addition to a number of imaginary towns, a small fort, on the top of a hill 3,000 feet high, is impudently put forth as a populous, flourishing, and accessible city, while in fact, it is a mere habitable speck in the jungle, and its population, a sergeant's guard!

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dia House Treasury, would frequently be an equivalent for a four per-cent guarantee, and prevent the necessity of throwing open the Calcutta treasury, by making an advance upon goods.

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There are those who advocate as the grand desideratum for India, the connecting of the three seats of Government, in utter ignorance of the vast regions which intervene, the extent and nature of the present intercourse, and the little political advantage that would result from such an arrangement with the exception of uniting Calcutta and Bombay.

There are also individuals who love to stand still like ancient land marks, while the world is advancing around them ; they laugh at everything they do not understand, and their grasp of mind, only enabling them to comprehend, or to believe, what is patent to their senses, their risible faculties are frequently excited. The idea of introducing railways into India, was with them a palpable absurdity, on account of physical obstacles ; the present roads and embankments of the country, and finally the report of the Railway Commission were appealed to, and set the matter at rest ; they now say, although the railways are made, the people won't travel by them ; as they are all pilgrims, and the longer time they take in going from one holy place to another, so much the better, the merits of this devotional act consisting in the delays and difficulties to be endured and surmounted. As if the few poor wretches of low caste, who crawl for some hundreds of miles on their stomachs to Juggernauth to gain a pro-

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fitable reputation for sanctity were to be taken as typifying, by their habits, the distinct castes, classes, and sects of the whole native community. As well might these *stationary* gentlemen term us a nation of fanatics, because we happen to have a few wild enthusiasts among us; or say, that in England we refuse to travel by railroad because certain ancient dames still sigh for the "slow coach" of their youth: nothing can be more ignorant or unfounded than such assumption. Pilgrimages in the East are generally combined with business and other worldly avocations,* and those who can afford it travel on horseback, or in carriages, and the conveyance of pilgrims in India, has been reckoned as no inconsiderable part of the traffic for railways, both by Europeans and natives. Col. Ouseley, Political Agent at Chota Nagpore, remarks, that, "The natives can appreciate well, and better in some cases, as we can, the advantages of rapidity of transit;" and an enlightened, native gentleman, a merchant in Calcutta, expresses himself as follows: "The growing class of intelligent natives would

* An annual fair, is held at Hurdwar in the month of April, at a certain spot on which Krishna stood, at the time Bagirut brought the Ganges stream into existence. The fair disperses immediately after the time appointed for the last purification, and the pilgrims carry with them to their homes, the sacred water of the Ganges.

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freely resort to it, (the railway) and lastly the religious connection 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." These are the sentiments of those acquainted with India and her people.

Notwithstanding the present gloom which hangs over railway property, its gradual development is best proved by the returns, which shew a yearly increase of more than one million sterling to the national income, from one thousand eight hundred miles of railway. When this fact is kept in view and the large sums that are lost in foreign loans, and home and foreign mines,* all who are interested

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* The Quarterly Review in one of its admirable articles on railways, gives the following summary :—

"The British capital invested in railroads—expensive if you will—but solid, enduring, vivifying works, is about £60,000,000. The capital risked, we fear, we might say lost, in foreign loans, is computed at not less than £121,000,000, whereas the £60,000,000 invested in our railroads, are not only represented by solid works, a substantial property, but pay on the average five per cent, that is, two per-cent more than the public securities of the state; to which may be added £6,484,000 of British capital, paid up on *foreign* mining speculations, described in Spackman's Statistical Tables, (p. 158), 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 in 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 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 £130,000,000."

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in India, cannot but be anxious to see some portion of our superfluous wealth, which is squandered with a prodigal hand both at home and abroad, directed to her shores, to commence a system of transit in that magnificent country, famed through all time for its inexhaustible riches, regarding which, the "Times" of the 25th of September, in its leading article, says—"The wonderful progress of production, and commerce in that country (India) encourages us to hope, for almost any result. * * * With regard to our East India trade, rashness consists rather in leaving things as they are, than attempting to develop its unequalled, and immeasurable resources," with a density of population in the Lower Provinces of Bengal and Behar, exceeding that of any country in Europe.

The introduction of that mighty engine of improvement, to which England is herself so much indebted, would cause the slumbering spirit of India, to awake from the sleep of ages, the sleep of apathy, superstition, and prejudice, to the knowledge of the value of time, and to assume among the nations, an aspect of renovated power. "Her (India) value will then shine forth, and those who consult her interests, must rejoice."

To the authorities in the India House, the author's best acknowledgments are due, for the uniform courtesy he has experienced; the liberal access af-

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forded him to valuable official records, has enabled him to place, in a condensed form, much that must be interesting, regarding the resources of our Empire in the East.

He has also, to express to many distinguished individuals connected with India, his sincere thanks, for valuable suggestions, and that encouragement, which has induced him to bestow additional pains on the edition now offered to the public, which he trusts, will be found more deserving of approbation than the preceding one.

London, October, 1846.

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INTRODUCTORY REMARKS.

When we reflect on the pre-eminence we have attained, as a nation, both for political sagacity and an enlarged philanthropy, the neglect with which we have treated, in some respects, our Indian dominions and subjects, cannot but be matter of surprise, if not of indignation; and this surprise is by no means lessened when England is regarded as the great centre of the world's commerce; her sons, wise, brave, and humane, yet ever in the van of commercial enterprise, with an energy of purpose which secures to them success, whether they pant and toil in the luxuriant fields of a tropical clime, or patiently, as fishermen, pursue a precarious commerce in the frozen regions of the north, where the womb of nature is for ever sealed.

We are, emphatically, a money-making and commercial people, and in this character, as merchants

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trading to the east, with our invoices and bills of lading of our wares, did we first, with anxiety and care, plant our foot on Indian soil, esteeming ourselves happy, if we received permission from the native governments to pursue our thrifty avocations in peace.

Without pausing to note the various phases in our career, till the character of merchant was merged in that of sovereign; we shall merely remark, that for many years our Indian policy has been—if we may be allowed a paradox—that of passive and involuntary aggression, extending only our dominion when we could not avoid doing so, and advancing our frontier as a means of defence. We thus, from the force of circumstances, have had a character thrust upon us, not our own; gradually laying aside our peaceful and profitable pursuits, and allowing our philanthropy to slumber, we have acted in the eyes of those, little observant of our peculiar political relations in the east, as if we lusted with an insatiable desire for territorial aggrandizement and military renown, but although now our empire is approaching with rapid strides (and, from the portents in the political horizon, will soon attain its natural and obvious boundary,) towards the north-west, to be defined, defended, and circumscribed by the Indus and Hymalaya, yet the British empire in the east, appears far from having ascended

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to its zenith ; and the time has now arrived to awake to new and other glories, more consonant to our genius as a people, the peaceful triumphs of commerce, from improved intercourse, bringing in its train the arts, the sciences, the literature, the civilization, and religion of the west, causing the barren waste to be fruitful, and the wilderness to blossom as the rose, the sound of the hammer to ring in the solitude, and the gospel of peace, to be proclaimed in the darkest recesses of that benighted land.

That the mighty engine of improved intercourse has not received that degree of attention, from the liberal and enlightened rulers of India, which it demands, is to be attributed, in a great degree, to the expensive wars which have been forced upon them—the delicate political relations with numerous states—the vastness of the territory to govern, and the comparative unacquaintance with some of the provinces, both as to their inhabitants and resources, and many other affairs claiming their immediate regards. By some it is injuriously urged, that the East India Company, acting as trustees for the crown, and from their charter expiring in 1854, they have no wish to invest capital in a country which it is possible, although not probable, they may be called upon to relinquish—and as their dividend is limited to 10½ per cent, they can derive no advantage from developing the resources of British India—that this

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aspersion is unjust, we feel assured—for, although there is much that is anomalous in their anthority and constitution, taking their administration as a whole, and making due allowance for the distance of the country governed, its vastness and difficulties, nothing could be more wise and generally beneficent.

If India has had much to complain of—of positive injustice, superadded to neglect, the odium of this injustice rests with us as a people, or rather with our representatives; for have they not, by legislative enactments, treated India more as foreign country but little favoured, than as the most magnificent and dazzling jewel of the imperial crown. In times of peace, India and its affairs have been too often treated with an apathy not to be accounted for, till some new victory—some new nation, little heard of before, or if heard of, not known, has bent its unwilling neck to our yoke; when the national vanity is flattered, its curiosity excited, and the Prime Minister of England declares, at once, the Sovereign's and the nation's voice in applauding and rewarding the victors. But whenever our connexion with India, was not adorned with a remarkable achivement, our ministers and legislators, unmindful of the tide of wealth which flowed from India to our shores, crushed the energies, and redoubled the labours of her sons, by unwise and unjustly exorbitant duties, on the fruits of those

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labours, and this gloriously free country held back with all the freezing rigour of despotism, the advance of a mighty nation, in whose hands an all-wise Providence had placed its destinies, in the career of social improvement, and suspended the development of the inexhaustible riches of its soil, by refusing to open its ports, excepting on the most cruel terms, to its valuable products. While so little reciprocating the nature of our dealings with India—when thus refusing its products—our own manufactures were poured into it, under a small and nearly nominal duty, to the annihilation of the native cotton fabrics once so celebrated, and the total disappearance at last, of all local manufacture.*

Restraining, with one hand, the free labourer of the East, they encouraged, with the other, the slave owner of the West.

The old sugar duties, must be in the recollection of every one. Jamaica sugar, although of superior

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* Note to 3rd. Edition—The Author is gratified to learn that influential parties connected with India, have had their attention directed to a hand-power loom recently patented in Great Britain by the Chev. P. Claussen, whereby the native weaver will be enabled unerringly to return to his employer, his produce equal in quantity to that of the Power-loom, and of a quality more even in texture than that resulting from Hand-loom labour. This in India, where labour is so cheap, raw material so abundant, and steam-machinery so expensive, will afford a favourable opportunity for resuscitating the ancient manufactures of that country.

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quality, and produced so much nearer England, paid a moderate duty ; while that from India, naturally less rich in quality and coming from so great a distance, was charged with a duty almost prohibitory. These errors are now partially repaired ; but time presses onward, and much is still to be achieved by the most enlightened, the most moral and religious government in Europe, to elevate, in the scale of nations, the people of India.

Let the liberality and energy of the future, in peace as in war, make amends for the past. A mighty element of civilization is now coming to our aid—the railway system of communication—the due development of which, in India is, at once, the most gigantic, interesting, and important problem, which the genius of the age has propounded to the world.

Its pressing and paramount importance cannot be over-estimated, whether in reference to a great and increasing commerce, or to the consolidation and protection of our dominions and the many blessings which would flow to the people from improved intercourse ; so that now, when our sword is sheathed, and the roar of our cannon has ceased to make our enemies tremble on their thrones, the eyes of the soldier, the statesman, the merchant, and the philanthropist, will be alike turned towards the gloomy recesses of Leadenhall Street, where it is hoped that this subject will be discussed

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with the consideration and promptitude it demands.

For the sake of brevity and distinctness, we now proceed to embody our remarks under separate heads; supporting our own views and assertions by testimony drawn from the best authorities, whether in India or in this country.

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POLITICAL AND MILITARY IMPORTANCE.

OF

RAILWAYS IN BRITISH INDIA.

The imperious necessity of rapid intercommunication in reference to our Indian possessions, in a political and military point of view, is so obvious, that it would be matter of surprise, were it not for the still more pressing claims on their attention formerly alluded to, that the authorities have not, long ere this, prosecuted the subject, with the assiduous and careful energy, which they have only recently begun to evince ; but the insult offered to our arms, by the invasion of the Sikhs, and the delay which

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took place before that insult could be avenged, must have effectually demonstrated to all, the impolicy, the impossibility of further procrastination, in summoning science to our aid, to take advantage of the natural facilities of the country—to bring what is distant near—the weak outpost, under the immediate protection of the great station, with its troops and military stores in its rear. During the late campaign against the Sikhs, nothing could be more apparent, than that our vast resources were for weeks unavailing, from the want of rapid transit; powerless to hurl back aggression, we were compelled to suffer, for more than a month, the presence of an enemy within our border, too formidable to be dislodged. It is true, that this indignity, offered to the majesty of the British name, is now almost lost in the completeness of the subsequent triumph; but, while we rested on our arms, waiting the arrival of heavy artillery, stores, and reinforcements; what might not the enemy have achieved, had he but possessed conduct and enterprise equal to his power. How wonderful the infatuation that he did not, with the first blow he struck, overwhelm Sir John Littler, and then attack, in detail, our wearied detachments as they came up under the Governor-General and Lord Gough, instead of reserving his strength, till it suited us to become the assailants in those memorable struggles.

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A recent Indian periodical* states that, "where it takes three months now, it will take only as many days, to bring distant consignments to market, and the same capital, consequently, which, at present, can be returned only three or four times a year, may be returned, probably, twenty. A railroad will operate in the same manner, increasing the effective strength of the army, by saving the time employed in marches. In the annual relief, infantry regiments are often moved from one end of India to the other, at an average of ten and a half miles per day, halting six days in the month, so that it takes about six weeks to move from this presidency (Calcutta) to Benares. Hence arises the necessity of the concentration at all times, of a large force in the neighbourhood of an enemy. There are not the means existing of concentrating troops on a sudden emergency. This was strikingly exemplified in various ways, on occasion of the recent war on the north-west frontier. When it broke out, all officers, whose regiments were in the field, were ordered to join the army. About one hundred, we believe, in the different services—Engineers, Artillery, Infantry, and Medical—required to go from this Presidency. They were sent at the public expence, and with the

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* *Calcutta Review* for March, 1846.

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greatest despatch. How many do our readers suppose the Post-Master-General was able to send daily? Three!—and as the journey took sixteen days travelling, night and day, few arrived before the war was over. Even this, could not have been accomplished at any other period of the year.

"Under the order, now countermanded, for the establishment of depôts, the Regiments stationed in the presidency division were ordered to supply about six hundred men to the depôt, intended to be formed at Benares. The utmost despatch was desired by Government; bullock hackeries, the only kind of carriage ever available here, were put in requisition in the usual manner; but the *garriwâns** had taken alarm at the rumour, industriously and perhaps maliciously circulated, that they were to go to the seat of war. They were consequently obtained with difficulty. Many ran away, and from these causes several days were lost before the march could commence, and a halt of some days more became necessary at the end of the first day's journey. Is this a predicament proper for the Government to be placed in, within a few miles of a great political and commercial capital? Is it just, to the great interests involved in the stability of British power, that the

* Drivers.

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movement of troops should depend on native opinion, or on the caprice of the drivers, or owners of bullock hackeries ?

" The chief magazine for the supply of military stores, for the forces employed in the Lower and Upper provinces, is and must be at Fort William for a century to come. Nowhere else can the vast munitions of war, required on occasions of hostilities, be safely deposited. Their safety is itself a cause of strength, in the impression which the knowledge of it makes on the natives of India. But their use depends on their transport, which, though more easily accomplished by water, than the transport of troops, could be effected with incomparably superior advantages by a railway. The magazines of Allahabad, Cawnpore, Agra and Delhi, from which a great part of the Bengal army is supplied, receive all their stores from Calcutta : those of Ajmir, Ferozepore, and Saugor, are so chiefly supplied from this presidency.

" Not only is transport by railroad the quickest, but if the saving of time is taken into account, it is the cheapest mode of conveying troops.

" Sir James Willoughby Gordon, Quarter-Master-General, was examined on this point, and gave his evidence as follows :—

" 1994. Then, in consequence of the saving of time which is effected, the total cost of the transport

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of troops is actually less to Government, than their expenses on the road, when they go on foot — Exactly, perhaps the better way would be, to state one case, which is as good as a thousand. We will take the distance from London to Birmingham ; the expenses for marching for one man, being nine marches and one halt, is 10*s.* 10*d.* ; by railroad he would cost 10*s.* 7*d.* ; therefore, in that distance, there is a saving of 3*d.* on each man."

1995. Lord G. Somerset.—" You are now speaking of cavalry?—No, infantry. Cavalry I have moved by railroad under particular circumstances, which, if necessary, I shall state ; but, so far as regards expense, the horse marching costs nothing ; he eats the same as he does in the barrack-stable ; but when a soldier marches, he costs the public, in addition, 1*s.* 1*d.* per day, of which 10*d.* goes to the publican, and 3*d.* to himself. Then, I should say, that this mode of railway conveyance has enabled the army (comparatively to the demands made upon it, a very small one,) to do the work of a very large one ; you send a battalion of one thousand men from London to Manchester in nine hours ; that same battalion marching, would take seventeen days, and they arrive at the end of nine hours just as fresh, or nearly so, as when they started, by moving the troops to and fro, by that mode of conveyance— you could not have done one tenth part of the work

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that it was required of the troops to do, and necessarily to do, in the year 1842.

1996.—"In the case you have mentioned, for the sake of example, of the conveyance of so many soldiers from London to Birmingham, it is obvious —is it not—that, besides the small difference between 10*s.* 10*d.* and 10*s.* 7*d.*, the soldier was available for nine days' service in this case, which he spent in travelling in the other?" "Yes."

1997.—"And over and above, that there is the power of concentration at particular points, the importance of which is hardly to be estimated?" "Yes; it facilitates military operations, to an extent beyond my power to describe to the committee."

Regarding the superior safety of railroad travelling, as compared with all other modes of conveyance, the same witness made the following statement:—

"For the last two years, ending December 31st. I have moved by railroad 130,174 persons, and of those persons a very large number were women and children, and they were moved without any reported accident whatever, which is a degree of security I do not think attached to any other mode of conveyance that has come under my observation, neither by canal, nor by sea, nor by waggon, nor by coach.*

* Vide—"Reports of a Select Committee of the House of Commons on Railways."

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In the month of November last this officer gave similar testimony, before the Gauge Commission, as to the economy, safety, and adaptation of railroads to military purposes.

He stated that during the three years and a half, ending the 30th of June 1845, 212,000 people were moved by railway, of which 9,600 were women, and above 1,100 children, beside 378 horses, without any reported accident.

The horses came out of the horse boxes, after a movement of 100 miles, just as fresh as when they went into them.

"6325. Do you imagine in the event of this country being at war with France, the railways of this kingdom could be advantageously used in the National defence?"

"Certainly. The effect of rapid communication by railway, speaking militarily, is, that it enables you to do with a small army the work of a large one."

After adverting to the great inconvenience and expense of having large bodies of troops quartered in different parts of the coast, as was the case at the breaking out of the last war, he adds—"Now it would not be necessary to do that; you would probably concentrate them in some central place and move them from thence by railway."

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"6337. You mean that they would not be concentrated upon any point of the coast?"

"No. At the breaking out of the last war, you had a large division of the army in Essex; you had another in Norfolk; you had another in Northamptonshire, and so on Northward. You had a very large one in Kent; you had another in Sussex; you had another in Hampshire; and you had one in Devonshire; all of which were separate and distinct corps, and could not be removed but at great expense of time and labour. Now in the event of similar circuumstances of hostility with France, it would be much better to concentrate all those troops in some central point, such a central point as might be thought best, and from thence they might be conveyed by railway, to any part of the coast where their services were most required, to and fro, with very great rapidity and certainty."

"6338. Taking the great lines as radii from that focus."

"Yes; the focus might be wherever it might be thought best. You might consider which was best, with a view to ammunition, with a view to proximity to an arsenal, with a view to provision, and with a view to the troops being quartered; they would go backwards and forwards without difficulty."

The military evidence of Major General Sir John Fox Burgoyne, K.C.B., Inspector-general of fortifi-

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cations—lately chief commissioner of public works in Ireland, and also one of the railway commissioners for that country, given before the gauge commissioner contains the following passages.

"6346. You are probably of opinion that the facility of moving artillery, cavalry and infantry, by railway, might be, in case of war, essentially conducive to the national defence?"

"No doubt of it, of very great importance. I look upon the whole safety of the kingdom to depend upon railways. The whole question of war depends upon the General who can concentrate his troops with the greatest rapidity, and in the greatest numbers, upon a given point of importance; and if you can get down your men from the North faster than the enemy can land them on the coast, of course you have every advantage."

"There is another very great facility that railways give, with regard to military operations, which is in carrying camp equipage. In case of war, camp equipage is of the greatest importance, and the carriage of it by ordinary means is very difficult, but by railway you would carry it with the troops very easily, and you would form an encampment very easily in a very short time."

"Then there is another great advantage in the railways in defensive warfare, which is, that the parties who are defending themselves, who are re-

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sisting invasion, have the use of the railways to the last; whereas, if the enemy gets possession of it, it is of no use whatever to him. Now in the case of ordinary roads, when an enemy got possession of a road, it was of great service to him; he immediately ran along it till he got to the next point of opposition. But when he gets possession of a railway, it is of no use to him at all; he has no carriages, and no locomotives; but you have the use of them, on the contrary, till the last moment. I look upon railways, to be important mainly for defence, and I think steam generally, is chiefly of advantage in favour of defensive power.

"I should expect all the reserves to be a long way in the rear, always having the facility of that rapid communication to various points. I would never trust in the front, more than what were necessary for immediate defence.

"The great reserves would all be in the interior.

"Along the outer circumference, troops attempting to assemble, might be met by the enemy and opposed in detail, whereas, from the interior, they have the advantage of concentration on their side, and may direct their masses on inferior forces.

"6336. Does anything further occur to you in respect to this question? I think that the point that Sir Willoughby Gordon mentioned about the security of railways in case of insurrection, is of

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very great importance. It is one that has always struck me with reference to the danger of having the railways broken up. If you had any apprehension of anything of the kind, you would have a flying corps upon the railway, which would run from one place to another; and anybody that attempted it would get into a great scrape; for you would be upon them before they could be aware of it. They might do partial mischief for a short time, but they could not keep any permanent hold of the thing, or do any such mischief, that your own people would not be able to repair in a short time."

That the important advantages of railways for the security and defence of *this* country, so forcibly pointed out by these two distinguished officers would result from the introduction of this mode of transit in India, must be evident to all, when the greatness of territory, the extent and nature of its frontier, and the numerical disproportion of the army to the population are considered, but only those who are practically acquainted with the country, its people and climate, its roads and conveyances can duly estimate the expense, delay, and annoyances which so frequently accompany the movement of even a single regiment in its line of march, and this too, in times of peace, but when forced marches become necessary, the carriage seized and retained by authority, even if adequate for the conveyance

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of camp equipage, is soon thrown so far in the rear as not to be available. The men and officers are consequently when making two days' march in one, constantly exposed, when in an exhausted state, from the want of their tents, to great heat during the day, and intense cold at night, and such exposure at the very opening of the campaign, deprives the ranks of many an efficient soldier. Railroads would entirely obviate or greatly diminish these difficulties, there would be no fatigue experienced, and but little exposure. The same train that would convey the soldier, would also convey his arms, his tent, and refreshment, so that an encampment of well supplied and efficient troops, might be formed in an incredibly short time, at any point where their services might seem to be required.

The following paragraph we subjoin is from a German Paper. "The late affair at Cracow, has afforded an instance of the benefits of railways for the speedy transport of troops and warlike stores to the scene of operation; an Austrian corps of 921 men having been transported on the 3rd instant, from Prague to Almutz, about 160 miles, in fourteen hours and a half; and on the 5th, a body of cavalry of 1500 men, with horses and baggage, made the same journey in twelve hours, thus saving from eight to nine days."

Colonel Warren, C.B., Town Major, Fort William,

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regarding railways in India, expresses himself as follows :—

"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, both upon 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 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, might 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 be by this means spared. Stores, would not to the same extent be required as the various depots, and the loss by decay, and the destruction

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incidental to the climate, which now attains, would also be avoided."]*

Many other officers in India, both in the Engineers and other arms of the service, coincide with the opinion of Col. Warren; but we confine ourselves to a short extract from the letter of Captain Goodwyn, Garrison Engineer, and Civil Architect of Fort William.

[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 the 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.]

In addition to the facts and opinons which have been stated, drawn from the evidence of the Quarter-

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* The above extract, is from the phamphlet of Mr. R. M. Stephenson, and in all cases where we have availed ourselves of the information contained in the same, the extracts are marked by brackets, as above.

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Master-General of the Army before a select committee of the House of Commons, the more recent testimony of that officer and General Burgoyne before the Gauge Commission, the Calcutta Review, and officers in the service of the Honourable East India Company, we close these extracts on the political and military importance of railways in India, by transferring to our pages the following corroborative testimony of Mr. Williamson, late Revenue Commissioner, Bombay, contained in a printed letter recently addressed to Lord Wharncliffe, as chairman of the Great Indian Peninsular Railway Company.

"In Europe the importance of a railway as a military work, is limited to the speed and comfort with which large bodies of troops may be conveyed to their destination; but in India its value is enhanced, by the mode in which it would *spare the health and save the lives* of European troops.

"The saving of human life and the increase of efficiency, in the men, would of themselves be a sufficient argument in favour of such a mode of transit; but setting aside all considerations of humanity, the mere pecuniary saving would be very great. It is well known, that every recruit landed in India costs the Company one hundred and ten pounds, which sum is considerably increased before he is dismissed from drill and fit for service, so

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that the saving of every single life, becomes a matter of considerable financial importance."*

The cogency of Mr. Williamson's remarks regarding the pecuniary advantage which would accrue to the state by the safe conveyance of troops, must be strikingly apparent to all acquainted with the tedious and dangerous navigation of the Ganges.

Three years ago, one hundred Europeans perished in this river during a gale, entailing a loss upon the government of upwards of ten thousand pounds.

It will have been seen in a preceding page, that the expense, delay and uncertainty of moving troops by land carriage on any sudden emergency, were strikingly exemplified during the last war.

Leaving these facts to the consideration of those interested in the stability of the British dominion in the East, and merely alluding to the great facilities which the government would derive from safe and rapid transit of their treasure and despatches, the comparative ease with which the present necessarily cumbrous machinery of government might be wielded or reformed, both for the administration of justice, and the collection of revenue in the more distant provinces, the stimulus that would be felt immediately in every department of the public ser-

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* Pages 11 and 14 of the letter by T. Williamson, Esq., C. S., on the advantages of railway communication in India.

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vice, by being brought almost into contact with the seat of supreme authority; the active and efficient supervision of which, would elicit more fully the highest and best qualities of their servants, improve the revenue, and be a blessing to the people.

Provided with this additional source of energy and strength, should an enemy again be rash enough to threaten our territory, he would find that territory surrounded, as with a wall of iron, bristling with British bayonets, our munitions of war at hand, and our guns in position.

Works so formidable to our enemies, so useful to ourselves, how calculated to impress surrounding nations with the intelligence, the resources, and the power of the paramount authority in India!

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THE SOCIAL & COMMERCIAL ADVANTAGES

OF

RAILWAYS IN BRITISH INDIA.

"There be three things," says Lord Bacon, "which make a nation great and prosperous, a fertile soil, busy workshops, and easy conveyance for men and commodities from one place to another."

"Railways are, assuredly, next to the invention of printing, the most powerful instrument of civilization that the ingenuity of man has ever devised. It is difficult, if not impossible, to foresee and define the results which they must, of necessity, at some period produce on the fate of nations."*

The knowledge of the value of time, the commercial benefits and social amelioration which flow from improved intercommunication, are now becoming generally known and justly appreciated, and it will

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* Address to the Chamber of Deputies by the French Minister of public works.

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not have escaped the observation of the attentive reader of history, that the march of nations in general improvement, enterprise, and the acquisition of riches, has been accelerated, or retarded, in a nearly exact ratio, with the means afforded them of exchanging ideas and commodities within their own territory, and extending their relations with neighbouring and more remote countries.

The means of transit, besides constituting a chief element in collecting data on which to base a true estimate of the progress of society, operate alternately as the cause and effect of civilization and prosperity. The formation of roads invariably tends to improve the most barbarous district, to evolve its resources and ameliorate the condition of its inhabitants, while the converse is alike certain in result. A country rich in agricultural, manufacturing or mineral wealth, with a people whose energies are awakened to the incalculable benefits which accrue to commerce, from the easy and rapid interchange of commodities, demands increased facilities of transit, taxing to the utmost, science, experience, and skill, to keep pace with its requirements.

The state of internal communication of a country then, bears a direct relation to, and is co-equal with, the progress of its people in general improvement, good roads and other means of transit being the infallible signs—because the certain consequences—

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of cilvilization—as their absence or imperfection proves the reverse in a greater or less degree. "Let us travel," says the Abbé Raynal, "over all the countries of the earth, and wherever we find no facility of travelling from a city to a town, or from a village to a hamlet, we may pronounce the people to be barbarians." Sir Henry Parnell, in his admirable "Treatise on the formation &c., of Roads," makes the following forcible remark—"The making of roads, in point of fact, is fundamentally essential, to bring about the first change that every rude country must undergo, in emerging from a condition of poverty and barbarism."

"By this means the village and the city are brought close together in effect, and yet retain all the advantages of their local separation; the port and the manufactory are only separated by the distance, in time, of a few hours, while such distance in space affords room for all the various occupations which contribute to the perfection of either."* A writer on this subject remarks that—"Next to the genial influence of the seasons, upon which the regular supply of our wants, and a great portion of our comfort so much depends, there is perhaps no circumstance, more interesting to men in a civilized state, than the perfection of the means of interior communication."

* M. S. Lectures on the "Rise and progress of internal communication," by an Eminent Civil Engineer.

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Vast, and beyond the calculation of the most sanguine as have been the benefits conferred on this country by railway communication, the introduction of this system of transit into India, must lead to results of still greater magnitude and importance. In England, this was only a question of degree; applied to India, it will be one of kind, or a new and vivifying element of social and commercial progression, acting on a population exceeding one hundred millions.* Capital and enterprize, directed by science, have for ages stimulated the industral energies of our people, and the latent resources of our soil; whilst the extensive and fertile plains of India, teeming with the richest agricultural and mineral products which—when remote from river traffic, from the want of roads—remain to rot on the ground which nourished them, or lie dormant beneath its surface, benumbing the energies and debasing the moral capacities of the inhabitants.†

"Great merit is due to the late Lord William Bentinck, for having established a few steam boats

* The entire population of India may be fairly estimated at 150,000,000.

† "If we had only a Railroad to distribute our produce we should do well; as we have none, an abundant harvest and plenty are almost as embarrassing and ruinous to the farmer as a dearth; produce, cannot be disposed of readily, and is parted with, at a very unremunerating rate to satisfy the demands of rent."—From the Indian correspondent of the Times, December 30th, 1846.

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on the river, and to the Home authorities, for having maintained them. It is ascertained, these boats afford a very profitable return; but their number, not exceeding six or eight, so far from being adequate to the conveyance of the traffic up and down the Ganges, are scarcely sufficient for the transport of the public stores, and troops proceeding to the interior.*

"A reference to the map of India shows that the cotton growing districts, on the Nerbudda, and those of Nagpoor and Amrowty, in Berar, are remote from Mirzapore, the entrepôt, on the Ganges, lying between Benares and Allahabad; and the mode of conveyance may be thus described:—

"The cotton is brought on oxen, carrying 160 pounds each, at the extreme rate, in fair weather, of seven miles a day for a continuance, and at a price of about five shillings for each 100 miles. If we take the average distance to Mirzapore at 500 miles, each pound of cotton costs in transit, above twopence-halfpenny. It has thence to be borne by water carriage nearly 800 miles further on to Calcutta, from which port the exportation of such

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* Since the above was written, several fleets of steamers for inland navigation have been established by private enterprise and with abundant success.—*O. I. Postmaster.*

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cotton to England as a profit must be looked for in vain. Within the last seven or eight years, a good road, between Jubalpore and Mirzapore, has been formed; and it is satisfactory to know, that although 400 carts only passed over in the year after it was built, no fewer than 6,000 went along it in 1838; and this number will daily increase. The misfortune of this road, however, as regards the cotton trade, is that it only commences half way between the cotton districts and the entrepôt. The article, therefore, has necessarily to travel 250 miles on oxen's backs, and the contract for conveyance extends to the whole distance; so that, in fact, for all beneficial purposes to the cotton trade in that quarter, this excellent road is almost useless. In order to render it available, it should be completed to Nagpoor and Amrowty. Were this affected, and the transport by carts substituted, as we may be sure it would be, it would diminish the expense of conveyance alone, from twopence-halfpenny to less than a farthing a pound. The calculation is simple. An ox carries 160 pounds at the rate of seven miles a day, *in fair weather only*, for a continuons journey of one or two months. In the absence of a defined and good road, a drove of several hundred head of cattle requires to be constantly watched, and prevented from straying on the march: and this leads to the necessity of travelling by day in the hot

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weather, when the thermometer is seldom less than 100°, and frequently 130° Fahrenheit. These droves are never so few as a 100, and often exeeed 1,000. Every morning, after daylight, each ox has to be laden; and before the operation is over, the sun is already high above the horizon. The cattle have then to proceed at the slow rate of two miles an hour; and seldom perform a journey of more than eight or nine miles per day. The horde generally halts one day in the seven. (Troops in marching on service, are required to halt once on every third day.*) If the caravan is overtaken by rain, the cotton, becoming saturated with moisture, is so heavy as to prevent its transport on the cattle, and the roads, if lying through the cotton ground, are so deep that men even, sink above their ankles at every step, and cattle to their knees. It may easily be supposed that under such a calamity, the merchant and the carrier are both ruined.†

Since General Brigg's pamphlet was written, the means of internal communication have been extended and improved, but still much remains to be done, for developing this essential element of prosperity and civilization.

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* In Bengal, in the annual relief, infantry regiments march on the average ten miles and a half per diem, halting six days in a month.—*O. I. Postmaster.*

† "The Cotton Trade of India," by Major General Briggs F.R.S. 1840.

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That the British merchants resident in India, as well as the wealthy and intelligent members of the native community, are alive to the commercial and social benefits derivable from railroads in India, will be evident from the subjoined extracts.

[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 current 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."—ALLAN DEFFELL & Co.

" 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 these are lines the advantage of which would be very great. For instance, from Rajmahl to Calcutta certainly, and probably the longer line between Calcutta and Mirzapore."—COCKERELL & Co.

" 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

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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."—KELSALL and GHOSE.]

Regarding the probable return to the shareholders on the capital invested, our Calcutta friends are equally sanguine.

[Notwithstanding the difficulty and delay of land carriage, from 19,000 to 22,000 tons of merchandize pass along the military road (per annum ?) It has been ascertained, that the expense of conveyance by land is equal to between three-pence and four-pence per ton per mile.

"By water the official returns from the Jungypore toll-house show, that 1,81,000 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 amount to about two-pence per ton, per mile on goods of the value of £40 per ton, or somewhat more than the *minimum* charge on a railway.*

* The minimum charge of a railway may be for coals and such rough goods, one penny and even three-farthings per ton per mile :—

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"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 enquiry 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.—G. ASHBURNER. (Firm of MACINTYRE and Co.)

Rate per mile for total charges for conveying of coal by.

	d.
York and North Midland per ton per mile . . .	2.
Great North of England	1½.

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"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 capital.

"The above is my deliberate opinion, formed after much careful consideration of the question."—Mutty Loll Seal.]

The following sentiments and anticipations regarding the moral influence of improved intercourse on the people, emanating as they do, from an

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intelligent and enterprising native merchant of Calcutta, Baboo Ram Ghopaul Ghose, cannot but be interesting.

["We are aware that the people of this country are generally poor—that the natives of Bengal are not a travelling people, and that the 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 Upper and the Lower 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 growing class of intelligent natives would freely resort to it; and, lastly, the religious connexion between the Hindoos and the holy city of Benares, Gyah, Allahabad, and others, would alone fill the trains with hundreds of the better class 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,

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let them be accommodated in separate 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, a 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 civilizing influence of steam."—KENSALL and GHOSE.]

The above opinions and hopes coincide with our own, although they are not those generally entertained. It must be allowed that there are many native gentlemen of considerable fortune resident in Calcutta, Moorshedabad, Patna, Benares, Delhi, &c., and a numerous and increasing class of mahajuns* in those cities, Mirzapore, and elsewhere, who would soon find it to be for their convenience and interest to travel by railroad, whether in the pursuit of business or pleasure, and the natives of the Upper Provinces, naturally given to travel, would speedily adopt the new system, were their prejudices duly consulted.

* Merchants.

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The introduction of railroads may be easily made to sub-serve agricultural purposes, by the formation of tanks where ground is required for embankments, and by the conveyance of water along the different lines; thus irrigation, the *sine qua non* of farming in the East, might be greatly extended, and those frequently recurring famines, in particular districts, arising from the want of water, would be either averted, or much alleviated.

Besides annihilating the hopes of the farmer, the deprivation or diminution in the supply of this necessary of life, in the scorching climate of India is the frequent and immediate cause of dreadful misery and mortality.*

Thus, in addition to promoting the march of civilization, the agricultural, and commercial prosperity of the country, the philanthropist regards the introduction of the railway system into India as, under Providence, the only means of saving the lives of thousands who fall victims to "the most primitive and most fearful of earth's scourges", and its concomitant pestilence, the horrors of which are greatly aggravated by the want of internal commu-

+ The author has to thank Mr. Williamson, for a copy of his letter on this subject, and the courteous note which accompanied it.

For further information, see letter on irrigation, by T. Williamson, Esq., late revenue commissioner, Bombay, addressed to Lord Wharncliffe.

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nication ; one portion of our widely extended empire in its period of desolation, supplicating in vain for assistance from the more favoured regions around, multitudes perishing miserably by famine almost in sight of fields yielding an abundant harvest.*

Prior to the introduction of locomotives on railways in this country, opinions were entertained precisely similar to those generally expressed, regarding the relative value of passengers and goods' traffic on Indian railways : the principal portion of the estimated profit being grounded on the latter.

" The unexpected and extraordinary increase in the numbers of passengers, however produced by the

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+ Some years ago, when the writer was in Upper India, a famine prevailed in the province of Bundlecund. The inhabitants, men, women, and children fled in hundreds from their homes ; many of these hapless creatures arrived daily at the great military station of Cawnpore, some to die of hunger as soon as they saw food, others in the first effort to swallow the coveted morsel. A camel-shed was given by the authorities for their reception ; a subscription was set on foot by " The Good Samaritan," the superintending surgeon of the Division, and with his own hand this kind-hearted man fed two or three hundred of these poor famishing creatures every morning. By this visitation, many children were left without a single relative ; several were seized by the rich natives and made slaves of ; but the military chaplain rescued about sixty orphan girls, whom he sheltered under his roof. These were afterwards educated, and formed an interesting and impressive group, all arrayed in pure white, on the day they received the sacrament of Baptism. They were afterwards to become teachers, for the conversion of the secluded inmates of the Zenana.

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economy of time and money, rendered the passenger' traffic more immediately and evidently profitable; hence, it naturally engrossed the attention of the managers, whose entire energies were engrossed to provide greater accommodation, combined with speed, safety, and regularity.

"Of late, the old established lines have increased the facilities for the carriage of goods, and provided accommodation apparently more commensurate with the demand. So far as the experiment has been carried, it has shown generally, that the net revenue from the goods' traffic, has been encreasing in a quicker ratio than the net revenue from passengers

"Late arrangements made by the South Eastern Counties for the more economical and regular carriage of goods, have caused an increase of revenue from that source of upwards of 100 per cent."

"But the most important field of all, because the most exhaustless, remains to this time almost unoccupied. I refer to the conveyance of agricultural produce and bulky materials, which are either conveyed by canals or common roads, or too frequently remain confined in districts where their value cannot be turned to the best public or private advantages."*

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* The Principle of Railway Management, by J. Butler William, Esq., F.S.S., F.G.S., read before the Statistical Society of London 16th. March 1846.

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The concluding paragraph of the above extract is in an especial degree applicable to India; and we now close this section with a few remarks on the general traffic of the country.

[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, with which they would 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

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* A Calcutta merchant, desirous of visiting Benares, distant 428 miles, incurs an expenditure of forty pounds and loses more than a month on the journey, there and back if he goes by steam vessels; and if he goes by Dâk (post) the amount will be fifty pounds, and he will have eight or ten days incessant travelling; by railway the time occupied, to and fro, would be under twenty-six hours, the cost ten pounds, seven pounds, four pounds ten shillings, or so, according to the class or train selected.—*O. I. Postmaster.*

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security afforded to the merchandize by the rapidity of the conveyance."

H. Goodwyn,
Garrision Engineer.]

The official records at the India House prove that the annual exports and imports of Calcutta by sea amounted in the year 1843-44 to near £15,000,000 sterling.* The chief portion of this great and still augmenting traffic is either received from, or conveyed to, the interior, by a most vexatiously slow and expensive mode of transit.† Without adverting

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* Vide Appendix H.

† By river craft moving, at the rate of twelve miles per diem, the charge is two-pence per ton, per mile, for goods of the value of £40 per ton, including insurance and interest. By land, moving at about the same rate, four-pence per ton, per mile; this is nearly double the average charge for heavy and bulky goods on the principal lines in England, and great reductions are still in progress.

Note to 3rd. Edition. The above are the usual-rates in Bengal. The steamers are more expensive, particularly for short distances.

The Madras rate for conveying Government stores by cart, is $5\frac{1}{2}$. per ton per mile.

The Bombay estimate for general merchandize by pack bullocks is from $4\frac{1}{2}$. to 11 per ton per mile varying with the season of the year and locality.

"The insurance from Calcutta to Rajmahal (distance 200 miles) is as high as from London to Calcutta; the loss of interest by delay and uncertainty of arrival; the injury done by damp and prolonged partial exposure to the weather—this, as in cotton, sugar, and salt, frequently occasions enormous loss—the loss from pilfering and waste, so great as 20 per

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to other products of the soil, (eighteen million acres being under cultivation in the north-west provinces) we may mention that to the north-west of Calcutta there are upwards of half a million acres devoted to the cultivation of the sugar cane, and in the year 1844, there were received in Calcutta from the interior, nearly 140,000 tons of sugar, which exceeds the estimated import for the current year, from the whole of our West India possessions, by 15,000 tons.*

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cent. in some articles; and also the robbery of the boats by gangs of river pirates. From these causes, the native merchants, *where roads are available, prefer paying 7d. per ton. per mile. This is the price of land-carriage in India, as stated in an extract of the Delhi Overland Gazette, published in the Morning Herald* of the 4th instant:—(December 1846).

"The average cost for conveyance of goods by land-carriage in India may be estimated at 30 rupees per ton (27¼ maunds) every 100 miles. By a Railway, at the ordinary rate of 2,88*d.* per ton per mile, at the average velocity, it would be 13 rupees per ton per 100 miles. Here, then, there would be an actual saving, in the mere cost of conveyance, of nearly 200 per cent., and this saving in addition to the other unnumbered advantages which increased speed affords." Letter by a shareholder, Smith Elder & Co.

* "The estimate I (Lord John Russell) now hold in my hand, I consider extreme, and by no means likely to be realized. It first states the amount of Colonial and free labour sugar in the warehouse:—

Colonial and free labour sugar in the warehouse, April 5th 1846.		Tons. 40,000.
Estimated import from April 5th 1846 to April 5th 1847 (Customs' letter):		
West Indies, ...	125,000.	
Mauritius, ...	50,000.	
East Indies, ...	80,000.	255,000

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The general commerce of the Ganges is estimated.

Calculated amount of free labour sugar admitted from foreign countries, ...	20,000
Making in the whole,	315,000
Probable stock April 5th 1847, stock being notoriously low	45,000
Availabie for consumption, ...	270,000

(Lord G. Bentinck) "His noble friend (Lord J. Russell) had also calculated the importations from the East Indies during the year 1846-47, at no more than 80,000 tons. Now he (Lord G. Bentinck) had reason to believe, from enquiries he had instituted, that importations to the amount of 109,000 tons might be expected, during the year from Bengal alone, independently of the importations from Madras. The exportations from Madras for the first three months of the last year, did not exceed 600 tons; but the exportations from that presidency during the first three months of the present year had amounted to 3,500 tons. He believed there was every reason to anticipate an importation of 15,000 tons of sugar from Madras this year; and if this were the case the defalcation in the supply occasioned by the drought in the West Indies, would be amply compensated by the increased supply from our East Indian colonies. The Right Hon. Gentleman the Chancellor of the Exchequer (Mr. C. Wood) seemed somewhat incredulous; but he would only direct that Right Hon. Gentleman's attention to the enormous increase in the production of East India sugar which had taken place within the last few years. In 1836 or 1837 the differential duty which had previously been maintained between East and West India Sugar was removed, and the duty on sugar produced in those colonies, was equalized. In 1836-37 the production of sugar in the East Indies for importation to this country did not exceed 13,000 or 14,000 tons. Ten years of protection had, however, so far encouraged the growth of sugar in the East Indies, that he believed our importations of that article from Bengal alone, during the present year, would amount to 100,000 tons."—"*The Times*" July 21st 1846.

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at from one million, to one million two hundred thousand tons per annum; and supposing that one half of this should be taken up by a railway at Rajmahl, it would, at one penny per ton, per mile with the usual deduction of forty per cent for working charges, give a net return of twelve and a half per cent. on an estimated capital of one million and a half, which might be required for the purpose of uniting Rajmahl with Calcutta, exclusive of passengers, troops, treasure, government stores, and the conveying of the mails.

That the commercial traffic of India is susceptible of great expansion, is demonstrated by the following statement contained in the Bengal and Agra Guide and Gazetteer for 1842.

"It may be remarked that the inland trade in general, has received a new impetus from the abolition of the transit duties in 1836. The tolls collected on boats at Jungypore, previous to that year, amounted to fifty thousand rupees; the year following, the amount was one hundred and thirty thousand rupees. This branch of the service has progressively increased."

During the last year the Accountant General of Bengal, has been publishing, in the Calcutta Gazette, a comparative register of the receipts and charges

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of the Bengal Government for several years preceding 1844-45.

	Receipts.	Expenditure.	Surplus.
1839-40	Rs. 7,19,41,586.	Rs. 2,19,56,352.	Rs. 4,99,85,231.
1842-43.	8,75,84,546.	2,62,75,151.	6,13,09,395.
1844-45.	9,52,21,640.	2,79,42,677.	6,72,78,963.

The above has reference to the finances of the lower division only of the Bengal presidency, and by the authority of state papers, we have thus a net revenue, after deducting the charges of the collection, the cost of production, the maintenance of public establishments, of more than six millions sterling.

This account, however, does not include the expense of the troops stationed in Bengal and Behar and other important items. If we estimate these charges at two millions, there will remain a surplus of income over expenditure, of more than four millions sterling.*

* In the charges of this presidency, there is one small item of 18 lacs of rupees or £183,000 put down as Nezamut charges, and we are anxious to fix attention on this sum as the origin of that extraordinary prosperity which the revenues of these provinces now exhibit. "This is the sum paid annually to the family of the Nizam of Moorshedabad, the former Viceroy of Bengal and Behar. Those who are conversant with the history of British India will remember that Lord Clive, on his last visit to Bengal, conquered those provinces from the Mahomedans, but left the administration of the

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The exposition of the state of the revenue in some of the provinces in the Bengal Presidency, contained in the money article of the Times of the 12th of May last is as follows :—

" Some very copious information respecting the finances of the lower division of the Bengal presidency, has been furnished by the last arrival from India. The great sources of revenue in the Lower Provinces, which embrace the Soobahs of Bengal, and Behar, and the districts of Cuttack, are six in number—namely, the land revenue, the excise on spirits, the stamps, the salt, the opium monopoly, and the customs : the receipts for the land revenue, in the financial year 1844-45, are stated at 3,71,00,000 rupees. The amount in the year 1841-42, was about the same, but more than an eighth of it, consisted of the arrears of former years. For the last four years, the income from this source has varied very little, and the permanent rent-roll is assumed to be about 3,70,00,000 rupees, which is

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revenues and of justice, with the Nabob whom he had set up. On his second advent, he was induced, by a view of the mischief of the double government, to simplify and improve the administration, by taking it out of the hands of the Moorshedabad Durbar.

" The result of this system we may sum up in a single sentence : under the ablest of the Mahomedan Viceroys, the revenues of these provinces never exceeded two millions and a half."

" *The Friend of India.*"

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about £500,000 sterling more than it was sixteen years ago. At the same time the expenses in collecting this revenue, have been greatly diminished. The excise on spirits, commonly called the 'abkaree' was more productive in the last three years, than during any previous period, having risen to 23,69,000 rupees from 21,70,000 rupees, the amount in 1841-42; the cost of collection having been also diminished. Stamps have not fluctuated, but the salt revenue, from some unaccountable cause, has steadily and progressively decreased. The profits of the opium monopoly, on the other hand, have steadily and progressively advanced from the year when Commissioner Lin accomplished his celebrated work of confiscation and destruction, which has resulted in giving the Chinese a keener appetite for the drug. In 1837-38, two years before that bold act, the profits had risen to the sum of 143 lacs of rupees, or nearly £1,500,000 sterling. The Chinese Commissioner at once reduced the receipts from this branch of revenue to £1,000,000 sterling, but since the settlement of the Chinese affair, a re-action has commenced, and last year the amount of revenue was above £1,750,000 sterling. The customs' revenue gradually increases. In the year 1836-37, the first since the abolition of the transit duties, the receipts were 36,04,000 rupees, and in 1844-45 they were 66,41,000 rupees, with less cost of col-

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lection. The receipts generally 1844-45 amount to 9,77,86,119 rupees, and the expenditure to 3,59,80,958 rupees."

If we assume two millions sterling, as the amount chargeable on the revenue for troops home department, &c., &c., there will remain, as formerly stated, a surplus of income over expenditure, of four millions sterling, derivable from the provinces under the Governor of Bengal. This portion of our territory is the most opulent and productive, as well as the most densely peopled* it yields we have seen a gross revenue of 9,522,164 sterling which nearly equals that drawn from upper India, and the two presidencies of Madras and Bombay, or the whole of the rest of the British Empire in the East.

So that, whether we desire the maintenance of a magnificent army, to uphold the power and dignity of our rule, or whether we are intent on cultivating the peaceful arts, by magnificent and Colossal monuments of our science and civilization, such as the

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* Population of Bengal and Behar.

Year	Area in sqr. miles	Population	Population per sqr. mile
1793	144,762	24,000,000	165
1843	„ „	48,007,061	336.

Rate of increase per cent. 196.
Population of Great Britain by last census, per sqr, mile, 240.

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Ganges Canal now ordered to be completed, and the Great Bunds on the Godaverey River, by which a vast, arid, and unhospitable desert, will be clothed with verdure, and fruitful fields; the resources of war, and the materials for building the Temple of Peace, are alike drawn from the two provinces of Bengal and Behar.

Hence the necessity is apparent, for guarding and cherishing the revenues of these two provinces, if we would extend, or defend, consolidate or improve our Eastern dominions.

The Bengal presidency, therefore, from the vastness of its territory, the superior richness of its products, the greatness of its commerce, the density of its population, surpassing that of any country in Europe, its pre-eminence in political and military importance, as the seat of the supreme authority, whether civil or military of the state, and the knowledge, that it was selected as the field, for the first essay of steam communication in the East, have naturally led us, to dwell more at length, upon what relates to it,—the chief presidency—than, to the Subordinate Governments of Madras, and Bombay

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Population of the three Presidencies, extracted from Parliamentary returns.

Bengal (including N.W. Provinces) . . .	69,710,071.
Madras (including Tributary states) . . .	18,314,605.
Bombay	6,940,277.
	94,964,953.

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GENERAL POLICY, MANAGEMENT, AND TERMS OF CONCESSION.

Three propositions suggest themselves as to the policy to be adopted, and agencies to be employed in the formation of railways in a new country.

1st. That they be, with certain restrictions and provisions, left to unfettered, and unaided private enterprise, as has been hitherto the case in this country.

2nd. That the government itself should project and define a great and comprehensive system, as well as execute and work the lines, most apparently conducive to the common weal, as in Belgium.

3rd. That the government should grant concessions or leases of various sections, or particular projects, to private companies, on such terms as might be mutually advantageous: the latter to have the execution of the works, and the management of the traffic of the lines, under the direct supervision and control of officers appointed by the government, as

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has been practised in France, and more recently in Belgium.

Judging from the confusion which has arisen in this country, by giving the reins to speculative enterprise, the crude and angular manner, in which railways were commenced in France, and the harmonious and beneficent manner in which the Belgium system has resulted, there appears to be little doubt, but that it is the most effective and rapid mode of introducing railways into a country. We would, however, from financial considerations, deviate so far from this example, as to give, after defining the line, the concession to a private company, for Belgium had to borrow money at five per cent, to make railroads, which did not, till very lately, yield more than two and a half per cent, and Pensylvania, which in 1824 was bitten with the improvement mania, "believed, and truly, that a system of inland communication by means of canals and railroads, would tend to increase her prosperity. She believed that the annual income of these public works, would not only pay the interest on the first cost, but would leave a liberal overplus for public purposes." What was the result? The state, after having spent millions, wisely gave away the works in an unfinished condition, to companies of private individuals, on condition, that they would finish them. In addition to this, the favouritism and speculation, inseparable from

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government patronage and expenditure, served to swell the costs of these works to a most disastrous extent. The consequence was, that in 1841 or 1842, the state was forty millions in debt. State lines can neither be worked with the same economy, nor can they have imparted to them, that impulse which the spirit of private enterprise alone can give.

Regarding the management of the different companies, it has been suggested that an amalgamation of the lines would be recommended or enjoined by authority. An amalgamation of interests we think essential, so as to remove all fear of competition, which would, at present, be both premature and injurious, and by allotting to each of the companies, (their priority and claims to public confidence being duly considered) a certain portion of the several approved projects, all tending to produce an uniform and harmonious system, they would mutually co-operate and stimulate each other, to bring their respective tasks to a speedy and satisfactory conclusion ;* and when concluded, the different managements, would be a check upon each other, and a mutual aid by their several experiences ; by a friendly rivalry, they would endeavour to meet the requirements of government, the accommodation of

* The Great Western of Bengal, might be required to complete the line from Calcutta to Rajmahl, and the East Indian, to proceed with that from Allahabad to Delhi and the Sutlej.

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the public, and the interests of their shareholders. While the different boards could, by acting in concert, either by exchanging Directors, or amicable adjustment, establish a uniform tariff for passengers and goods, so essential to the working of a continuous line of railway. The proceedings of all the boards, being under the supervision and controlling power of officers appointed by the Indian government.

It is now generally admitted, that although theoretically, unity is strength, yet, that the practical effect of amalgamation, carried beyond a certain point, is rather detrimental than otherwise, to the management of working railroads, and that all the benefits derivable from unity of action, are secured to the public by the clearing house system of the bankers of Lombardy, transplanted to this country and elsewhere, and now applied with as perfect success to the interchange and re-adjustment of railroad carriages and trucks, as to bank notes and cheques.* Should it, however, be considered that the traffic in India, so simple in its nature, and likely to continue so for many years, would be in any degree retarded or encumbered by having several boards of Directors, it must certainly be conceded that there ought to be

* Vide Appendix A.

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both in London and in India, a separate management for each presidency, but all acting under a common code of laws and regulations, to be settled by authority, and when the three distinct systems of Bengal, Madras and Bombay, begin to approximate and interlace, then the exchange of Directors or the formation of a sub-committee, composed of the chairmen of the three companies, would answer the purpose of imparting a uniformity of action to all. The latter mode, would facilitate and simplify the necessary correspondence with the authorities, or officers appointed by them to supervise the proceedings of the several railway Companies.

That the Boards in London should consist of those acquainted, and in some degree identified, with the particular Presidency they propose to traverse with railroads, is evidently most desirable, and that they should receive the active co-operation of capitalists and merchants of acknowledged status and business habits, is equally apparent. On this point Mr. Arbuthnot makes the following judicious observations. "It appeared farther to those parties who took an interest in the subject here, that the conduct of associations for introducing railways into the different localities required in India, would be much more efficiently discharged, were they to be undertaken by parties personally conversant with

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the different localities, aided by the co-operation of gentlemen in this country, more conversant with English modes of transacting business, than gentlemen who have passed a great part of their lives in India, can be expected to be."*

The local knowledge of the one, would guard against an injudicious selection of a line, and the known wealth and business habits of the other, would impart to the association, strength and efficiency; with such a combination, the English shareholder would feel assured, that his capital was judiciously and safely embarked, and turned to the best account that the circumstances of the undertaking admitted of.

That the energies of capitalists, require the guidance of local knowledge, is very apparent, from the appearance of an association, formed for the purpose of making a railroad, to a shifting village, which, every now and then transplants itself to the extent of some miles, according to the caprice of the river. This scheme (the Northern and Eastern) has been formally condemned by the Railway Commission, in Para. 19 of the report, nevertheless the prospectus has been published in Calcutta, and we

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* Letter of T. A. Arbuthnot, Esq., chairman of Madras Railway Company, to the chairman and committee of the Chamber of Commerce, Madras.

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are informed that the promoters are only biding their time to take English capitalists by storm.*

The representatives in India of the different companies having a deputed authority, should always remain subordinate to, and removeable by the London Boards. The propriety of this, is universally admitted in India; the organization of its society, its state of transition, and the experience of the past, appear to render such an arrangement indispensably necessary. On this point the Calcutta Review of March last remarks, "We regard it as a principle, universally applicable to all proprietory institutions, that those who supply the Capital, should have either the management, or an effectual voice in the management, and this principle has generally been acted upon; even Indian Companies scarcely possess an exception. The affairs of the

* "All the objects, as appears to us, of the Northern and Eastern are, or may be, comprised in the larger views of the Great Western Company. And probably it (The Northern and Eastern(will have to alter its plan as respects its Upper terminus (Bhagwangola), as the course of the river hereabouts is so uncertain that one year the company might find itself, rails and godowns (warehouses), in the bed of the river, another year, some miles distant from the channel where the craft would have to unship their cargoes."—Calcutta Review for March 1846:

"The great mart at Bhagwangola is of so unfixed a character, from the extensive and continued changing of the bed of the Ganges, that unless its continuation Northward

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East India Company itself, when it was merely a commercial body, were exclusively managed by the Directors in England. The Oriental and Peninsula steam company, one of the most successful concerns connected with India, manages the Indian branch of its great business by means of an agent selected on the ground of personal confidence in him, and he is strictly governed by the orders or instructions of directors in England."

It remains to say a few words on the conditions and stipulations, which, in justice to the government and the shareholders of the successful companies, ought to be observed in the concession.

The successful company will be incorporated by a charter, granted by the supreme government, and the Court of Directors will concur in applying for a similar charter from the crown, conferring on the railway company the requisite powers.

It is to be expected that the government will include in the concession, or grant, all the land necessary for the railway, and afford the necessary protection to the works till their Completion.

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and Eastward be considered desirable, it would appear that a branch to Bhagwangola, simply to accommodate the trade that now passes along the Ganges to Calcutta by the Sunderbundes route, will not be found to answer as a commercial speculation —" Report of Railway Commission.

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The proceedings of the company ought at all times to be open for the inspection of government.

That the government should have the use of the line, on payment of an equitable remuneration, and induce companies to have a large stock of trucks, platforms, wheels and axles, which in case of emergency, any common carpenter could raise a superstructure upon, and thus place many additional carriages adapted for the conveyance of troops at the disposal of government.

The general rates of conveyance, to be fixed by mutual agreement between the government and the company. Of course, there will be other clauses beyond these just hinted at, touching penalties for non fulfilment of contracts, and as to whether or not the line should, on settled terms, become eventually the property of the state. These and such like stipulations, demand serious consideration both from the government and railway companies.

We take it for granted, that no company would be rash enough to undertake a work of such magnitude, and at so great a distance, as a railroad in India, without such a guarantee from the government, as would enable the Directors to call up their capital without difficulty or hesitation, on the part of the shareholders, the majority of whom, being in England, are necessarily but imperfectly acquainted with India and its resources; indeed were the Directors

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of a company disposed to act otherwise, they would soon discover, that the entire change which has taken place in the public mind, regarding speculative enterprise, would render such attempt abortive, irrespective of the merits of the undertaking, and thus nullify the wishes and the hopes of the government and the people of India.

In considering the amount of the minimum rate of interest to be guaranteed on the expended, or paid up capital of a company, some regard ought to be had to the prevailing rates in India, both as to government securities and private investments, as well as those ruling in this country. By recent accounts from Calcutta, the banks paid 6 per cent on deposits for three months, and charged 10 per cent on loans of short date, although secured by deposits of government paper; and the bazaar rates ranged considerably higher. In England, the capitalist can command at present 5 per cent from railway companies in actual operation, and to this amount the opinions of bankers and merchants in the City, whom we have consulted, converge as the proper amount for a minimum guaranteed rate of interest for Indian railways.* This would be merely a

* Should there be no stipulation as to the number of miles of railway to be executed for the capital guaranteed, or no clause in the concession involving forfeiture to the state of part or whole of the capital actually expended, in the event of non-completion of the contract on the part of the railroad company,

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nominal guarantee, so far as government is concerned, if the lines be properly selected, as the statistical data, show a good's traffic, more than twice the amount;* and if the principle of low charges deduced from the practical working of English lines, be applied to India, the return would, we feel assured, be enormous.

But we would rather appeal to the wise and beneficent government of India, on other and more generous grounds, and take leave of this topic in the words of The Irish commission, men alike distinguished for learning, ability and enlarged patriotism. "Thus, although a railway itself, as a mercantile speculation, might not, at once, fulfil the sanguine expectations of the projectors, it would be an invaluable source of general wealth and prosperity."

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of course a smaller per centage would suffice, even for the first project to be completed, the guarantee of the East India Company being equivalent to that of the Royal Government, and given with the sanction of the latter. Should the charter not in 1854, the territories of the Company lapse to the crown, be renewed subject to their debts and liabilities,

Note to 3d. Edition...Since the above was published a loan at 5 per. cent has been opened in India.

* The Rajmahl Canal Committee prove, from the existing traffic of the country, that, "the total amount of tonnage daily passing through it (the canal) would not fall short of 3,000 tons, on which a toll of 6d. per ton would give an annual income of upwards of 58,000*l.*, which would be a return of 14½ per cent. on the estimated outlay. As a government work, the boats conveying troops, government stores, salt, and opium were not considered.

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COST OF CONSTRUCTION, &c.

According to the Report of the Railway Commission in India, the country generally presents, from the evenness of its surface, remarkable facilities for the ample development of the new system of inter-communication; from this circumstance, and the abundance, and cheapness of labour and materials, the cost of construction will be much less, than in our most favoured lines in England ;* and besides, the government having the power of taking at a small valuation, the land necessary for public roads, there will be no refractory land-owners to deal with, nor any protracted and expensive parliamentary contest, to fritter away the funds of Companies.† This

* Vide Appendix (B) & (C).

† The expenses of English railways may be divided into :—Parliamentary—Land and compensation—Works—Permanent way—Engineering—Law charges—Land valuers—Stamps for debentures—Office expenses, &c. Applied to India, one half of these items may be struck out.

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arrangement, besides, its economical effect, will have others of a highly beneficial nature; the natives would be generally impressed in favour of an undertaking thus sanctioned, and supported by the government whose mandates they revere.

The two physical difficulties which have weighed most, with those acquainted with India, and which are peculiar to the country, are, we believe, now entirely set at rest: viz, the periodical inundations and ravages of the white ant.

As to the former, their effects have been experienced and provided against, there can be no ground for apprehension on that head.

Regarding the destructive ravages of the white ant, the injury to be apprehended has been much exaggerated, we do not anticipate any bad effect from this insect, further than attacking temporary wooden sheds, or buildings; we have no recollection of the white ant making an impression on anything which was liable to motion, concussion, or vibration. The insect, protecting itself under a covered way, of earthy matter, which it throws out as it advances, we imagine that the disturbing, tremulous motion given to the sleepers, by the advance of a heavy train, would effectually deter its attack, or, if not, speedily dislodge the enemy, by destroying his covered way; besides stone or, Reynolds' cast iron sleepers, might be used for sleepers instead of wood,

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or the latter might be fortified, by means of one of those recent patent inventions, which have been found successful in imparting to timber, preternatural hardness and durability.*

Timber of excellent quality, is plentifully distributed over the country, and may be had at a cheap rate; in some places, almost for the expense of cutting. Teak, Saul, Sissoo, Soondree, and Babool, (a species of Mimosa), from their resisting the white ant, their durability, and their abundance, will probably be selected for sleepers.†

The soil being admirably adapted for making bricks, they may be commanded to almost any extent, in almost any locality.

Coal and iron ofexcellent quality, abound in many parts of India, and also stone well adapted for building purposes.

A reference to Appendix (B) will show the cheapness of labour and materials.

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*Sir William Burnett's invention preserves wood against rot and the ravages of insects.

† Teak is well known for its solidity. hardness and durability, as the most valuable timber of almost any country—but it is expensive; Sissoo also commands a high price in Calcutta, and has, although not so frequently as teak, been used for ship building. It is dark, coarse grained, and possessed of great tenacity.

Saul is less expensive in Calcutta than the former, is coarse grained, a degree less hard and tenacious than Sissoo, but bears exposure rather better. It is very abundant in the

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The average cost of railways has been,

	Per mile.
In England.	about £31,000.
In Scotland.	22,000.
In Ireland.	22,000.

(Vide Porter's "Traffic Returns" statistical journal, vol. vii. p. 176.)

In Belgium, ... about £18,000.*

(Vide "Report of Statistical Bureau," Delaveleye, Brussels, 1844.

In France, ... about £41,000.†

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broad belt of forest at the base of the Himalayah, and in the hilly regions in other parts of the country, where it may be obtained for almost a nominal price.

Soondree is peculiar to the Sunderbundes and the Upland district, to the west of Calcutta, and excels all the forest trees of India in the density of its fibre, in toughness, in durability when exposed, in strength or resisting power,* and its acidity gives it a perfect immunity from the ravages of insects. It never attains a great size and is occasionally contorted, but sticks adapted for railways sleepers, i. e. of 8 or 9 inches scantling are to be had in any quantity at a cheap rate, it makes good buggy shafts, but English workmen object to it as it turns the edge of their tools. A large quantity of this wood may be seen at the London Docks, or a specimen at Messrs. Roberts and Millitchell's, Old Jewry Chambers.

Note to 3rd. Edition. The iron-wood of Arracun, strongly recommended for sleepers in the Report of the Railway Commission, abounds in the forests of that region.

* "The cost of the West Flanders lines will not amount to one half of the average cost of the state lines per mile." Second half yearly report of the Directors of the West Flanders Railways, July 3rd. 1846.

† This we believe to be a typographical error, the cost per mile being £21,000 instead of £41,000.

* Vide Appendix D.

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(Vide Claudel's "Aide Mémoire des Ingénieurs," p. 455. Average of five metropolitan lines.)*

In Germany, according to Legoyt, £10,940.

In America, . . from £1600 to 9,400.

Average for the rougher sort, including stations for a single line of Rails, . . . £2,812.†

Estimates for India, average expense according to Vignoles, £7,500 to 10,250.‡

" Captain Goodwyn, for the Mirzapore line exclusive of plant, ... £3,000.

" Captain Western, for the Rajmahl line . . . . . 4,400.

Estimates for Great Indian Peninsular (exclusive of plant) on American plan, £3,000.

Present estimates for a quality equal to the best English lines, ... £11,000.

Original estimates for the East Indian line (Calcutta to Mirzapore) . . £8,000.

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* Principles of railway management by J. Butler Williams, Esq., F. S. S., F. G. S.

† For the mode of constructing railways in America. See "Weale's Ensamples of Railways."

‡ The line from Calcutta to Mirzapore, if executed in the manner proposed, by the Railway Commissioners, may be estimated at. . . . . £20,000 per mile.

From Allahabad to Delhi, ... 8,000.

From Calcutta to the Sutlej it would be an average of from . . . . . £12,000 to 15,000.

And would require a capital of, about £18,000,000.

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Estimates from actual survey of the line
from Calcutta to Delhi . . . £14,000.

It is stated in the report of the Irish commission that Railways might be constructed in that country, at the rate of £10,000 per mile, "The Board of Trade in their report on the South Western District, in 1845, states that the lines proposed to be made in that part of the country, might be constructed for about £12,000 per mile; and the estimated cost of the mass of new railways projected during the last two years, ranges, with few exceptions, between £10,000 and £25,000 per mile."*

Mr. Butler Williams declares, that the opinions of engineers and of statists agree in establishing, that the lines to be henceforth constructed, will on the average, approach more nearly to the lower than the higher standard.

It must be borne in mind that no just idea can be arrived at, of the cost of a railway, from the gross amount per mile, irrespective of other circumstances. The difference in the value of land and house property, and the magnificent ideas of our Engineer, forcing us to make monuments to their genius and taste in our termini and stations, are important elements of cost. On the Liverpool and

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* "Defects of the English system of railway legislation," by James Morrison, Esq., M.P. (Longman, 1846. Page 13.)

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Manchester line, thirty miles in length, the buildings cost £280,000. The Euston extension of the London and Birmingham Railway, little exceeding one mile in length, cost £255,722, the gateway alone, costing an enormous amount. (£70,000).

The court of Directors have wisely ordered their railway commission in India, to refer for information and guidance as to the construction of railways, to the experience of America, as well as Europe.

We think it highly probable, that by eschewing what is only ornamental, and improving upon the American system, we might effect an extensive railway development in India, at much less cost,* and better

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* Take for example the Rajmahl line which has been minutely surveyed, "the earthwork in the line proposed would be very little, and I think. I may safely say, that the earthwork and ballasting for the rails, will be much the same as the construction of the Grand Trunk road in India, which consists of an earthen road thirty feet wide, on an average three feet high, with a portion sixteen feet wide metalled, the metalling being one foot deep; the cost of the trunk road including the small bridges, but exclusive of the bridges over the large rivers, and Engineer officers' salaries, is under 2,500 rupees, a mile; the fencing which must be strong enough to keep out cattle, will cost 1000 rupees a mile. The large bridges, will be a heavy item which cannot be estimated without a proper survey of the line, but if laid down at 2,500 a mile will, I think, include every large bridge required over the Ganges, Soane, and all smaller rivers—making altogether 6,000 rupees a mile for works.

"The permanent way, meaning the sleepers and rails, cannot be estimated to be done cheaper in India than in England. The sleepers will require to be Kyanised, but if Kyanising is

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adapted to the rougher work it would be subjected to—than by attempting to transport a Birmingham or Great Western, with all their grandeur and complicated arrangements, into Hindostan.

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not found to resist the white ants, it will be necessary to use stone blocks, or perhaps to use Reynolds' cast iron sleepers) and their cost will be two rupees each, and as 3,520 are required in a mile of double line, the cost of these will be 7,040 rupees a mile; the rails should be of the full weight of sixty five pounds to the yard, and the cost will be £12 or 120 rupees a ton, making 24,600 rupees a mile; then the chairs, pins, and wedges for fastening down the rails, and labour in doing so, about 6000 rupees a mile, making a total of 37,640 rupees a mile.

"The remaining item of Engineering and surveying would be very small, and might be put down as 630 rupees a mile. thus making for the total cost of the railway:

Work	6,000	rupees per mile.
Permanent way	37,640	„
Engineering and surveying . .	300	„
Total	44,000	„

Report on the application of railway communication in India, published in the Calcutta papers by Captain Western.

To complete Capt. Western's estimate per mile, the following items must be added:

As per Capt. Western's Estimate	Rupees 44,000	£4,400
Termini, stations, and buildings, ...		300
Land and compensation, ...		100
Working stock, ...		1,000
Superintendence, &c. for three years		200
Miscellaneous, ...		500
Total.		6,500
Allowing an ample margin for contingencies, say, per mile, ...		8,000

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CLASSIFICATION

OF

PASSENGERS, &c.

"It may be interesting to compare in some particulars the working of our railways with those of Belgium, the only country in Europe, besides our own, in which such works have hitherto been carried on as a system, and where the results have been published.

At the end of 1842, there were in operation in that kingdom, 282 miles of railways, the average cost of construction of which was £17,120 per mile, while the average cost in this kingdom has been £34,360,* or just double the cost in Belgium.

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* Those lines principally used for transporting coals and minerals are not included in this average. O. I. P.

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This difference results from a variety of causes. In the first place, the works being undertaken by the government; there were no expensive parliamentary contests, no opposing interests to be bought off, no unreasonable compensations to be paid for land; and from the nature of the country, there were comparatively few engineering difficulties to be overcome. Besides these circumstances there has been much present saving effected in the manner of executing the works, which have been performed in a less perfect manner than would satisfy the magnificent ideas of our engineers.

The number of passengers conveyed along the various lines in Belgium, in 1842, was 2,724,104 or 662 for each 1000 of the population, the proportion in the united kingdom having been in the year ending 30th of June, 1843, 879 for each 1000 inhabitants, or 33 per cent., greater than in Belgium.

The proportions using various class carriages were :—

	In Belgium,	In the United Kingdom.
1st. class,	9 per cent.	19 per cent.
2nd.	25.	51.
3rd.	66.	30.
	100.	100.

The receipts from passengers during the year, were,

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in Belgium £187,372 or one shilling and fourpence. halfpenny per passenger, against two shillings and twopence three farthings in the United Kingdom. The proportions in which the receipts were contributed by the three classes of passengers were :—

	In Belgium.	In the United Kingdom.
1st. class,	23.	45.
2nd.	25.	42.
3rd.	52.	13.
	100.	100.*

It will be seen by the preceding tables that the majority of travellers in the United Kindom take the second class, and in Belgium the third class; the actual receipts for the third class in Belgium being more than equal to that drawn from the first and second classes combined, and we are convinced, that, although any payment is beyond the means of the artizan or labourer of India, yet, (as we have elsewhere stated,) there is a large and thriving population of merchants and smaller traders in the great

* An examination of the returns made by the various railway companies of the United Kingdom, with respect to their traffic, during the year ending 30th of June, 1843. By G. R. Porter, Esq., F. R. S. Treasurer of the Statistical Society of London. *(Journal of the Statistical Society of London, for June* 1844.*)*

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cities of India, that would avail themselves of these classes of carriage, were even the average English rates of conveyance adhered to.* Mr. Laing com-

* Note to 3rd. Edition. In addition to the classes mentioned in the text, a considerable income may reasonably be expected from the more wealthy pilgrims, as mentioned in a former section; and besides, it appears probable, that the native soldiers would gladly avail themselves of railroad communication, when on furlough, were the fare made sufficiently moderate.

The Report of the Managing Director of the East Indian Railway Company contains the following interesting and important paragraphs illustrative of what we have advanced in the above and in preceding sections.

"Communications have been received from Officers in the service to the effect that among their own Native troops, the expectation of facilities being afforded by which they could more frequently obtain leave to visit their families, has become a subject of constant conversation and interest among them.

This may, perhaps, be the more readily understood by its being mentioned that of 160,000 Native troops in the Presidency, one fifth, or an average of twenty out of each Company of one hundred men are always absent on leave—that this leave averages five to six months—and that on their return other twenty men are allowed to leave. One fifth of 150,000 men are thus leaving and returning four times in the year, viz., one-fifth leave and rejoin in the first six months, one-fifth more in the next six months, and four several journeys are therefore made by one-fifth of the whole number annually. One-fifth of 150,000 = 30,000 × 4 = 120,000 men, annually proceeding to or from their regiments home. Their pay averages sixteen shillings a month, and during absence thirteen shillings. The average absence at present is five months, of which three are spent upon the road, and two at home. Each man loses fifteen shillings by difference of pay, in addition to his cost of living while travelling, at least an anna (1½d) a day, or about eleven shillings—together, twenty-six shillings.

The travelling arising from Pilgrimages is a source of income which, although it will at first unavoidably swell the

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putes the average distance travelled by each passenger in this country at thirteen and one eighth miles, for a fare of two shillings and twopence three farthings, while in Belgium the average distance travelled, is stated to be, seven and three quarters leagues, or about nineteen miles, for one shilling and four pence halfpenny.

Regarding the arrangement of the different classes, and the relative fares to be charged, we must be guided in our calculations by the peculiar state of society in India—we should have five distinct sets of carriages, divided, as follows, one, appropriated to the conveyance of Europeans, the civil and military officers of the state—two, that is, a first and a second class, for the Mahomedans, and the same for

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coffers of the Railway Company, will, eventually, it is to be hoped, give place to a widely different order of things.

The subject is one in which it is not the province of a public Company to interfere, in any way; but there can be little doubt as to the influence which the social changes in contemplation in India will exert over the minds and opinions of all classes.

At Gyah alone there are about fifteen thousand Priests supported by donations, of which one Rajah (Bettiah) is next year expected to present Forty Thousand Pounds, and to proceed in pomp to perform his part in the pageant.

The Riots in the Gyah jail in September last, when forty out of fifteen hundred prisoners were killed, is one of the many instances indicative of the urgent importance of being able to obtain the prompt services of the troops, which, on the occasion referred to, were not rendered available for some days afterwards, although stationed at a distance of only sixty or seventy miles."

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the Hindoo portion of the people, with due provision for the conveyance of their females, the carriages suitable for the natives could also be made available for the conveyance of troops, both European and native.*

With the exception of troops, there would be scarcely any European travellers, but those going by the first class carriages, and as they would be public servants, proceeding or returning on duty, or on leave of absence, there would be little probability of reduction in the fares greatly augmenting their numbers.

The charge should have reference to the expense of travelling by Dâk (post), by steamers, by Budgerow, and marching, and it is to be borne in mind that to this class time is in reality money. For instance the staff, and command allowances of the staff and regimental officer, determine on the day on which he is relieved of the duties of his office, and re-commence on the day on which he reports his arrival at the Head Quarters of his division or regi-

* Although it would be necessary and proper on the first introduction of a new mode of transit to consult the prejudices of the native community, we are persuaded that the minute subdivision of the people recommended above would soon be quite unnecessary, as at present, all castes, classes, and sects make no scruple to cross the rivers in the same ferry boat without reference to the caste, status, or religion of their fellow passengers.

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ment. Take an every day case of a Lieut. Colonel or a medical officer, arriving from England, when his regiment is some 800 miles up the country; for every month which he occupies in marching or proceeding by water, to join his regiment, he loses,

A Lieut. Colonel, per mensem	Rs. 430 or £43.
Regimental Surgeon,	Rs. 300 or £30.

A daily loss of one pound eight shillings and eightpence, and one pound respectively.

So that they could afford to pay a very high fare, and yet be gainers; and escape exposure to the climate and fatigue.

The very opposite principles apply to the other classes. After having made every arrangement for the safety and comfort of all, we should hold out by the moderation of the fares, every inducement to the natives, to abandon their unsafe and tedious conveyances, for one, offering them every facility, combined with economy; making a sufficiently wide difference, to define the distinction between the native nobleman or rich merchant, and the petty trader, the fares of these classes, particularly, the last named, should be made as low as it is practicable;* bearing in mind that profits accrue in an

* Note to 3rd. Edition. "It is further believed that railway passengers will be found as numerous, in proportion to

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exact ratio to the masses conveyed, whether the masses be passengers, live stock, minerals or merchandize, e. g. a line with a traffic 750,000 tons per annum, (that of Liverpool and Manchester) could carry goods with as much profit at a penny per ton per mile, as a line (the Paris and Orleans) with a traffic of 150,000 tons at three pence per ton per mile.

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the population, in India as anywhere else, if only suitable fares and regulations be adopted." *(Report of Great Indian Peninsula Railway page 49).*

NOTE

TO THIRD EDITION.

FROM recent demonstrations in India there is no longer any reason to doubt but that the native community look forward to the introduction of railroads with a deepening interest; the declared sentiments of the most influential and intelligent members of that community assure us that they will readily co-operate in the establishment of this, to them, novel mode of transit. In former portions of this work we have seen the enlarged and business like views of the native merchants, and 18 months since at a great meeting of the Brahmins, held at Calcutta, it was decreed, that when going on pilgrimage, it would be as meritorious to travel by railroad as in any other way.

For information regarding the present modes of travelling in India see Appendix E.

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NOTE

TO THIRD EDITION.

SINCE the former editions of this little work were published, circumstances have occurred which render it quite unnecessary that its pages should be encumbered any longer with descriptions of projects only calculated to benefit their projectors; and most of those having more solid claims to attention, have had their merits recently so widely disseminated by means of luminous reports and speeches, that detailed descriptions of many projects would be altogether superfluous.

The two leading Companies, the East Indian and the Great Western of Bengal, having amalgamated on equitable terms, the latter merging in the former, and a Concession being granted by the authorities to the Consolidated Company, the remarks in the following important sections regarding the introduction of the Railroad system into the Bengal Presidency have reference now, solely to the East Indian Railway Company. They are the views originally enunciated in the first edition of this little work and to which the writer feels disposed to adhere.* All new original matter, as well as corroborative testimony from the Report of the Railway Commission and other documents, is added in the form of notes.

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* Note to 2nd. Edition. The first edition of this little work, had passed through the press, before the publication of the report of the Railway commission, and prior to its perusal by the writer; and there does not appear to be, after attentive consideration of that official document, any reason for withdrawing or modifying, any opinion expressed or conclusion arrived at, in those portions of the text, which described the merits or demerits of particular projects or which had reference to the proper mode of introducing railroads into India, with the view ultimately of establishing an efficient and comprehensive system. The report does not apply to the other sections of this pamphlet.

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SUGGESTIONS
AS TO THE MODE OF INTRODUCING
THE RAILWAY SYSTEM INTO INDIA.

It has been stated, we think without due consideration that "it cannot signify to the government, (who must derive considerable benefit from the measure under any circumstances) which line may be first completed." From this opinion we entirely dissent, as it is obviously the interest of the Government, as well as that of the people, and the Shareholders, that the first line opened, should be the one of all others, possessing the highest political and commercial advantages combined with the greatest facilities for construction, the most moderate expenditure, and the best adapted for being an integral portion of a great whole. Railway experience and expenditure at home, will point out the propriety of having, before a single sod is turned, general outline of the system which is hereafter pervade India, laid out and defined, and thus gu against the disappointment and confusion w would necessarily ensue, from the injudiciou

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MAP
of
INDIA

SHEWING THE DIRECTION OF THE

PROPOSED RAILWAYS,

Engraved for

IIIT EDITION OF "INDIAN RAILWAYS"

AND RECOMMENDED THEREIN

IN WHOLE OR IN PART.

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lection of an isolated scheme, having reference only to a particular locality.

But even when the general outline of this system has been, after mature deliberation, decided upon, we repeat, that it is the interest of all parties, that the first line or section opened, should be the one, of all others, possessing the most important advantages, combined with the greatest facilities for construction, and the most moderate expenditure, for it is obvious, that according to the success or otherwise of the first line, so will the general introduction of railway intercommunication into a new country, be accellerated or retarded. "But besides as a railway is so superior to all other means of communication, that it must necessarily supersede them, and confers the greatest advantages on the localities through which it passes, it becomes of greater consequence that the lines of railway should be wisely selected, and that railway companies should not be suffered, by any injudicious choice, to inflict injury, either on the public in general, or on the owners of property. That these subjects were not at first sufficiently attended to in this country, can hardly be a matter of surprise, when we reflect on the ignorance with respect to the nature of the change about to be effected by the new power thus brought into action, which then generally prevailed."*

* Railway acts. Second report.

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Confident, from the successful result of the first experiment, the government would have no difficulty in extending its patronage and support to new undertakings, and capitalists would eagerly contend for the prize of gain in the vast and magnificent fields of the East. Instead of losing their money in foreign loans, or enriching with railroads, Holland, Belgium, or France, by their superfluous wealth transmitted to India, under the guarantee of their native government, they would at once enrich themselves, ameliorate the condition of their distant fellow subjects, and indirectly, but surely, add to the dignity and wealth of their own country; giving to the mechanic and labourer of India, such employment as would speedily open up new markets and outlets for the products of the industrial energies of our home artizan, and add incalculably to the security and strength of our Eastern dominions. Thus the two countries would act and re-act upon each other to their mutual benefit.

Much depends upon the character of the line first completed, for the result will be effected by what it goes *through*, and not by what it goes *to*.* M.

* Note to 2nd. Edition. Mr. Peto states in evidence before Mr. Morrison's committee that the experience of Belgium furnishes a striking corroboration of the soundness of these views, "as it has been proved by the report of M. Desart, in whose hands the Belgium government placed the whole of its railway statistics, that in a given population, the traffic of the small towns and

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Desart, Inspector of Belgian State railways, has reduced the rates of traffic to a system, and proves that the large return expected, from connecting by a railway two great commercial cities, is not realized if they are beyond a certain distance ; but is absolutely certain to be drawn from a line binding together a succession of minor towns and villages, and we have no doubt but that this mode of calculation will be found of universal application.*

Unacquainted with India himself, the English capitalist looks to those placed in authority and acquainted with the country, to act with a just and discriminating vigilance in making the first move in the right direction, and those in authority will not disappoint this reasonable expectation.

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villages along a line is proportionally greater than the traffic between two large cities at the termini."—*Railway Acts. Second Report.*

* "The statement worked out from the government traffic returns, established beyond all doubt the following principle, viz :—That the number of passengers between two towns connected by a railway does not depend only on the population or commercial importance of these towns, but most materially on the distance between them. Thus the number of passengers will be greater on a line connecting a succession of small towns and villages, situated as they generally are in England and Belgium, than on a line of equal length connecting two large towns." *Extract from the half yearly Report of the Directors of the West Flanders' Railways July 3rd.* 1846. For further information see the work of M. Desart, the government engineer, and divisional inspector, recently printed.

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BENGAL PROPER,

OR

LOWER INDIA.

THE grand object, both for the government and the merchant to attain is, to connect Calcutta with the N. W. Frontier, and there can be no great difference of opinion as to the direction of the line from Mirzapore through the Doab to the banks of the Sutlej, this at once disposes of nearly two thirds of the entire length of the Grand Trunk Line; but as to the best mode of connecting Calcutta with Mirzapore, there are two, if not three, opinions enunciated, and it is to be borne in mind that this portion of the line, besides commencing at the metropolis of British India, traverses the provinces of Bengal and Behar, the revenues of which we have already shewn nearly equals those of the whole of the remaining British territories in India,* yielding a surplus of £4,000,000 annually, a portion of which flows from India to our shores, and the rest enables us to improve, consolidate

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* See page 50.

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and defend other and more remote regions in the East, naturally less productive.

The line from Calcutta on the Hooghly to Rajmahl* on the Ganges appears to possess every requisite claim to immediate selection by government†—the ground has been surveyed with great minuteness by their own officers, it follows the old and beaten track of commerce,‡ through a rich and densely

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* Rajmahal once the capital of Bengal is situated at the head of the Delta, "on the rock-bound and unchangeable bank of the Ganges" and has a population of upwards of 30,000. In the vicinity there are large and rich deposits of coal and iron: the amphitheatre of hills in the rear of the town is covered with a variety of excellent timber: stones fit for building purposes are also abundant in this locality.

The facilities thus afforded as far as materials are concerned, for the formation and working of a railway, from having the four important elements essential to its construction and efficiency, at one of the termini, need not be dwelt upon. It may, however, be pointed out that from its position and resources, especially when connected with Calcutta by a Railway, Rajmahl will naturally become the great station for the numerous fleets of steamers engaged in the inland trade.

Below Rajmahl the Bhaugirruttee and Jellinghi rivers (the present uncertain and tedious channels of communication between the Ganges and Calcutta) run from the Great Ganges and uniting their streams at Nuddeya constitute the Hooghly which flows past Calcutta to the bay of Bengal.

† Note to 3rd. Edition *i. e.* Were the amount guaranteed sufficient to *complete* the Ralmahl line and open an adequate section in Upper India at the same time.—The authorities being desirous of having a section made in the Lower and Upper Provinces simultaneously. A section in the former beginning at Calcutta would be comparatively useless until it debouched on the Ganges.

‡ Note to 2nd. Edition. It has been observed in every age,

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peopled country, and completely outflanks the Rajmahl and Bhaugulpore hills, its upper terminus at the lowest practicable point on the river, and below which the navigation is at all seasons either difficult or dangerous, and for nine months in the year most vexatiously circuitous; the advantages of this line are fully admitted in the report, and were minutely detailed on a former occasion.§ But in treating the subject generally as in this section, it is important to recollect that when comparing the merits of different projects, that a railroad having Calcutta for one terminus and some point on the Ganges for the other, the traffic will be in an inverse ratio to the length of the line, that is, the further a line is carried up, before it debouches upon that great commercial artery, the less would be the traffic.

By means of the Rajmahl line acting in concert with the several prosperous and influential steam navigation companies established on the Ganges,

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that when any branch of commerce has got into a certain channel, although it may be neither the most proper nor the most commodious one, it requires long time, and considerable efforts, to give it a different direction." *Historical disquisition regarding ancient India, by G. W. Robertson, D. D. F. R. S.*

"It will be found that all the successful railways in England are on those lines where communication existed before." *Report on the application of railway communication in India, by Captain Western, published in* 1843. This able officer is now a member of the railway commission in India.

§ Note to 3rd. Edition. The section above alluded to is omitted in this Edition.

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Calcutta will have quick and easy access to the North Western Provinces, through the heart of the indigo, opium, sugar, rice, cotton and silk districts, with a saving (for nine months in the year, when the smaller rivers between the Hooghly and Ganges are closed) of upwards of 300 miles of distance, by avoiding the tedious and perilous labyrinth of the Sunderbundes.

The report of the celebrated Rajmahl canal by General Macleod, late chief engineer, and Colonel W. N. Forbes has the following paragraphs.

"Bearing in mind that the Ganges receives in its course through 1200 miles of the central and infinitely improvable plains it fertilizes, eleven rivers, several of them equal to the Rhine, few less than the Thames, and that when it has reached the head of the Delta at Rajmahl, its *distance from Calcutta* does not exceed 200 *miles*, and further having in remembrance, that during a great portion of the year, the only passable channel for boats drawing five feet water, between the latter *city* (the capital of India) and the station named, makes a circuit of 528 miles, this chiefly through the perilous labyrinth of creeks, and wood-encumbered straits, forming the wilderness called the Sunderbundes, it will readily be acknowledged, that amongst the good effects of opening a direct line of permanent navigation between deep water in the

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Hooghly above Calcutta, and the great river at Rajmahl, there would be the highly important one of its affording the means of conveying safely, cheaply, and speedily, to the Ocean outlet, *increased* quantities, and ultimately improved qualities of the agricultural and mineral produce of the entire regions traversed; nor this alone, as by inevitable commercial reciprocation, the same line would immediately serve for supplying those regions with augmented amounts of the sea-borne products, or manufactures of other countries."

The report goes on to state that by means of a canal, during that portion of the year when the rivers are full, "most of the time lost in contending with the then rapid and ever tortuous Bhaugirruttee would be avoided, as also the risk, in the latter, annually leading to numerous wrecks and total losses of large amounts of property." Regarding the traffic, after having adverted to circumstances in their former reports, the Canal Committee make the following observations in paragraph 47 :—"And amongst them the fact that at one time, when *two* of the *Nuddeah Rivers* were only passable for dinghees, (or the smallest description of country boats) and that whilst at the same period * the third was only navigable for the minor class of cargo boats the annual collections

* The dry season.

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in the form of toll at the rate of one rupee per one hundred maunds, on the total tonnage passing through these channels, amounted to one hundred and fifty thousand rupees, assuredly prove that if the comparatively safe and direct line by the canal were once opened and fairly established, the total amount of tonnage daily passing through it would not fall short of 3,000 tons; which (at twenty-seven maunds to a ton) would make the *total number* of boats passed in a day (each averaging six hundred maunds burden) one hundred and thirty-five; and if (as proposed in our former reports) the toll levied was at the rate of two rupees per one hundred maunds, it will be seen that the annual income derivable from the work would be upwards of five hundred and eighty thousand rupees."*

"The *localities* in which, within accessible distances, stone or minerals adapted for building, are to be met with, have been pointed out in our previous reports, as *have* also *those* of beds of iron ore, and of coal, (the latter since experimentally brought in use) which the canal would either intersect or closely approach."†

* Note to Second Edition. Or 14½ per centum on the expended capital. With reference to a railway from Calcutta to Rajmahl, the traffic has been taken by an eminent Calcutta merchant and the managing director of an inland steam navigation company, and estimated to give, after all deductions, a net return of 12½ per cent per annum.—O. I. P.

† *Report on the Rajmahl Canal, by General Macleod and*

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The line from Calcutta to Rajmahl, besides being unexceptionable, *per se*, is a line that must be made, if railroads are to be made in India, either as the principal trunk, or as the most important branch that any trunk can possess ; " If such a rail be established, the steamers, instead of starting from Calcutta, will start from its Northern terminus, which will thus become in fact the steam-port of Calcutta. The narrow and often angular streams in the Sunderbundes, and lower Bengal will thus be avoided, the necessity of a double vessel will cease, single vessels of larger dimensions and engines of greater power may then be employed, by which a large saving of time and money will be effected.

" The advantages of such a line in every point of view are sufficient to recommend it to public favour."*

Colonel Forbes. Plans occupying fifty large sheets of drawing paper, exclusive of one hundred and fifty square feet containing the topograbical survey, accompanied this report, and are now deposited in the India House.

* Note to 2nd. Edition. Friend of India, 19th of February 1846. The Friend alludes to the Bogwangolah line, which, on account of its terminus, being a shifting village, (as stated in the first edition of this pamphlet) has been reported against, the preference being given by the commissioners to Rajmahl, some miles higher up the river, because it was stationary, and this being settled by authority, no doubt the Friend will give his voice also in favour of a fixed port, instead of a migratory one. Some of the companies have, for their passengers and goods, a flat in tow of the steamer, this explains what the Friend means by a double vessel. In his paper of the 14th of May last, the Friend informs us, that a splendid new steamer, the " Patna," will make the voyage by the Sunderbundes from

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" The passage of cargo boats takes between twenty and thirty days from Rajmahl to Calcutta. The losses are great, and the insurance as high as from England.*

NOTE TO THIRD EDITION.

THE report of the railway Commissioners on this line is as follows:—

" Para, 19.—A permanent point, however, on the banks of the Ganges, exists at or near Rajmahl, which might be suitable to receive the great traffic of the River, and be connected with the Trunk line a little northward of Burdwan, and be found advantageous to the general trade of the country, in like manner as the proposed canal of Lieut. Colonel Forbes would certainly have done if that important work had been carried into execution. Such a branch railway would in no point be removed very far to the westward of the projected line of the canal in question,"

Calcutta to Allahabad in ten days, provided she does not stick in the Sunderbundes, which would be at the rate of a little more than a hundred and eighteen miles daily; the whole distance being 1,186. The distance from Rajmahl to Allahabad being only five hundred miles, the same steamer travelling at the same rate, would reach the latter station in four days and a quarter. The two land journeys being six hundred miles, would at a very moderate rate of railway speed, be performed in twenty-four hours—thus allowing nine hours at each terminus, viz: Rajmahl and Allahabad for the removal of passengers' luggage and goods, which is surely more than sufficient for every purpose, the entire distance from Calcutta to Delhi may be accomplished, according to " the Friend " in six or seven days.—O. I. P.

* Calcutta Review for March 1846.

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" 36.—The first branch should be from a point near Burdwan to Rajmahl, along the district of country selected many years ago by Lieut. Colonel Forbes, for the Rajmahl canal: such a Railway will, in future, supersede the necessity for the canal, which, however, would have conferred great benefit on the trade of the country, if carried into execution when he first proposed it; the fact that such a canal had been for many years a desideratum, proves the same thing in favour of the more modern mode of intercommunication.

" 37. Besides the accommodation of the trade of the Ganges, it will give accommodation to Purneah, Malda, Dinagepore, Rungpore, and the country in that direction through which it may possibly hereafter be found desirable to extend this refined mode of transit.

" 38. After all that has been stated from time to time in favour of Lieut. Col. Forbes's important work, nothing more need be added in favour of a branch railway in that direction."

It is worthy of remark that although the Rajmahl line is treated in the report as a mere branch, yet its intrinsic merits are so great that the possibility is hinted at of this line becoming the great stem from which branches will proceed to supply some of the richest districts in India.

Captain Western of the Bengal Engineers, and a member of the Railway commission, in his " *Report on the application of Railway communication in India,*" published in the Calcutta papers, in speaking of the Rajmahl line, says, " That this line of country affords every facility, for forming a railway, will, I think, be allowed by every one acquainted with it. It is only necessary to state that from Calcutta to Rajmahl, a distance of two hundred miles, it passes through the Delta of the Ganges, and that in the survey undertaken under the superintendence of General Macleod and Major Forbes, with a view to construct a canal from Rajmahl to the Hooghly river, it was ascertained that the fall in the distance of one hundred and twenty-eight miles proposed for the

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canal was only fifty feet, as will be seen in the report by those officers of the 15th of February 1841; and as there are no difficulties in the way of high lands for the canal to contend with, none need be anticipated for a line of railroad."

"The earthwork in the line proposed would be very little, and I think I may safely say that the earthwork and ballasting for the rails will be much the same as the construction of the grand Trunk road in India; which consists of an earthen road, 30 feet wide, on an average 3 feet high, with a portion 16 feet wide metalled, the metalling being 1 foot deep. The cost of the Trunk road, including the small bridges, but exclusive of the bridges over the large rivers and Engineer officers' salaries, is under £250. a mile." He further states as his opinion, that the total cost of the construction of the railway would be about £4,400. per mile. This estimate is obviously too low, see page 70.

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N. W. PROVINCES,

OR

UPPER INDIA.

We have visited most of the countries in Europe, and in Holland, witnessed with much interest the mode of constructing railways in that kingdom, which from the nature of its soil and surface resembles in some respects, the alluvial plains of India. We have also travelled much in the latter country, and have proceeded by slow marches from Calcutta (through the Doab and the Cis-Sutlej States) to the Hymalayahs, and have seen no large portion of territory present the like facilities for the introduction of a railway, as from Allahabad to Delhi.* There is no natural difficulty of any description, no river to cross of any magnitude, as the line would traverse the Doab having the two great rivers one on either side, the country presenting as nearly as possible a level surface, its general inclination in any portion cannot be more than 3 or 4 feet per mile,

* The distance between these two Cities is 400 miles.

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and yet it is comparatively free from inundation, and the soil is in consequence more solid than in the lower provinces.* This line would have no rival, for the Ganges above Allahabad, from its ledges shallows, is closed to steamers, and, excepting for a few months in the year, the navigation even for country craft is very precarious, and the Jumna, from the sharp and angular rocks which rise from its bed, is still more dangerous and difficult. The quantity of water used for irrigating the increasing extent of cultivated land on the banks of the Jumna is annually diminishing the volume of its waters and its capacity for navigation.†

The river steamers, and ordinary craft, instead of competing with the railroad would form a powerful

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* The towns of Lahore and Umritser are, according to Burnes and Gerrard, 900 feet above the level of the sea, and 1,000 miles distant from it, the average slope of the country along the banks of the Indus may be estimated at less than 11 inches per mile, and on comparing this with the valley of the Ganges, we infer the general inclination of the country towards its mouth to be even still more gentle (after making due allowance for the smaller volume of water in the Ganges compared with that of the Jumna) from the sluggish nature of the stream, and the tidal influence extending above Calcutta, while in the Indus it ceases below Tatta, 25 miles nearer the sea than the former.

† Note to 3rd. Edition. The great Ganges Canal from Hurdwar to Allahabad now in progress of construction, for the purpose of irrigation, will, as it promotes agriculture in the same ratio, withdraw the means of cheap transit by absorbing the waters of the rivers. As the products of the soil increase so will the means of cheap transit diminish.

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basis, and keep up a continuous commercial and general communication between the railway and Calcutta ; and our great military stations and magazines at Allahabad, Cawnpore, Agra and Delhi, would be all in close communication with each other, and by means of the steamers have a free and rapid access to Calcutta.

This line of all others for testing the railway system of communication as applicable to India, on an *extended* scale, is, in our humble opinion, incomparably the best, and should it solve the mighty problem, in the solution of which, the whole civilized world will soon take an enlarged and deepening interest, in a manner at once satisfactory to the government and the proprietors, as we are confident it must do, beyond their most sanguine hopes, it would then be in a position to advance to the Sutlej,* or to execute a retrograde movement towards Calcutta.

While the railway was thus ministering to the public service, by concentrating the largest and most important military and civil stations, and the most populous and magnificent of the native cities,

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* Note to 3rd. Edition. "Where a terminus might be established on the highest navigable part of the Sutlej, and thus connect the great rivers, the Indus and Ganges." *Para.* 52. *Report of the Railway Commissioners.*

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in Upper India, there would be ample time allowed it, to develop and mature its plans; and having appropriated to itself the through and local traffic of that portion of the country, it would thus have a commerce and basis of its own, which would at once nourish and support the extension of the Grand Trunk Line, or enable it to throw out tributary feeders, in fact, empower it to advance in any direction, the exigencies of the state, or the claims of commerce might seem to demand.

NOTE

TO THIRD EDITION.

Since the publication of these views in the first edition of "Indian Railways," the writer has had the satisfaction to peruse the following corroborative testimony:—

"We beg to suggest that there is a line in the North West Provinces, which would answer admirably as an experimental line, viz., from Allahabad to Cawnpore."*

"From Allahabad to Agra and Delhi, the country presents probably fewer engineering difficulties than are found in almost any other district of equal extent. The inclination of the country rises gradually from Allahabad, varying from twelve to thirty six inches in the mile, with scarcely any perceptible variation."†

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* Report of Railway Commission presided over by Mr. Simms.

† Report of R. M. Stephenson Esq. C. E. Managing Director East Indian Railway Company.

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"I have marched throughout the Doab of the Ganges and Jumna in every possible direction, and from personal experience and observation, I can safely declare, that no tract of country on the face of the Globe, of similar extent, presents so few obstacles to Railway Engineers as the route from Allahabad to Delhee; it is as level as Wimbledon Common, without a single river to cross, and only two insignificant nullahs, the Kallee Nuddee and Eesan, the former has already an Iron Bridge over it; the cost will therefore be less than any other Railway in existence, with a dense population throughout the greater part of the distance, and flanked on one side by the fertile province of Rohilcund; the expense also of keeping it in repair will be trifling, as the periodical rains are not to be compared in violence with the Lower Provinces."*

We have already stated our decided preference for that plan of *commencing* improved transit, which would only supersede the river navigation where it was most defective, and co-operate with it where it was always available i. e. a railroad from Calcutta to deep water in the Ganges at Rajmahal,—from this point river steamers to Allahabad at the confluence of the Jumna and the Ganges, where deep water ceases—a railroad from Allahabad to Delhi and the Sutlej. This would itself be nearly one thousand miles of railroad, exclusive of branches, traversing the easiest, the richest, and most densely

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* Extract from letter of Major C. A. Munro, late Bengal Army, in Appendix to Report of Managing Director East Indian Railway Company.

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peopled portions of our dominions where the river transit is either dangerous or tedious, as by the Nuddeah rivers and sunderbundes, or only applicable to the smaller country-craft, and closed entirely to steamers, as the great rivers are beyond Allahabad. Above this point it is impossible, by land or by water, to move military stores or merchandise, in any quantity, beyond the average rate of twelve miles per diem.* No Utopian ideas of a railroad system starting at once into a complete perfectibility should divert enterprise and capital from so fair and inviting a field.

By adopting the river from Rajmahl to Allahabad the average cost of construction would be reduced one half, as that portion between Burdwan and Allahabad, which comprises all the difficulties, would not be included in the general estimate for a com-

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* Note to third Edition. At a charge of from four-pence to eight-pence per ton per mile by land carriage, and at one-penny to two pence per ton per mile by water, but the latter is limited, and precarious for the reasons assigned in the text. This is more than the minimum charge of an English Railroad. *See pages* 34 *and* 35.

" From enquiries of the numerous parties of Native Merchants travelling along the road with loaded camels, bullocks, and hackeries, it appeared that their speed, never exceeding two and a half miles an hour, had been reduced to less than one mile per hour, from the state of the roads, and that their cotton and other merchandise, were constantly damaged in crossing the rivers. They travel during about ten hours each day."

Report of Managing Director East Indian Railway Co.

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plete communication between Calcutta and the Sutlej. On the whole, then, it is our conviction that the line from Calcutta to Rajmahl, and that from Allahabad to Delhi, co-operating with fleets of river steamers, from Rajmahl to Allahabad, would at once be the most judicious, the easiest, the least costly, the soonest constructed, and in every other point of view the most advantageous mode of *introducing* the railway system into India.

After having supplied the regions indicated, the two lines might gradually approach each other as circumstances rendered it desirable or necessary.

The subjoined extract from a letter of General Macleod, late Chief Engineer, Bengal, published in the "Friend of India" of March 19th, 1846, stamps our views with real and solid value.

"I think the line proposed from Calcutta to Rajmahl a vast improvement and a very rational scheme. The soil is excellent the whole way, and the surveys of that part of the Country already so minutely taken as regards levels, and everything else required, that they may commence making their plans at once.

"I should certainly take a great interest in the line, as I do think it is the most eligible that could be thought of, and one that would form a most important benefit to the country. The next best line in my opinion will be that from Allahabad to Delhi.

"I do not know that I can afford the Directors

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any great extent of information, but I shall be glad to give them all I possess."

This eminent and experienced engineer officer, is now chairman of the Great Western of Bengal railway company, whose project is to connect Calcutta with Rajmahl.*

NOTE

TO THIRD EDITION.

In the concession granted to the East Indian Railway Co. the authorities stipulate for two Sections of the Trunk Line being made simultaneously, one in Upper, and the other in Lower India; and that there are two Sections so situated, both extremely favorable for experimental lines, we have good authority for asserting.†

The Report of the Railway Commission has the following paragraph: "We beg to suggest that there is a line in the North West Provinces which would answer admirably as an experimental line, viz. from Allahabad to Cawnpore; but if this line be thought too extensive

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* Note to third Edition. In consequence of the arrangement before alluded to General Macleod has joined the Consolidated Board of the East Indian Railway Company.

† "We highly approve of the proposition for commencing operation by the construction of Lines from Calcutta in the direction of Burdwan, and from Allahabad to Cawnpoor. The execution of these Divisions, which *will be within the limits of the first portion of your proposed expenditure,* involve comparatively few works difficult of construction, even in a country like India, whilst they will serve to educate the Employées of the Company, and afford good experience as to the action of a tropical climate on the Railway works, so necessary for guidance before the completion of the heavier portions of the Line.—*Report of Messrs. Rendel and Beurdmore. Consulting Engineers to the East Indian Railway Company.*

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as an experimental one, we believe that a line from Calcutta to Barrackpore would find no lack of British Capitalists, both able and willing to undertake its immediate construction." The latter section from Calcutta to Barrackpore (the Head Quarters of the Presidency Division of the army) would have no impediment of any description to contend with, so far as its construction is concerned, and the metropolis of British India, under the immediate supervision of the supreme government, might be deemed the most appropriate place to break ground when about introducing so great and serious an innovation; this is plausible, but nothing more. The distance between the two places is 16 miles, with an admirable communication both by land and water, the Barrackpore road is notoriously the best in India; no important object could be gained by a section from Calcutta unless it were carried far enough to debouche on the Main Ganges, and as the sum guarranteed (3,000,000*l*) is inadequate to do this and open a sufficiently large section in Upper India, providing at the same time the requisite plant for both sections, the attention of all parties ought, we think, to be directed to the attainment of one object *e. g.* that the railway company should either *complete* the line or branch from Calcutta to Rajmahl without a section in Upper India, or confine its attention *exclusively* to a section in the latter until a fresh sum be guaranteed. The importance of connecting Calcutta with permanently deep water in the Ganges, at a point admirably adapted for a steam port for the inland navigation, cannot, in any point of view, be over estimated, as it would form the only link wanting in the chain of communication between the two great channels of commerce, the Main Ganges, and Hooghly.* That 3,000.000*l* would more

* Note to 3rd. Edition.

As formerly explained, passengers and goods by the steamers, and large country craft would for nine months in the year be saved a dangerous voyage of 520 miles, the distance by the railroad being only 190 miles. This would lead

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than suffice for this line, from the reports, plans and sections before us there is good ground for believing. Should the amount however be deemed insufficient, or the *completion* of this line inexpedient as an experiment, then let there be no lower section for the present, *for nothing could be attained either for Government or Commerce until the Railway debouches on the Ganges*, and exclusive attention should be directed to Upper India; a portion of the section from Allahabad to Delhi, for instance, from Allahabad to Cawnpore 144 miles in length, possessing every claim to selection. The Doab is the best portion of country perhaps in the globe for a railway. The navigation of the Jumna and the Ganges above Allahabad, at all times precarious, is gradually getting worse from the increasing cultivation demanding a larger supply of water for irrigation, and the completion of the Doab canal, as formerly mentioned, will greatly aggravate existing difficulties by withdrawing a still larger portion of water for cultivation. The land carriage is, as everywhere else, expensive and slow; the commerce is great, and the population dense, robust, and given to travel.

The completion of a large section of the Grand Trunk in the Doab would be of evident importance to the Government from connecting together many great depôts and military stations, and advancing them all towards the N. W. Frontier. Three fourths of the Bengal army are cantooned above Allahabad, and almost all emergent movements, take place above this point; and the cotton growing districts on the banks of the Nerbudda (as recently stated by the Chairman of

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to corresponding improvement in the river transit, the necessity for a double vessel would cease; *i. e.* the machinery of the steamer in one vessel, and the passengers and goods in another. At present if the merchant object to the above delay, the only alternative he has is to subdivide his goods into small quantities, and commit them to the fragile dinghees (the smallest country boats) which navigate for nine months in the years the Nuddea rivers.

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the East India Company at a Court of Proprietors) are more in want of roads than any region of our Empire in the East, a whole year being consumed in the transit of their cotton to the coast the transmission of which would at once be cheapened and facilitated to such a degree as would impart an energy hitherto unknown to the commerce of India, and would speedily pour increased quantities of improved quality of this staple into our seats of commerce and manufacture in England, at such rates, as would secure to India this important branch of trade, and ameliorate the condition incalculably of our home artizan.

By selecting exclusively, either Upper or Lower India for the scene of the first experiment, there would be concentration of effort to produce one great and continuous result, instead of energy and skill being divided between two distinct and distant sections, the lower one in itself, unless carried to the Ganges, comparatively useless, and absorbing a large portion of the profit certain to be drawn from the upper. In Upper India, the Railway would have to compete with slow, but comparatively safe land carriage, at rates varying from 4d to 8d per ton, and in Lower India, with river transit, which however objectionable we have seen it to be, is only, 1d to 2d per ton, per mile.

In fine, the Railway Company should have the option, either to complete the line or branch to Rajmahl, without a section in Upper India, or only to make a section of the Trunk Line in Upper India *e. g.* from Allahabad to Cawnpore.

The merit of the two modes (the Direct and Gangetic valley lines) of filling up the interval between the Rajmahl and Allahabad lines, were detailed in the 2nd. edition of his brochure, but the smallness of the sum guaranteed, renders this essentially a secondary, instead of a primary proposition.

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MADRAS.

THE Railway from Madras to Wallajanuggur and Arcot,* more modest in its ambition than the one which we have just now so freely animadverted upon,† only

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* Length of line 70 miles.
Capital (shares £20 each.) £500,000.

The other companies have £50 shares. This latter division of capital, appears to require revision.

Note to 3rd. Edition. The only company that has obtained, or is likely to obtain a Concession at present viz: the East Indian Railway Company is to reduce its capital to the amount on which 5 per cent per annum for 25 years is guaranteed i. e. to £3,000,000, and the shares from £50 to £20. The Directors have pledged themselves to the former, and an Act of Parliament is to secure the latter.

† Note to 3rd. Edition. "THE MADRAS AND BOMBAY DIRECT RAILWAY."—Annihilating the intervening space, it would bring into close approximation those widely separated and important localities. A crude and singularly ill-timed abortion! The promoters of this fiction are no doubt honorable men, but are only remarkable for the entire want of any apparent connection with the vast and distant region they have selected for the scene of their labours.

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contemplates, for the present at least, a line of seventy miles in length, and which, after careful and accurate surveys, was approved several years ago, as of easy and cheap construction.

The Company for the prosecution of this most legitimate enterprize, is supported both in this country and in India, by the Civil and Military servants of the East India Company, as well as, by some of the leading members of the commercial portion of the community.

" This line has all the requisites for an experi-

They probably propose the railway, from benevolent feelings towards the government letter carriers, to save them their tedious and toilsome journeys. Traffic on this route, no one ever heard of, and for hundreds of miles, there is no made road, however indifferent, but we suppose that they, if they make the one, think that providence will send the other, and no doubt it would come in time.

In the Prospectus, allusion was made to the Sikh invasion, with much propriety, as showing the necessity for railways to meet, or repel danger from the north-west frontier, and the sequitur flows naturally, that for this purpose, Madras and Bombay should have railway communication, not towards the frontier, but with each other! Bombay being distant from the recent point of attack at Ferozepore, one thousand miles, and Madras about sixteen hundred miles! Bombay being seven hundred and sixty-three miles to the north-west of Madras.

This railway, should it be able to emerge from the Ghauts, would lose itself in almost interminable jungle, redolent of malaria, and replete with noisome reptiles—a land without inhabitant, and where it would only startle the tiger as he crouches in his lair!—we have no hesitation in saying, that the Madras and Bombay Direct, is a direct absurdity!

Note to third Edition. The sections dedicated to the *Glenmuchkins* have been omitted in this impression; the above is an extract from one of them.

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mental railroad; the distance is moderate, not exceeding seventy miles, and the country between the termini, may be taken, for all practical purposes, as a dead level; the rise in seventy miles, not exceeding six hundred feet; there is already a substantial raised road, for carts upon the line, which has successfully proved the capability of such a work, to withstand the peculiar sources of destructive action enumerated in the Court's minute, as operating against the railway system in India. The termini, are both places of great commercial importance; a large traffic in goods, passengers, troops, and military stores already exists upon the road, and it passes through a fertile and very populous country.

"The construction of a railroad on the Great Western line of communication, between Madras and Bangalore, attracted attention so long ago as the year 1832; in the year 1836 a line in this direction, as far as Wallajahnuggur, was surveyed by an eminent officer in the Madras engineers. The subject was subsequently taken up by a member of the Board of Revenue at Madras, and the construction of a line, for the sole purpose of the conveyance of salt from the sea coast, where it is manufactured, to Wallajahnuggur, where the greatest part of the produce of the country westward from Madras, is brought upon cattle, which take salt, as a return load into the interior of the country, was pressed upon

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the attention of the local government for its adoption. At a later period, more detailed surveys of this line have been made, and two of them very recently, by officers of engineers, who were fully acquainted with all the varieties of construction of railroads in this country, and in America.

" The surveys and estimates of these officers contain the minutest details of the cost of construction of a single line of rails, upon a principle which has been found to be perfectly efficient in America.

" But it is considered, that, however desirable such a construction may be, for the feeding lines that connect the thinly peopled, and less cultivated tracts of the country, with the main trunk lines, upon which the largest portion of the traffic must always pass, a more substantial method of construction, and one more approaching that found to answer best in Europe, will be required upon the trunk lines, of which that from Madras to Bangalore, is the most important within the Madras territories. The country from Madras to Arcot, however, is so singularly favourable for the construction of a railroad, that the cost of a single line, with rails of the dimensions generally used in this country, will not exceed £5,000 a mile; and by fixing the available capital at £500,000; it is considered, that a sufficient fund will be provided, to meet all the possible contingencies that can attend the construction of the proposed line.

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" The present population of the territories, included in the Presidency of Madras, exceeds 14,000,000. The population of Madras itself, the terminus of the Railway, now exceeds 600,000. The line which is now proposed, will pass close to the populous town of Conjeveram, at a distance of forty-five miles from Madras, and through a densely peopled and fertile country the whole way. The principal article of traffic, towards the interior will be salt, for their supplies of which the population inland is entirely dependant on the sea coast. From Wallajahnuggur the line will communicate with the great cotton and indigo district of Cuddapah Bellary, and the country towards Hyderbad on the North and West; it will afford facilities for the transport to the coast of the produce of Mysore and North Arcot, consisting of sugar, coffee, betel-nut, lac, potatoes, wheat, oil-seeds, grain of various kinds, charcoal and firewood. Towards the West and South it will facilitate communication with the cotton districts of Salem. and Coimbatore : and towards the South with the fertile countries of Trichinopoly and Tanjore. The best cotton that is raised in India, is produced in the Madras territories ; all that is required to enable it to compete successfully with American cotton is, increased facilities for bringing it to the shipping port of Madras,* in good condition, and at a moderate rate

* The projected pier of Madras will be a great boon to Commerce, and can only be duly estimated by those aquainted

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of transport, which only can be effected by railroad.* The natural capabilities of the Mysore country, for the production of the finest sugar and coffee, are unlimited ; and a cheap and commodious system of transport, is all that is required to develope its resources.

" At present there exists a traffic on this line, of goods alone, amounting to about 30,000 tons a year and 150,000 passengers in each direction, which would make a fair return upon the capital. It is impossible to calculate the returns to be expected for transport of troops, military stores, treasure, and the conveyance of the mails on account of government, but the amount must be considerable. The same consequences, must follow the introduction of railroads in India. that have followed elsewhere ; and already the results, in every instance, have far exceeded the expectations, which the most sanguine speculator would have ventured to form, before the opening of the Manchester and Liverpool railway. The system is now but in its infancy in Europe, and its progression hereafter, no one can calculate. The same results must follow, in every instance of the introduc-

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with the present expense, delay, difficulty, and danger, of landing and shipping goods, from the violence of the surf — O. I. P.

* The Madras rate for conveying goverment stores by carts, is five-pence-halfpenny per ton per mile. The Madras railway estimate, is two-pence per ton per mile.—O. I. P.

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tion of railways into countries possessing a fertile soil, a good climate, and a numerous and industrious population ; and at this moment, there is, probably, no portion of the globe, where the introduction of railways will ultimately produce more important results, than the British possessions in India.

" Should the success of the first line which it is contemplated to undertake, warrant the extension of the railroad system throughout the Madras territories, it is the intention of this company, to raise the additional capital that may be required, to proceed in the direction of Cuddapah, Bellary, and Hyderabad, North ; Mysore, Salem, and Trichinopoly, West and South; and to connect the remote provinces with the trunk lines, by branches of less expensive construction, throughout the Madras territories."*

We have no doubt of the ultimate result being favourable, and dismiss the project wishing it every success.

* *Papers relating to the Madras Railway Company, printed 20th August* 1846.

Note to 2nd. Edition. Some conception of the resources of this portion of the "Golden Peninsula," may be formed from the military means, which the single state of Mysore was able to accumulate, under the pressure of a long war. At the peace, the treasure of Tippoo, was calculated at eighty millions sterling ; he had six hundred thousand stand of arms, two thousand cannons, with a regular force of artillery, cavalry, and infantry, of one hundred thousand men ; besides hordes of irregular horse.

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There is no other scheme connected with Madras, that we are aware of, worthy of notice.

NOTE

TO THIRD EDITION.

Report upon the proposed Madras and Wallajahnuggur Railroad, from F. W. Simms Esq., Director of the Railway Department, to G. A. Bushby Esq., Secretary to the Government of India.

Dated 30th December, 1845.

Sir,

In obedience to the commands of the Supreme Government, contained in your letter of the 13th instant, I have the honor of submitting my opinion on the proposed line of railroad from Madras to Wallajahnuggur, founded upon an examination of the documents submitted for my perusal. Before I refer to the immediate subject of this report, I will take this opportunity of expressing my opinion (so far as nearly four months' residence and observation in this country have enabled me to judge) upon several important subjects named by the Honourable the Court of Directors, in the minutes of the 7th of May last.

1st. As to the periodical rains and inundations. I do not expect that, with a judiciously selected and well-constructed line, any serious injury to the works may be anticipated, and from this cause, nothing but what a small annual outlay will set to rights.

2nd. The continued action of violent winds, and influence of a vertical sun.

Suitable arrangements in the construction of the works will overcome any difficulty arising from these causes; as to the line itself, their effects will be more felt in working the trains, especially the wind, at high velocities; no fears need be entertained upon this subject as to the ultimate result.

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3rd. The ravages of insects and vermin upon timber and earthwork.

If the information I have received in India be correct, that the destructive action of insects upon the Teak and Ironwood of Arracan amounts to nothing, or next to nothing, that question is at once disposed of; but should further investigation show, that such is not the fact, recourse must be had either to the use of stone, or to the employment of one or more of the various preparations for timber now in use in England, which it is probable, may also be found desirable on the score of economy, to render the timber more durable; this, however, at present, is by no means certain. To the earthwork no mischief can arise from this cause, if the overseers and labourers on the line discharge their duties in a proper manner.

4th. The destructive effects of the spontaneous vegetation of underwood upon earth and brickwork. To obviate this evil, nothing more is required than a faithful discharge of the duties of the overseers and labourers, in rooting up every germ of such vegetation as, soon as it appears.

5th. The unenclosed and unprotected tracts of country.

A fence, similar to our quick fences in England, would answer through the open and cultivated parts of the country which may or may not be employed through the districts covered with jungle, as circumstances may require. Such fence, may be formed of the plant called the Beranda, or the Mysore thorn, or the prickly pear, all of which, and many others, if kept well trimmed, would make a suitable fence.

6. The difficulty and expense of securing the services of competent and trustworthy engineers. This difficulty I make no doubt, will be overcome by a suitable arrangement at an early period—such I think would be the sending of a few native or half-caste young men to England, to be trained until some engineers are ready to be sent to India, upon their return in charge of such engineers; and under the superintendence of one or two English engineers, there would be laid the foundation for the training of as many native engine drivers as might be required; such native youths while in England should not only be instructed to drive an engine, but to repair them when out of order.

Such are my present opinions upon the foregoing subjects; and if any changes shortly take place therein, I shall have an opportunity of stating them, when referring thereto in the report that myself and Captains Boileau and Western will

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have the honor to present to the Government of Bengal, upon the completion of our present examination of the country, as tc its capabilities for a line of railway from Calcutta to the North-west Provinces.

I have thought it necessary to discuss the natural difficulties that might be expected, to the introduction and working of railways in India in general, before entering upon the immediate subject of my report, namely, the proposed railway from Madras to Wallajahnuggur, which I will now consider under the following heads :—

1st. Its expediency.
2nd. Its practicability.
3rd. Its bearing upon a general system of railroads in India.
4th. The mode of construction and cost.
5th. The income and probable return.
6th. Terms of and period of concession.

1st. Its expediency. Little need be said on this point : for after the experience we have had in Europe, in the construction of common highways and railroads, and of the results of their working, there can be no doubt that a railroad, is the most desirable of all modes of communication known at the present time ; and whenever it appears, that a new highway is required for a numerous body of people, and of a considerable trade, a preference should be given to a railroad, although there may be only a reasonable ground to suppose that the existing traffic will pay but a small interest on the capital expended, in addition to the working expenses of the line, for experience shows, that in most cases, the additionalamount of traffic, created by the existence of so refined a mode of transit, realzies a remunerative return ; and from all that I have as yet seen of India, and learned of its circumstances and condition, I see no reason to doubt, that there will be a similarity in the result.

2nd. Its practicability. Of this, in the absence of a personal survey, I can only judge of the documents laid before me, and from them I conclude that there can be no doubt whatever upon the subject. The mode of its construction and its cost I will presently consider.

3rd. Its bearing upon a general system of railroads for India.

That is a subject of importance in a new country where this new mode of transit is to be introduced for the first time, and where it will be desirable that every line, however

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short, should have reference to a general system of railways, of which it will ultimately become a part; so far as I can judge from the papers before me, and an examination of a general map of India, it appears that but little (if any) objection can be made to the proposed Railway in this respect, provided, that the mode of its construction, &c., be consistent with what may ultimately be adopted for the whole of the lines.

4th. The mode of construction and cost. This should not be left to the opinion of any engineers who may chance to be employed by the Railway Company, as they are too frequently induced to adopt inexpensive expedients (wise or unwise) to overcome pecuniary and other difficulties, which for the *time* may answer the purposes of the promoters of the work: because I look upon the Railways of India, as one vast scheme of the highest importance to the future welfare of this great empire; and although at first they will be constructed and maintained by private companies, yet after a lapse of years, will fall into the hands of the Government and become public property, and on this account, as also for the best and most advantageous mode of working them, it is essential, that they should be of a permanent and uniform kind, and one general system be extended to all the lines.

If the above view of the case be acquiesced in by the Government, I would recommend that the works be constructed of a better character than is proposed in any of the plans set forth in the documents before me, and therefore the original expenditure would be greater than therein estimated; and when the proper time arrives, I shall be prepared with a general specification for the works, that should be binding on the part of all railway companies. or other contracting parties, to carry out to the satisfaction of Government, which specification should be subject to alteration only in its unimportant details, and then, not without the sanction of the representative of Government.

The capital of the Madras Railway Company, for constructing the line from Madras to Wallajahnuggur, is stated in their prospectus to be 500,000*l*: with this they propose, wisely as I think, to adopt a more substantial mode of construction than is suggested in the documents now before me, "and one more approaching that found to answer best in Europe." They propose to construct a single line of railway, about seventy miles in length. at a cost not exceeding 5,000 per mile, which low rate they state will be owing to the "singularly favourable country through which it passes."

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With the disadvantage of not having surveyed or seen the ground, and having no detailed plans or maps of the country around Madras, and of the line, or even a section of the line itself, I cannot be considered as in a position to state what the cost will really be; but judging of what I have seen of works in Bengal, and knowing the cost of rails, engines, and machinery, which I expect must be nearly all brought from England, I am of opinion that 5,000*l* per mile will be insufficient for the construction of the line and the purchase of the plant necessary for working it. It is, however, probable, that the *whole* of the proposed capital of half a million sterling, would cover the outlay, provided that the line does not exceed seventy miles in length, and the expense of management be very economical. An additional 100,000*l* (supposing that all the statements before me are correct), I expect would make the capital ample for the purposes proposed, and I would advise that it be increased to that amount.

I should not hesitate in this case to recommend the Government to allow of a single line of railway; yet their consent should be subject to the condition, that all bridges and other works of masonry should be constructed of such dimensions as to be suitable (without alteration or addition) for a double line, if such hereafter should be deemed necessary or expedient, and that the Railway Company should be bound to lay down such second line, whenever required so to do by the Government, and also in the construction of the single line, a sufficient length, or lengths of double line, forming passing places, be constructed, as well as a sufficient number of level crossings, to provide for the present and future wants of the country. They should likewise be bound to lay their rails with whatever guage may be decided upon by the Government, as the one for general adoption on the railways in India. This should be scrupulously adhered to, for although at present such a restriction may appear to be of small moment, upon such a line, and in such a situation as the one under discussion, yet who can say what amount of inconvenience, and what serious impediments, may ultimately result from a departure from a general system whenever lines from the north, the west, and the south, intersect therewith, and with each other.

5th. The income and probable return. Assuming the number of tons of goods carried annually along the line to be, as stated, 30,000 tons, and the number of passengers 150,000, the income derivable therefrom ought to be, in round numbers, at least for goods, £17,500, at twopence

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per ton per mile; and for passengers, £32,812, at three farthings per mile, making a total of £50,312, supposing them to travel the whole distance.

And I consider the annual expense of working the line, and maintaining both it and the plant in perfect repair, will not be less than £20,000; that is, putting it on the most limited scale, and the interest upon £600,000, supposing the capital to be augmented to that sum, would amount to £30,000, at five per cent. The income, therefore, in order to pay that rate of interest, should be £50,000 per annum, and we have seen above, that it will probably amount to £50,312: as the traffic is stated to exist at the present time, and which will in all probability be greatly increased, there can be nothing therefore unreasonable in expecting that the proprietors will realise five per cent. upon their outlay. In the above statement, I have considered that the plant and staff is to be of the most limited and economical kind, and also that the traffic will bear a charge of twopence per ton per mile on the goods,* and three-farthings per mile for passengers.

6th. Terms of and period of concession. The terms upon which the concession may be granted should have a reference to the line becoming part of a general system of railways intersecting India in all directions, and its ultimately becoming the property of the Government. With this object, not only should the line be constructed after a special manner, but the Company should be required to work the line according to a system to be laid down, in which one code of signals may be employed upon every railroad in India, whereby servants passing from one to another, may not be liable to mistakes in that important particular; and so far as possible a duplicate system be introduced in all the details of the railway, so that an accident happening on any line, to any engine or train from another line, or to any part thereof (even to the glass, slides, and burners of the lamps), may be replaced at the nearest station or storehouse, as all similar parts should, as much as possible, be constructed to the same moulds and the same patterns. Likewise, the Railway Company should be required to furnish from time to time, whatever returns, statistical or otherwise that the Government may require; and the whole working

* Note to 3rd. Edition. The Madras rate for conveying governing stores is five-pence per ton per mile. O.I.P.

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and book-keeping, to be subject to their control and supervision.

In settling the lease, it might be equitable, as there is so much uncertainty as to the returns, to allow the *period* or term to remain blank until the line shall have been opened throughout for a space of ten years, when the average earnings of the last three years might be assumed as a basis upon which to calculate the duration of the lease, that should yield a fixed per centage profit upon the capital, and provide for the redemption of the capital itself. At the expiration of the lease, the whole of the Railway and its appurtenances should become the property of the Government, without payment, except, perhaps, for the plant, which might be taken at a valuation.

As a guarantee for the security of the parties, it might probably be advisable to require at the outset a deposit of ten or fifteen per cent. upon the whole capital, to be returned, or applied for the continuance of the works, when one moiety of the capital shall have been expended thereon.

In conclusion, I must be permitted again to allude to the fact, that this report is founded entirely upon documentary evidence, and therefore must be considered as subject to the influence of any errors these documents may contain.

(Signed.) F. W. Simms. C. E.
Director of the Railway Department.

True Copy.
(Signed.) G. A. Bushby.
Secretary to the Government of India.

(A True Copy.)
J. F. Thomas.
Chief Secretary.

NOTE

TO THIRD EDITION.

The Madras Railway Company, so well organized and managed with so much ability and economy, came to the resolution in the month of June last of dissolving the Company, in consequence of the monetary pressure and the want of *encouragement* from the authorities.

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BOMBAY.

We now proceed to present to our readers' consideration the project of the Great Indian Peninsula Railway Company, the only railway which Western India boasts of. The presidency of Bombay occupies a most influential position, whether we view its political, and military bearings, or estimate its commercial relations, and it has only been for the sake of having some regard to the methodical arrangement of our subject, that we have postponed till this period, the mention of a railway which has for its primary object, the accommodating of Bombay and its subject provinces.

In the magnitude of its ulterior designs, it is second to none, and is supported both here, and at the Presidency, by gentlemen of wealth and consideration.

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However favourably we may be disposed to a great and interesting undertaking, we see it almost at the outset beset with obstacles of no common magnitude. We borrow from Mr. Chapman's* statement the following extracts :—

" Every body knows, that at a small distance inland from the western coast of the Peninsula of India, a range of rugged and precipitous mountains, improperly, but generally called the Ghauts, buttresses and defines the table land, of the Deccan ; between this range and the sea, is a strip of land, called the Concan, low and flat in the valleys, but much intersected, and encumbered with transverse offsets from the great range. The highest points of the Ghauts, rise to the elevation of above four-thousand feet, and the face of the range towards the sea, presents little but precipitous walls, or impracticable slopes. In a few places, however, the crest is cleft down to the level of the inland plain, that is, about two-thousand feet above the sea, and a transverse spur at the same place, jutting westward into the Concan, affords the means of ascending to it, though commonly not without considerable difficulty and labour."

" The ascent of the Ghauts is always spoken of as the great difficulty on this line, and the chief objec-

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* The Manager of the Company.

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tion to it. The description of the Malsejee Ghaut* just given from official papers, may properly serve to diminish the force of any fears on the subject; nevertheless, the climbing of these celebrated heights by mechanical means, will still remain a most interesting practical problem. If it can be accomplished by means already in use, and suitable to the circumstances of the case, it will be better to do so, than to incur the cost, risk and delay of new contrivances; if, however, such be not at our disposal, I do not speak by guess in saying, that the requisite devices will not be wanting."

From the top of the Ghaut to a considerable distance, the country is open and level, although as we proceed, the cultivated fields are displaced by jungle, and the villages are far apart, and in some instances deserted.

But the soil is naturally rich and admirably adapted to the cultivation of cotton, the great staple of this portion of India. The people are most industrious, and only want efficient roads to enable them to send their goods to market, to make the elevated region of the Deccan vie with the rich plains of Bengal in productive power. At present this portion of India, is alike discreditable to the British and the native rulers. From the feeble, and almost bankrupt

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* See Mr. Chapman's printed statement.

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government of the Nizam, only formidable to its defenceless peasantry, nothing can be expected, but that its provinces should gradually, from the grinding exactions of its officials, return to the deadly and primeval wilderness, and that its deserted villages should be tenanted by noxious reptiles and beasts of prey. But the wretched government of the Nizam, is fast drawing to a close, when the fields will be regenerated, and the voice of man heard again in the villages, under a rule at once strong and beneficent. This has ever been the case on a transfer from Native to British authority, with the exception of that portion of the Deccan already in our possession, and why we have held back our hand, from extending the usual blessings of our rule, and opening the resources of the country, by some attempt, however, imperfect, at improving the means of communication, is to be sought for, in the great difficulty of making roads in the Deccan, from the nature of the soil, men and horses sinking knee deep, in its black and slimy loam.

The Bombay government have frequently projected roads, but as the expenditure of this Presidency falls short of the revenue, the balance being defrayed from the surplus revenue of Bengal, the reason is obvious, why beyond protection to life and property, we have little at present to offer the refugees who cross our border. With

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moderately good roads or a railway, we should reclaim fertile fields from the jungle, clothe and feed a disheartened and most industrious people, reaping in return, a more prosperous revenue, and additional security to our possessions. Duty, true policy, beneficence, and the strongest plea of all we fear, self-interest, centre for once in one point, and urge upon us the necessity of improved intercourse in the west of India. The hardship which the poor people of the Deccan suffer, in bringing their cotton to market, is scarcely to be credited, and is graphically described by Mr. Williamson, late Revenue Commissioner, Bombay, in his second letter to Lord Wharncliffe. This letter, and another by the same gentleman, we strongly recommend to the attentive perusal of all interested in the welfare of India, confining ourselves to an extract or two.

"But there is *one* mode of promoting internal improvement which has been tried more or less in most provinces in India, and which I will venture to say has in no single instance been found to fail—I allude to the improvement of internal communication. As far as my experience in India goes, no road has ever been constructed without an immediate, and almost magical effect, on the prosperity of the town with which it communicates, and yet the extent of the new road annually opened in the whole of the Western

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Presidency of India, is not beyond what would be deemed requisite in a single county in England.

" The consequence is, that the cotton which might travel the whole distance to the sea-coast, on carts along the made road, at the rate of six bullock loads on a cart drawn by two bullocks, twelve miles per diem, now creeps the greater part of the distance, six loads on six separate pack bullocks, only eight miles per diem. As a proof on this new line, of the effect of improving roads, I may mention the instance of the Bhore Ghaut.

" When this pass was first made practicable to wheeled carriages about the year 1828, the toll realised between £400 and £500 a year. Twelve years ago a speculator was ruined by farming them from government for £1000. They now annually let at £3000 or £4000 per annum, so that the four years, besides providing for the expense of annual repairs, the toll now more than covers the original cost of constructing the road."

This line is proposed to be made cautiously according to the encouragement held out, and should it advance so far as Nagpore, 508 miles E.N.E. of Bombay (close to Kamptee, the most central military position in India,) it will proceed either to Calcutta, or what is more probable, join the great East India trunk line at Mirzapore, which is 890 miles E.N.E. of Bombay.

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This latter arrangement would give us our intelligence from Upper India and Bengal a week earlier than at present, and in conjunction with the trunk line from Calcutta to Delhi, would enable the combined armies of the two presidencies, to concentrate their powers on almost any point of our dominions that could, by possibility be threatened. This enterprize will, for the present, curb its ambition, till it has solved the difficult problem of climbing the Ghauts.* This would of itself be a great achievement, and of incalculable advantage to the presidency.†

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* The Americans have ascended the Alleghany mountains, height of 1398 feet, and at a very moderate cost, by means of fixed engines.

† Note to 2nd. Edition. A letter, under date June 1846, addressed by the Committee in Bombay to the Governor of that Presidency, has the following extract from the Engineers' Report of the actual ascent of the Malsej Ghât.

" The whole plane will be in length 31,000 feet, and its total descent 1.718 feet: giving an average gradient under one in nineteen, which average is obtained very nearly throughout, and never exceeded to a greater extent than one in fifteen. The plane has two curves, one 7,400, the other 16,900 feet from the summit; each is in length 800 feet, and of 5,000 feet radius. The plane, therefore, may be considered practically as straight. The earthworkss required, will be chiefly tunnelling and open gallery. It is difficult to draw the line exactly between the two, but in round numbers it may be stated, that there will be 10,400 feet of tunnelling in eight lengths, and 5,100 feet of gallery, passing rather close to, or within from ten to thirty feet of the face of the slopes. The excavations are in excess of the embankments, and are conveniently placed for their formation. The lead throughout

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The Directors of this project will, we have no doubt, watch over the interests of their shareholders, and secure to them, if a concession be obtained, such a guarantee, as shall preclude the possibility of loss; we do not think however, that it will be one of the first lines authorized to be made, for its success in a commercial point of view is certainly problematical, in comparison with the Great Western of Bengal, or any portion of the great trunk line between Allahabad and the Sutlej. We, however, heartily recommend the Great Indian Peninsula, to the protection of a wise and paternal goverment.

Having passed in review before us, the various schemes for railway communication in India, and having given our opinion, founded as we conscientiously believe, on sound data, or upon what we have seen, or known ourselves—we feel, that we have discharged the grave and onerous duty which we proposed, and we now resume for a few moments our general remarks.

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will be trifling. The material to be excavated, is either rock or moorum; the former is much fissured; the latter soft and easily worked. Both, however, there is reason to believe, to be sufficiently firm to stand in the tunnels without artificial support. The masonry will be light, and composed almost wholly of culverts. The quantity of water that will flow under the line, during each rainy season is considerable; but owing to the scarred and broken character of the ground, the water courses are very numerous, and the force and volume of any one stream not considerable."

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NOTE

TO THIRD EDITION.

We have for some time (says a Bombay paper) been in possession of a series of "Papers illustrative of the prospects of the Great Indian Peninsula Railway Company, printed for the use of the Company,"—of which it is was our intention to have attempted an abridgment or an analysis. The documents embody a very large mass of most important matter,—carefully got up, and perspicuously put together; yet on minute perusal of the whole, we find ourselves unable to give any better account of their contents, than that furnished by the letter of the Chairman, Mr. Robert Wigram Crawford, to the Hon'ble the Governor of Bombay. With the re-publication of this, our readers will, for the present, rest content, those who desire entering on details, will find the whole published in the columns of our esteemed contemporary the "*Telegraph.*"*

To the Hon'ble L. R. Reid, Esq.
Governor, and President in Council, Bombay.

Hon'ble Sir,—On the 22nd of August last I had the honor of addressing a letter to your Hon'ble Board, intimating on behalf of the Provisional Committee of the Great Indian Peninsula Railway Company, the advanced state to which the surveys and preliminary enquiries, having reference to their undertaking, in this country, had been brought, and soliciting information in detail as to the different points on which Government would require to be satisfied, before

* See also Report, Maps and Papers of Great Indian Peninsula Co. *W. Lewis & Son. Finch Lane Cornhill.*

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the Company should be deemed entitled to the necessary powers for the construction of the Railway.

It would appear, from a communication with which the Committee had been recently favored by your Hon ble Board, that no directions can be given regarding Railway undertakings on this side of India until an intimation of the views of the Hon'ble the Court of Directors on the subject shall have been received. The committee, however, having now before them in a complete form, the statistical documents framed by Mr. Chapman, the Manager of the Company, prior to his departure for Europe,—together with the reports, and plans, and sections, prepared by Messrs. Clark and Conybeare, relative to the proposed lines of Railway, the whole of which papers, taken together, supply abundant evidence on which to found an application for legislative sanction, are anxious to submit their entire case for the consideration of the authorities; and they have therefore requested me now to wait upon your Hon'ble Board with the various documents noted in the margin, and to solicit the favor of your early attention to them, in order to their being handed up for the examination of the Supreme Government and the Hon'ble Court of Directors with the least practicable delay.

Your Honor in Council will perceive, from those papers, that it is proposed to construct a line of Railway, commencing at some appropriate spot near the Fort of Bombay, passing across the low lands called the Flats, and reaching Salsette by way of the Sion Marsh—thence skirting the Eastern side of Salsette, over an easy country—and crossing to the main land at the village of Chendanee near Tannah. On entering the Concan, a range of hills presents itself, the turning of which would involve a considerable circuit; but one of these—Godadunghur—is pierced by a tunnel of 1,427 yards, and the line then crosses the plain of Kalian, and is thence carried, by a tunnel of 1,620 yards, through the Oombernaut hills, and after traversing the valley of the Oolassa, and crossing that river and its tributary the Bervee, passes up the ravine of the last named stream over a band of broken and rugged country called the Chone Jungles, and proceeds towards Moorbar. At a distance of fifty-eight miles from Bombay the line leaves the Bervee, and descends through the Kholeton tunnels into the valley of the Kala, in which it generally remains as far as the foot of the Ghaut. The inclined plane commences at Morosee, nearly seventy-nine

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miles from Bombay; it is 10,267 yards in length, the steepest inclination being one in fifteen, and the average one in eighteen. The actual mode of ascent has not yet been definitively fixed; but Mr. Clark has estimated for the employment of stationary power "in the shape of three pair of engines working endless ropes," a method by which it is certain the incline can be conveniently and economically worked, though it is exceedingly probable a better one may hereafter be proposed. From the summit of the Ghaut the line proceeds to Koobee, a distance of 3,334 yards; and from the last named place takes a course between the Kristnawuttee and the precipitous range forming the northern boundary of the Malsej Ghaut valley, until it reaches the Alla Khind, a further distance of 21-27 miles. The next division of the line is 32-87 miles in length, and extends as far as the Pera, the Hurreechunder range, and afterwards the Amboreh Khind, being tunnelled to admit of its passage. The detailed surveys cease at the Pera, about 108 miles from Bombay; but Mr. Connybeare has further examined two routes towards Ougein and Indore, and a third towards Hoosungabad, and Mr. Clarke has effected a careful reconnoisance of the country in the direction of Sholapore, of which latter operation a report is herein enclosed for the information of your Hon'ble Board. It is unnecessary in this place to particularise the various works which will be required by the character of the lines, or again to institute any comparison with the view of shewing the advantageous nature of the selection which has been made, as the Committee have already brought the subject so fully under the notice of Government in their letter of the 6th of June last: suffice it to add, that although the amount of earth-work is exceedingly small, the line, for the whole distance from Bombay to Alleh, (with the single exception of the Ghaut ascent) presents first class curves and gradients, while that to the north of Alleh, which it was at first thought would involve numerous difficulties, will come at least within the second class of Railways, according to the English category. Detailed information on these points will be found in the reports of the Engineers; and I will therefore quit this part of the subject, and proceed to refer briefly to the various other facts and computations upon which the case of the Railway is founded.

The total cost of the line from Bombay to Koobee, is estimated at £981,027—to Alleh at £1,208,714—and to points

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near " the limits of the Gungathuree in one direction and beyond Seroor in the other," at £1,863,053.* The working expenses, as computed by Mr. Clark, amount to £74,021 for the line as far as Alleh, including the Ghaut incline, and it is proposed to take £22,357 per annum as the probable cost of working the above branch lines. Thus it is calculated, that 176 miles of Railway, from Bombay to the Pera and Mhuse, will cost £1,863,053, and may be worked for £96,378 per annum. The object of the statistical enquiries that have been entered into, has been to show, that a traffic now actually exists, which will suffice to defray this annual expense of working, and leave a surplus sufficient to yield a fair dividend on the capital expended in construction.

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* Mr. Chapman's printed papers, from which these calculations are taken, were compiled before the completion of the estimates for the lines above the Ghauts, and the cost of these latter was obtained by extending to them, that of the line across the Concan, as reported upon by Mr. Clark. The estimates having now been completed, it becomes necessary to add their actual result, which is as follows (the estimates being for lines of a quality equal to the best English lines):—

Line from Bombay to Koobee, as above . .		981,027
Line from Koobee to Alla, 21-27 miles (exclusive of Land compensation and working stock) according to the estimates of Mr. Conybeare . .	167,726	
Additional working stock required for 21-27 miles (the estimates of Mr. Clark being sufficient in certain particulars for the whole line) . . .	19,944	
		187,670
		£1,168,697
Branch from Alla to the Pern River, 33-18 miles, exclusive of land compensation and stock, according to the estimates of Mr. Conybeare	341,840	
Addition working stock required for this branch	32,198	
		374,038
Branch from Alla to Mhuse, 36 miles, as assumed by Mr. Clark on the average cost of the line in the Concan, including additional working stock		384,584
Total cost of the proposed lines . .		£1,927,319

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It has been considered advisable, for many reasons, to exclude from the range of investigation, all merely speculative or conjectural points of enquiry; and to this end no return whatever from passengers has been calculated on, and the amount of goods traffic looked to, has been merely that which at present exists. But that passengers in considerable numbers will eventually be obtained, and the traffic in merchandise be greatly augmented, from causes rising out of the establishment of the Railway, the Committee, I believe, entertain no doubt whatever. The experience of Railway undertakings in other countries, must fail us entirely here, if the results just named do not ensue.

In the paper marked C. and headed "General statement of expected traffic," will be found a series of minute and carefully compiled Statements, showing the various sources, character, and amount of the traffic, which it is believed will be accommodated by the Railway.—Excluding Salt (which is treated of in a separate paper) we have upwards of 100,000 tons of merchandise and produce, of which, by far the greater part has been ascertained, from official data, to pass now to and fro on or near to the proposed routes, and the remainder (which is but a small proportion) is estimated on grounds which, if not guaranteeing the most rigid accuracy, can have led only to error on the safe side. The details necessary for the verification of the statements now submitted, are in the possession of the Committee, and can be supplied at any time, if required by your Honorable Board. Of the actual quantity of salt conveyed into the interior and consumed by the native inhabitants, there is no official record; and, as will be seen on a reference to the paper D., Mr. Chapman has been compelled, in consequence, to resort to a method of computation by which the larger order of statistical questions are frequently determined. He has taken a certain area of country to be supplied with Salt from the coast by means of the Railway; calculated the probable amount of population within this area; and determined, from the best information extant, the average consumption per head per annum. The area he has shown to be about 112,061 square miles, the population 100 per square mile, and the average consumption 16lbs; whence a total annual consumption of 80,043 tons is the result. This, added to the 100,000 tons of goods and produce, makes up the 180,000 tons, which it is expected will be conveyed annually by the Railway.

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The next point to be established, in order to complete the data for final calculation, was the rate of charge for carriage which the Railway Company might safely fix upon; and before determining this question, it was necessary to ascertain, from a variety of sources, the cost of carriage, in different places, at different seasons, and under different classes of circumstances, at present incurred in the interior. The evidence collected by Mr. Chapman on this branch of the subject is most ample and minute, and the inference which he deduces from it is one in which the Committee think your Honour in Council will readily concur. It appears that within the range of the proposed lines, the lowest charge for bullock carriage is 4½d. per ton per mile, and for conveyance by carts in one instance only so low as 2¾d. The latter rate is at present taken as one which may be charged by the Railway; but any increase of traffic beyond that which has been calculated in these papers on a very narrow basis, would of course admit of a considerable reduction in the charge.

The trunk line from Bombay will extend as far as Alleh, at which point the bifurcation to the Pera in the North-East, and to Mhuse in the South-West direction, will take place. For the first 109 miles, therefore, the entire 180,000 tons, at 2¾d. per ton per mile, will, it is estimated, be carried; and this will produce a revenue of £224,812 per annum. From Alleh to the Pera, a distance of 31 miles, it is assumed that half the above quantity, or 90,000 tons, will be conveyed; and from the same place to Mhuse (36 miles) the remaining half of the amount; so that a revenue of £31,969 and £37,125 respectively, from the two lines beyond the point of bifurcation, will have to be looked for; which will make up the total receipts to £293,906. But as the charge for the six miles of ascent up the Malsej Ghaut is proposed to be doubled, on account of the extra expense of working the incline, an addition of £8,250 will have to be made to the last-named amount; and thus the aggregate revenue for the 176 miles of Railway may be stated at £302,156.

The annual cost of working, has been estimated at £96,378; and a balance will thus be left of £205,778, which is equivalent to a dividend at the rate of £11-0-11 per cent on the cost of construction.* In the paper marked A., being a prefatory

* This will now be reduced by a few shillings, owing to Mr. Conybeare's estimates having turned out rather higher than was anticipated.

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letter to the Chairman of the Provisional Committee, Mr. Chapman has clearly pointed out the probable effects of any supposable error; and in a case where a distrust of estimates may possibly prevail, it may be useful to direct the attention of your Honourable Board to the observations adverted to.

A brief outline has now been given of the results of the surveys and enquiries in which the Officers of the Company have been engaged, and which results are elaborately detailed and illustrated in the documents, which form the accompaniment to this communication.

Before concluding, however, I beg permission to offer a few observations on some points in connection with that part of the great question of Indian Railways, which will most peculiarly commend itself to the attention of your Honourable Board, namely, the nature, extent, and value, of the advantages likely to be derived by Government and the public, from the introduction and maintenance of this improved mode of intercourse. To bring fully under the review of your Honour in Council, all the various benefits—political, social, commercial, and moral—which might be expected to spring, in a country like India, from the judicious establishment of Railways, would require far more space than the limits of the present letter will allow; but a few leading facts may be concisely pointed out, which will perhaps prove useful as suggestive of those more extended considerations into which circumstances do not now permit me to enter.

The effect of Railways in Europe has been usually to double or treble, and sometimes quadruple, in the course of a few years the traffic existing on the original lines of communication. In England, as is well known, the returns have been, in the great majority of cases, derived principally from the conveyance of passengers; and even in those districts where merchandise and produce are plentiful—where no canals, or other means of competition, exist,—and where, consequently, the carriage of goods has formed a considerable part of the business of the Railways, the course pursued by the Companies, in reference to the fixing of their rates of charge, has not been such, as to afford a fair test of the powers of the Railway system, in augmenting and extending commerce. But in Belgium, where the charges are low, it is a fact, that in a single year (1844), a traffic in goods and cattle, of 33,000 tons, was increased to 52,000 tons, and this without any diminution whatever of the

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Canal traffic, with which the Railway competed. It can hardly be supposed that when the fertile districts of Western India, hitherto in a great measure unsupplied with roads, and totally without river or canal communication, come to be intersected with lines of Railway, assisted by feeders, which will attract and accommodate the traffic of the country and furnish the means of rapid and inexpensive transport to the coast, a less favourable effect than the above will be found to ensue. Without dilating upon the probable causes of this expected improvement, which will doubtless readily suggest themselves to your Honourable Board, it may be advantageously remarked, that in exact proportion to the increase of traffic will of course be the gain of Government and of the Native community at large. Augmentation of Revenue, as well from land as from Customs and other dues, to the one, and amelioration of moral and social condition, to the other—will be the clear and undoubted results. Bombay derives its chief importance from its favourable position as an entrepot of trade, and any plan whereby the commerce passing through it may be rapidly transmitted, and increased, seems to have the strongest claim on all who are interested in the prosperity of the place.

I have already, in a former part of this letter, had occasion to refer to that most important branch of our general traffic, —the trade in Salt; and I may now be permitted to draw the attention of your Honourable Board to the interesting fact, that the marshes and inlets in the neighbourhood of Bombay may be made to furnish a supply of the above indispensable article sufficient for the consumption of all India, and that the intrinsic cost of manufacture is comparatively so small, that were a Railway made into the interior, with the requisite branches, as now proposed, the increased consumption of Bombay Salt—consequent on the reduction of prices—that would ensue, would lead to a proportionate increase of this important item of Revenue. The Memorandum by Mr. Ayrton which is appended to this letter, will show this in a very clear light. Thus another strong reason presents itself for the prompt and efficient support of Government.

The facilities afforded by a Railway in time both of peace and war—but particularly the latter—for the movement of troops, and the transport of military and commissariat stores, must be obvious to your Honourable Board; and if these advantages have become apparent, and been formally acknow-

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ledged, in England, where disturbances calling for the presence of large bodies of soldiery are little likely to arise, they must be permitted to be, here, of far greater value; for within the expanse of territory over which the Honourable Company's rule now extends, there will of course not infrequently be cause for military interference; and the means of expeditiously conveying troops and stores to the point where they may happen to be required, is therefore of the greatest possible consequence. Government would in this respect gain in two ways, first by the opportunity which might be afforded it of reducing the numerical strength of the Army, and secondly by the saving of time, and diminution in the actual cost of moving regiments and their followers, baggage, and stores, from one distant station to another.

Again, as matters at present stand, the Indian Postal arrangements involve great expense, and most inconvenient delay, in the transit of letters, papers, and parcels of all kinds. This evil would be obviated by the Railway (to the particular advantage of Government), and the system would be, generally, so far improved, that the existing rates might be reduced without the least detriment to the Revenue. Your Honor in Council will readily acknowledge that it is a point of much importance to the public service to have the Official despatches intended for transmission to Europe by the Overland Mails, made up to the same period, within one or two days, from all parts of India; and this end, it is clear, can be secured only by a Railway from Bombay, such as that now submitted for the consideration of your Hon'ble Board.

In addition to the considerations now briefly adverted to, there are others of a more general character, as, for example, the effects of a Railway in opening channels for personal intercourse with the natives of the interior—in leading to the diffusion amongst them, of the advantages of education—and in rendering available for their use many of the appliances of civilised life and agricultural and manufacturing industry, to which they are at present strangers; but on these incidental topics I will not enlarge, feeling satisfied, as I do, that all such points will receive the best attention on the part of a Government which has ever displayed so strong a desire to promote internal improvement, and further the interests of the people.

It only now remains for me to state that the Committee are deeply anxious for an early and favorable consideration of

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their project at the hands of the authorities, and that they will be most happy to supply, whenever required, any additional information that may be deemed necessary in subtantiation of the important facts now adduced. They trust, however, that their case is of so complete and conclusive a nature, that your Hon'ble Board will find no difficulty in handing it up without delay, to the superior authorities, with that powerful recommendation in its favor which the frequent strong expressions, on the part of your Honor in Council, of interest in the progress and success of the undertaking, has led them so confidently to anticipate. The Hon'ble Court of Directors having now the subject of Indian Railways under their consideration, it is of course an important point for the accompanying papers to be submitted to them without delay, and I trust, therefore, that your Honor in Council will confer on us the favor of forwarding to England copies of the various documents herein enclosed, by the departing Mail.

I have the honor to be, Hon'ble Sir,
Your most obedient servant,
(Signed) R. W. CRAWFORD,
Chairman in Bombay of the
Great Indian Peninsula Railway Company.
RAILWAY OFFICE, BOMBAY, 13*th October*, 1846.

Whoever examines the above, will most readily admit that it is a very different document indeed from any which has hitherto been laid before them on railways in India. The estimate of the traffic seems, so far as we are able to judge, to be moderate and reasonable, and on many points considerably within the limits of what may be expected to be raised : and if the outlay be not greatly underrated, the return to be looked for ought to satisfy the most sanguine.

Bombay Times, Nov. 16*th*, 1846.

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NOTE

TO THIRD EDITION.

REPORT OF R. STEPHENSON, ESQ.

To the Directors of THE GREAT INDIAN PENINSULA RAILWAY COMPANY.

GENTLEMEN,

HAVING had for some time the various documents relative to your proposed undertaking under consideration, I now beg to lay before you such remarks as the perusal and study of them have suggested.

When I commenced the examination of the various voluminous plans and documents, I did so with considerable diffidence, because I felt that any opinions which I might express, based on documentary evidence alone, would be likely to mislead rather than to guide, in the consideration of an undertaking of such extent, and situated in a country to which I was a stranger. My difficulty in this respect, however, was almost entirely removed by the personal communications of Mr. Chapman; his intimate knowledge of the country through which the projected line is to pass, and his clear and detailed verbal descriptions of the physical features of the surface (which he has given me at great length), accompanied by sections furnished by your engineers, Messrs. Clark and Conybeare, from actual levels, have made me feel so conversant with the chief objects and characters of the undertaking, that I venture to express the opinions I have arrived at, with nearly as much confidence as if I had myself visited the country.

In an undertaking of this description, the two main points to be considered are, the commercial wants of the district, and the engineering facilities for supplying them.

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In reference to the first, they are succinctly described in a letter addressed by Mr. Crawford to the Bombay Government, 6th June, 1846. From this document it appears that the great commercial object to be obtained is the opening an easy communication between the rich producing districts of the interior, called the Deccan, extending in a line nearly due north and south from Candeish to Sholapoor, with the Presidency and Port of Bombay.

A very cursory examination of the map of this part of the Indian Peninsula is sufficient to show to the engineer that the principal difficulty to be overcome consists in surmounting the Syhadree range of mountains, which stretches uninterruptedly between these two districts. A further study of the map renders it evident, also, that the insular position of Bombay imposes another, and very important, condition on the direction of the line, irrespective of the range of mountains just named, viz., that it must proceed from Bombay through Salsette to Tannah, this being the only point where it is feasible to form a connection by railway between the island and the main land. Tanneh may be, therefore, regarded as the starting-point; consequently, every approach towards the various passes over the Ghauts must, in a great degree, be governed by it.

For, passing the Syhadree range, your engineers have selected the Malsej Ghaut; and, as the passage of this point is the only one which presents any formidable engineering difficulty throughout the line, it has had my special attention.

Looking carefully at the map of this part of the range, I was struck with the circumstance that, in the vicinity of the Malsej Ghaut, several streams seemed to radiate from it in different directions as from a focus, which led me to suspect that the lowest Ghaut had not been selected for passing this range of mountains. I called Mr. Chapman's attention particularly to this point, as one of the utmost importance, since any material improvement in it might possibly bring the gradients of this part of the line within the range of locomotive instead of stationary power as at present proposed. Mr. Chapman had, fortunately, the information at hand both as regards the principal levels (which are partly given in Lieut. Col. Sykes' interesting Memoir of the Geology of a part of the Deccan * and Syhadree range,† and partly from his manus-

* Often written Dukhun.

† The correct name of the Great Western Ghauts.

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cript Report of the same district in the possession of the East Indian Company), and also the characters of the districts and the difficulties which would present themselves in other parts of the line, supposing any other Ghaut were adopted.* The letter which Mr. Chapman addressed me on this is so carefully and clearly drawn up, that I cannot for a moment withhold the expression of my conviction that the Malsej Ghaut has been judiciously and properly selected. The other parts of the line proposed by your engineers do not call for any remark from me,—their reports give all the necessary details which appear to have been very carefully studied, and, as far as I am able to judge, have been discreetly carried out.

As designed, therefore, your undertaking may be described as a line running north and south from the Pera river through Alleh to Mheuse near Seroor, a distance of about seventy miles, with a transverse line from Alleh to Tannah and Bombay, a distance of about 100 miles, without presenting any serious engineering difficulty, excepting at the Malsej Ghaut, which is confined to a distance of about eight or nine miles, where the gradients are such as to require either stationary engines or locomotive engines, with ropes so adapted as to work in conjunction. This latter method I think would be preferable; it is less costly, is better adapted for a fluctuating traffic, and is more economical for the amount of intercourse which is calculated upon in your statements of traffic.

With such an arrangement there can be no difficulty in working the traffic with regularity, dispatch and economy. The length of this difficult ascent is, no doubt, unusually great, and the proposed gradients very severe; but, excepting in the length, it does not differ from examples which exist in several mountainous countries where railways are in daily operation. Looking, therefore, at the facilities which are reported by Mr. Clark and Mr. Conybeare to exist throughout the remainder of the line, I cannot but regard the whole as easy of execution. The construction of the series of tunnels in the ascent to the Malsej Ghaut is the only work which require an unusual time for completion, since the great height of the ground over the line of tunnels would render shafts inordinately expensive, if not absolutely impracticable. Several

* These facts were obtained chiefly from the letters of Dr. Gibson Superintendent of the Government Botanical Gardens and Conservator of the Forests, in Western India; of Major Liddell, Commandant of the Police Corps of the Poona Collectorate; and of Mr. Langford, Collector of Ahmednuggur.

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years would certainly be required for the completion of these works, but this fact need not, I think, interfere with the immediate prosecution of that portion of the line over the Concan, extending from Bombay to the western foot of the Ghauts, a distance of eighty miles.

The next point to which I may direct your attention is that of cost; and here I fear that my views and those of your engineers will not coincide.

Their estimate for a double line does not exceed £12,000 per mile, and in arriving at this they have evidently taken much pains to collect the prices for which work is now done in the districts traversed by the proposed railway. I do not doubt the accuracy of these data, nor that of the calculations of the amount of work to be performed as described by the sections; but experience in this country as well as in tropical climates, in executing work of a novel character, leads me to distrust any conclusions arrived at by such methods. I am, of course, unable to state the precise extent to which my notion of cost would exceed that calculated upon by your engineers, but I would certainly not venture upon recommending you to reckon upon less than 25 per cent. above their estimate, or say about £15,000 per mile.

In considering the cost of your undertaking, I would also suggest that you limit your expenditure in the outset to a single line of rails between Alleh to the Pera river, and from Alleh to Mheuse. Throughout this distance there appears no immediate necessity for the formation of double lines; the traffic will evidently be divided at the bifurcation near Alleh, probably into nearly equal parts, and the distance in either direction from that point within the command of two engines which might be worked with perfect safety for the amount of traffic as shown by the table. In examining the estimates of the amount of traffic submitted to me by Mr. Chapman, I have, of course, had the advantage of his verbal explanations; indeed, without this privilege I could not have offered an opinion on the subject, which, under every circumstance, is so difficult to treat with accuracy; but in this department of railway calculations it fortunately happens that the amount of traffic is rarely if ever over-stated when ordinary care is taken to avoid hypothetical items. In the present instance, Mr. Chapman appears to me to have been exceedingly scrupulous; he has chiefly drawn his data from official documents, which I take it for granted, are indisputable, and he has, moreover, avoided reckoning upon any large increase in the existing

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intercourse: I am inclined, therefore, to believe that the tonage is rather under than over-stated.

In the statement of net proceeds, the expenses are taken at about £600 per mile, which I should think ample, since the price of labour is exceedingly low, and advantage of which will be felt after the line is opened, and the natives accustomed to the duties of working and maintaining railways.

This is an advantage that would not be felt in the first construction of the works, which will explain my reason for recommending an addition to the estimate, whilst I do not suggest it in reference to the working expenses.

In conclusion, gentlemen, I hope these few observations will sufficiently explain to you the views which I have taken of your project, and I trust that they will enable you to decide upon the proper course to be adopted in carrying out a work, the importance of which has grown upon me exceedingly since I commenced the examination of the documents laid before me. Whether such a gigantic work—in a distant country, where the resources, both for executing and working it, are necessarily limited, as compared with European nations, where railways have been so successfully established—should be left entirely to private enterprise, is a question I must leave for those to decide who are intimately acquainted with India and its people.

In an experiment of this kind, so fraught with benefit to the country, whatever may be the results to the original promoters, I cannot help thinking that aid from the Indian Government is not only desirable, but necessary.

However this may be decided, I am certain, from the information which has already been collected, there is no country where the advantages flowing from the introduction of railways will be more signal than in India; and I believe that no country will participate more promptly in the beneficial consequences than Britain.

I am, gentlemen,
Your most obedient Servant,
(Signed) ROBERT STEPHENSON.

24, Great George Street, Westminster,
20th January, 1847.

"Should an arrangement at any future time be concluded for the passage of troops through Egypt, the importance of the Great Indian Peninsula Railway would be vastly increased,

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CONCLUSION.

"In parts where the permanent settlement has been established, (says the Calcutta Review in allusion to railroads) the revenue will be more easily collected; in other parts, the land will be at an improved rent, as it will necessarily be improved in value. A railroad in this point of view will be a more valuable acquisition than Sindh,* or the ceded Sikh provinces. We believe it impossible to form too high an estimate of the manner in which it would develop the agricul-

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for, as a glance at the map will show, it would then form a portion of the Steam Communication by which our troops would be most speedily conveyed from England to almost any part of India. And even with our present limited means of transport through Egypt, officers joining their regiments, might often save many weeks in reaching their destination. This becomes a point of immense importance in any emergency, such as has twice occurred within the last four years, when all officers belonging to the army in India, and absent on leave in Europe, were by one order required to join their regiments without delay."

Letters addressed to the Right Hon. Lord Wharncliffe by T. Williamson Esq. C.S. late Revenue Commissioner, Bombay.

† It is to be hoped so!—O. I. P.

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tural capabilities of the country. In the Report of the Ganges Canal, which was intended to run from Hurdwar to Allahabad, we find a contrast drawn between the evils which the canal would mitigate or prevent—such as famine—and the malaria which it produced, occasioning sickness, and disease in the contiguous population. No malaria attends a railroad: it pretends not indeed to prevent a failure of crops, but it does better, it facilitates commerce, multiplies the power of capital, and pours a supply wherever there is a demand, and enables charity to perform its object and mission."

"The natives of India are concerned in it" (railway communication) "The undoubted effect would be, in a constantly augmenting ratio, to unfold the unknown mineral resources of their world-famed land —vastly to enhance in value the products of its prolific soil—widely and cheaply to diffuse the objects of personal comfort, and refined social enjoyment—and annually to save the lives of thousands that must otherwise perish from the hazards, the fatigues, and the exposures of the present rude and semi-barbarous mode of travelling. The merchants of England, and of every realm within the empire of civilization are concerned in it.

"Philanthropists of every name are concerned in it (railway communication). Its tendency would be to save the time and strength of devoted labourers

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in visiting different and widely distant spheres of usefulness—more speedily and economically to concentrate the material means and instrumentalities of inprovement in favourable localities—and more rapidly and successful to multiply those radiating points, whence the light of Science, and Art, and true Religion may emanate all around."

"The mighty impulse which it would impart to the development of the exhaustless treasures of so highly a region favoured, and to the awakening energies of so multitudinous a people, could not fail to make itself felt on the shores of the Baltic and Mediterranean, in the mines of Cornwall, and the Backwoods of America, in the dockyards and harbours alike of the Atlantic and Pacific, and in every seat of manufacturing industry throughout the commercial world. The honour the dignity, and the glory of Imperial Britain are concerned in it. The complete permeation of these "climes of the sun," by a magnificent system of Railway communication, would present a series of public monuments vastly surpassing, in real grandeur, the aqueducts of Rome, the pyramids of Egypt, the great wall of China, the temples, palaces, and mausoleums of the Great Moguls—monuments not merely of intelligence and power, but of utility and beneficence, which would for ever wipe away the fiercely indignant reproach, that, "'were we to be driven out of India this day,

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nothing would remain to tell that it had been possessed, during the inglorious period of our dominion, by anything better than the ourang-outang, or the tiger.'" A reproach more undeserved we believe was never heard, and could only have been uttered by some canting orator, the paid champion of liberty and equality, and the slave of party.*

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* The Eastern Sage, Desh-u-lubun Ocharik, in writing to one of these hollow declaimers, says :—

"Nothing of good can originate with them; they (The East India Company) have erred, you would make out from their very first illegitimate birth in good Queen Elizabeth's virgin time, up to the present portentous era of free trade and political economy. Thus they have blundered and bungled on, from step to step, into the lamentable, undisturbed possession of one of the largest and finest Empires in the Universe; their very pre-eminence in the East—the quiet peacefulness of their subjects—the unobstrusive and simple machinery of their local governments—the silently progressive amelioration of the population committed to their charge, and the extensive diffusion of education and useful knowledge—the numerous institutions for the sick, the indigent, and the uninformed, embracing every class, Hindoo, or Mussulman—their delicacy towards ourselves (more, I may venture to say, than they exhibit towards their own European servants, civil or military) and scrupulous regard for the protection of the lands, religion, ordinances, and feelings, of the millions they govern. Nay, the very state itself of the government, which obtains loans from us at half the interest for which the traders of Calcutta can procure money ;* these and every other just and honourable characteristic of our present rulers, are misrepresented, vilified, decried.

"No one aquainted with our ancient history and govern-

* "During the Burmese war, the East India Company borrowed money at five per cent; while the most respectable merchants and agents of Calcutta were paying ten."—Letter of Desh-u-lubun Ocharik of Calcutta.

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Were we driven out of India to-morrow, we should leave behind us glorious monuments of our rule in the temples reared to the God of the honest, brave and merciful Feringee—in fields reclaimed from the wilderness—desolate hearths restored—ruined cities and towns rebuilt: instead of anarchy, rapine, and spoil—protection, contentment and peace!

"Inglorious period of our dominion!" We almost blush to imprint upon our page so foul a stigma, while the sands of the Sutlej are still red with the blood of our enemies, while the voice of Europe declares that our bravery in the field is only to be equalled by our generosity to the vanquished; at home our victorious chiefs have been equally awarded the laurel crown and civic bay—we admit, however, that we have left much undone for the people of India, and in nothing have we been more culpable and impolitic, than having neglected for so long a period the means of communication.

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ment, can deny, that however many of us may complain of the loss of dignities and immunities formerly, but precariously, possessed, the mass of our people have derived many substantial advantages from British connection, which has not only rescued us from the numerous evils which we suffered, under our native rule, but has gradually led to our incorporation as a part of the British Empire, to the diffusion of literature among us, the introduction and promotion of a knowledge of the sciences, and the benefit of equal laws, and a distribution of justice similar to that enjoyed by the parent state." —*Letter of Desh-u-lubun Ocharik of Calcutta.* Smith, Elder, & Co.

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The Romans of old, like the Czar of the present day, attended to roads, as an important element of policy and power ; and the ignorant serf of the north enjoys under the iron despotism of the black Eagle of Russia, facilities for trade and intercommunication, which are withheld from the intelligent subjects of the wise and generous England.

We will not speculate on the momentous results with which this subject is fraught to millions yet unborn, how it speaks of a quickening and prevading civilization, remunerative labour, amelioration to the many, and the removal of superstition and prejudice ; and what accession will it not bring to us of riches, power and glory, by developing the resources of a mighty empire, hitherto almost without roads—by stimulating the industry of its inhabitants, whose natural intelligence has been either lost in apathy, or chilled by the petrifying influence of caste—while, —by the easy and rapid concentration of our troops, our power must become irresistible ;* and the glory would be ours of having done our duty to the hundred millions of our brethren committed to our charge—attaining at once a more assured and consolidated empire—a vastly augmented revenue—with

* A friend of the writer's heard the Governor-general of India state, that with railways our army would at once be double in effective force.

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a more industrious, and therefore, a richer and a happier people !

While the foregoing sheets were passing through the press* the despatch of the Bengal Government, regarding the introduction of railways into British India, has been received at the India House.

The sentiments of the local government will, we feel assured, be in accordance with the recommendation of the railway commission, and will give those projects,† for connecting the seat of supreme government with the N. W. Frontier that prominence and consideration which their pre-eminent political, and commercial importance, demand.‡

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* Note to the 2nd. Edition. In the month of July last, (1846.)

† Great Western of Bengal, (Calcutta to Rajmahl) and the line from Allahabad to Delhi.

‡ Note to third Edition. We need not say that this prediction has been fully verified. The only concession granted by the authorities being given to the East Indian Railway Company, whose project is to connect Calcutta with the N. W. Frontier. The great Western of Bengal participates in the concession having merged in the East Indian Railway Company by amalgamation of interests.

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APPENDIX.

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(A.)

THE ultimate effect of the extension of an uniform railway system, is still more clearly shewn in the operations of the clearing house.

We are fortunately enabled to furnish an account of this interesting and valuable institution, from a pamphlet* lately printed for private circulation, by its ingenious author, Mr. B. Morrison.

It appears, that soon after the opening of the continuous lines of railway between Liverpool and London, it was found that travellers would not be content with the mere acceleration of speed, but required to be carried through at one charge, and if possible by one conveyance. The same demand was made for goods. This arrangement was carried into effect; but although the public were better served, the accounts of the companies interchanging fell

* "The origin and results of the clearing system which is in operation on the narrow gauge railways."

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into sad confusion. Each company had charges against those which ran over its lines, and in like manner owed money to those lines, giving rise to an interminable affair of cross accounts. Then, as railways increased, some were prosperous and some were poor. The prosperous were well supplied with carriages, waggons, trucks and all that comes within the meaning of 'railway stock,' the poor companies, had as little as they could help, and made up for the deficiency, by unacknowledged borrowings; so that, altogether, the interests which should, for mutual and public good, work most harmoniously, clashed in a manner, that could be pleasing only to the lawyers of the disputing companies. The solution of the litigious maze, was found in a plan derived from that of the City clearing house, which was carried into effect under the auspices of Mr. Glyn and Mr. Hudson.

On the 2nd. of January 1842, the system of the Railway Clearing House came into operation, on the railways extending from London to Darlington in one direction, and from Manchester to Hull in another. It was adopted, at subsequent periods, by the companies whose railways extended from Darlington to Carlisle, Sunderland, Hartlepool, and Scarborough; and from Birmingham to Gloucester, Birkenhead, Liverpool, Fleetwood, Lancaster and Manchester. And in a few months it will be in

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force, in all the railways included in the area defined by a line passing from London through Gloucester, Liverpool, Fleetwood, and Glasgow, to Edinburgh; and returning by Berwick, Newcastle, Scarborough, Hull, Yarmouth, and Cambridge, to the Metropolis; or, in other words, in all the narrow gauge railways in Great Britain, lying North of the Thames, with the exception, of the few short lines, which are beyond the limits of the area just described.

The main principles of the system thus widely diffused, are first, that passengers shall be booked through, at all principal stations, and conveyed to their destination without change of carriage; that the horses and cattle, shall likewise be sent through without change of conveyance, and that goods shall, in the same way, be carried through without being either shifted or re-assorted. Secondly, the companies respectively shall pay a fixed rate per mile, for such carriages and waggons, not their own property, as they may use; and a further sum per day by way of fine or demurrage for detention, if kept beyond a prescribed length of time; and lastly, that no direct settlement shall take place between the companies in respect to any traffic, the accounts of which have not passed through the railway clearing house.

In order to work out the clearing principle, there are sent daily from each of the clearing house stations, (including all the principal booking stations

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of every line, forming a part of the railway union)

1st. A return of the passengers booked through.

2nd. A return of the horses, private carriages, and cattle booked through.

3rd. A return of the parcels booked through.

4th. A return of all the carriages, waggons, &c., which have arrived, or been discarged, either loaded or empty.

From these returns the accounts of what is due to, and owing by, each company, is made out at the clearing house, and after being examined and approved by each company. "The final settlement of the accounts is effected by the railway clearing, paying, or receiving the balances, as the case may be, through the hands of the bankers, who act as agents to the several companies. In this way, all the transactions of one company, with all other companies, amounting frequently to many thousand pounds a week, are cleared weekly by a sum, seldom exceeding a few hundred pounds."

The means which the clearing house possesses, for having each vehicle, from the moment it leaves the parent line until it returns to it, and the plan adopted of charging mileage for stock used, and demurrage for stock detained, have put an end to the practice before referred to, of borrowing from

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neighbours, to supply an improper deficiency in carrying vehicles.

From these returns, for the year 1845 we find that 517,888 passengers were each conveyed through an average distance of 146 miles—the average length of the lines travelled over, being forty one miles, so that each passenger travelled over four railways on an average, and must have passed three junctions or points of conveyance—to accommodate these passengers, 59,765 railway carriages and 5,813 trucks, carrying private carriages, were sent through. There were also sent through in the same year, 7,573 horse boxes, 2,607 post offices, and 180,606 goods waggons, besides waggons conveying minerals, of which no record is kept at the clearing house.

"There are other circumstances connected with the clearing house, which render it a most valuable institution. The control is vested in a Committee, composed of all companies, who form part of the union. Their meetings tend to produce harmony, and also uniformity, in their respective arrangements, and to impose a check on the disposition to introduce diversities of system, which, for some motive or other, railway managers have so often evinced.*

* Extracted from the work of Mr. Samuel Sidney on the evidence before the Guage Commission—See also Mr. Morrison's phamphlet on "The origin and results of the clearing system &c."

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(B.)

BENGAL PRICES.

Average amount of wages and prices of materials on the spot.

Masons or bricklayers, per man, per day,	£0	0	6.			
Carpenters, " "	0	0	6.			
Labourers, (able bodied) " (three of whom are equal to one European.)	0	0	3.			
Ditto. " per month.	0	5	0.			
Cost of excavating to an average depth of twenty feet, and removing the earth to a distance, for every five hundred and seventy-four cubic feet, or twenty-one and three quarters cubic yards.	0	2	0.			
Cost of one hundred cubic feet of masonry,	1	8	0.			
Ditto. Ditto of arched masonry,	2	0	0.			

MATERIALS.

Bricks—11 inches—per thousand,	0	7	0.			
Ditto. " " for arching,	0	13	0.			
Chunar stone, (Calcutta price) each eighteen inches square and two inches thick, per score,	0	16	0.			
Tiles, eighteen inches, per hundred,	0	4	0.			
Ditto. " " (pan or roof),	0	2	6.			
Lime, per cart load, (14 cwt.)	0	4	0.			
Sand (washed) per hundred ferrahs,	0	14	0.			
Timber, (rough) teak per ton.	3	0	0.	to	5	10 0.
" Saul "	2	0	0.	"	3	10 0.
" Sissoo, "	1	0	0.	"	2	10 0.
Teak, in plank six inches thick, (Calcutta price) per ton,	4	10	0.	"	5	10 0.
Piles per hundred.	1	50	0.			
Cost of conveying materials by land, per ton, per mile,	0	0	3.			
Ditto. By water, exclusive of loss of interest and insurance,	0	0	1.			

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(B continued).

BRIDGE OF THIRTY FEET. WATERWAY EXCLUSIVE OF TOWING PATH.

From report on Ganges Canal, 1845. Page 56.

	L	*B*	*D*	*No.*	*Cub. Cont.*	*Cos. Rs.*		
Piers,	18	6	20	2	4,320			
Arch,	42	2	18	1	1,512			
Counter arch,	39	1	18	1	702			
Wing walls,	36	1½	15	4	3,240			
Cornice,	120	2	½	2	240			
Parapet,	120	1¼	3	2	900			
Pillars,	4	4	6	4	384			
Ditto. superstructure,	3	3	3	4	108			
Towing path foundations,	30	3	6	2	1,086			
Ditto. superstructure,	48	3	6	1	864			
Foundation curtains	30	3	4½	2	810			
Spandrils,	12	3	1½	2	108			
Flooring between pier and towing path,	18	3	1	1	54			
Total cubic feet,					14,322			
Deduct,								
Foundation of pier in rear of towing path,	18	6	4	1	432			
Grand total cubic content of masonry,					13,890.			
Of which say, 1512 cubic ft. of arched masonry at 20 rupees per 100 cubic feet,						302	6	4
12,378 ditto. plain ditto. 14 rupees per ditto.						1,732	14	9
Total cost of the bridge,						2,035	5	1. £203 10 7½

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(C.)

ENGLISH PRICES.

EARTHWORK IN EMBANKMENTS, CUTTINGS, &c.

	s.	d.		s.	d.
Common excavation, per cubic yard .	0	5	to	0	8
If basketed	0	6	"	0	9
If wheeled, ...	0	8	"	0	10
Ditto and staged, for every run, viz. 20 yards, add, ...	0	1½			
If carted, or otherwise removed a distance not exceeding 900 yards, add, . .	1	0	"	2	6
If beyond the distance, add proportionally					
NOTE.—If in tunnels, allowance must be made for the sinking of shafts and haulage of excavation in proportion to the depth of shaft and length of tunnel; also in excavating for bridges or other buildings, allowance must be made for working room and sustaining slopes, as well as for any other contingency that may arise in excavation or formation and the subsiding of banks.					
Unsoiling, per super. yard, without carriage	0	1½	"	0	3
If wheeled, per run of 20 yards, add .				0	0¾
If removed 900 yards, add . .	0	4	"	0	10
If beyond that distance, add proportionally,					
Soiling slopes of embankments or cuttings				0	3
Forming surface level of road for ballast	0	1½	"	0	3
Forming face of cuttings and embankments for soiling	0	1½	"	0	4
Forming drains each side of roads in cuttings, per yard lin. . . .	0	3	"	0	6

BRICKWORK.

NOTE.—The following prices are calculated at £14 per rod, taking the bricks at forty shillings per thousand, delivered to the works, including profit. For every shilling more or less, add or deduct per cube yard, fivepence halfpenny.

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	£.	s.	d.
Brickwork, in mortar, per cube yard . .	1	4	9
Ditto, in Roman cement	1	10	1
Ditto, if worked camber, per ft., superficial .	0	0	1
Ditto, if circular	0	0	1
Ditto, face pointed, in ash mortar . . .	0	0	2
Ditto, in cement	0	0	2½
Brick, on edge coping, in cement, per ft. run .	0	0	5
1½ brick ditto. ditto. .	0	0	8
NOTE.—Cement, asphalte, or hydraulic cement laid over arches, per yard superficial, from one shilling and ninepence to	0	2	9
Clay, well puddled, and laid over arches 6 inches thick, per sup. yard	0	2	8

The average price of stone in England, fit for building purposes, may be estimated at four and sixpence per cube foot when in the rough state.*

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* Vide—Engineer's Pocket Book for 1847.

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(D.)

TRANSVERSE STRENGTH OF WOODS.

A valuable article has appeared in the military repository, embodying in a table the results of a series of experiments performed on this subject, (tansverse strength of woods) at the gun carriage agency Kásipur (Cossipore). The woods selected were Bengal Sundri, (Soondree) Murany Sál, (Morung Saul) Gorakpur Sál, (Gorukhpore Saul) Rangoon Teak, Java Teak, Pegu Teak, Bombay Teak, Murany Tun, (Morung Toon) Bengal Deal, Norway Deal, and American Ash. The pieces experimented on were each seventy-two inches in length, two inches square, and sixty inches between the points of support. Amongst other results it appears that the Bengal Deal, though unseasoned, was equal to the Norway, each breaking with seven hundred and twenty pounds, and a deflection of two and a half inches. The great range in the strength of Teak, is one of the most curious and valuable of the results. The extremes are Rangoon and Bombay

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or Malabar 1175 and 591 pounds, giving a ratio of 2 : 1. Both woods were seasoned. The highest value of Bombay Teak was 889 pounds,* Bengal Súndri (Soondree) is the strongest wood tried, and required 1384 pounds to break it. Murang Sàl (Morung Saul) is the next 1319. It appears in general, that the woods are stronger for being seasoned; in the case of the Sundri (Soondree) the difference was remarkable, 1384 and 992 or 75. The greatest range of Sâl Chaokars (Saul Chowkers), and Daokars (Dowkurs) was 1319 to 1179, when seasoned; unseasoned it did not go below 1085—Murang Sal Battis (Morung Saul Batties) gave only 787. Tún (Toon), not seasoned, 667, and American ash 483.

Extracted from "*Gleanings in Science, Calcutta, March* 1829."

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* British oak ranks next to Rangoon Teak, in transverse strength. The iron-wood of Arracan, is approved of by the Railway Commission, for sleepers, but little is said as to its qualities, and nothing as to quantity or price.—O. I. P.

Note to 3d. Edition. The writer has since learnt from the best authority, that the Iron-wood of Arracan is admirably adapted for sleepers, and that it is cheap and abundant, it is frequently found composing forests of several miles in extent.

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(E.)

MODES OF TRAVELLING IN INDIA. AND FARES.

The natives of the lower provinces, generally go by water, as there is less fatigue attending this mode of transit, but the Up-country people generally prefer travelling on horseback or in carriages.

An European or a wealthy native going by Dâk (post) from Calcutta to Benares, a distance of 428 miles, will incur an expense of one shilling per mile besides buckshees (presents) to the bearers about one shilling per stage, making in all about £25 for the journey, which he will be five days in accomplishing, (exclusive of halts). If by Palkee with eight bearers, going 15 miles, per diem he will have to pay £12 10*s.* besides £2 10*s.* for a banghy,* and will consume nearly a month on the road. This mode of travelling, besides the loss of time, is attended with danger from robbers. The journey is ac-

* A banghy wallah, or bearer of two light boxes.

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complished in sixteen days on horseback. By water, by bugderow from £15 to £25—and forty days are occupied on the journey, if going up the river.

By Steamer, the fare will be much the same as above, and the time occupied may be about ten days, for three months in the year, and nearly twenty, for the remaining nine months.

By Gharry, (native carriage drawn by oxen), will cost £10, and travel at the rate of twelve miles per diem.

Infantry regiments move at the rate of ten and a half miles per diem, halting six days in the month, so that it takes about six weeks to move, from Calcutta to Benares, a single corps.

The cost then of a detachment of 300 men, proceeding by water to Allahabad, would be as follows,

Boat allowance to one Field Officer (say a Major) for two and a half months at 360 Rupees	Rs. 900
Boat allowance to three Captains for two and a half months at 180 Rs.	1350
Boat allowance, 10 Subaltern at 100 Rs.	2,500
Ditto. ditto. 1 Surgeon at 180 Rs.	450
Twenty-five, 600 maund boats for men	3,375
	Rs. 8,575

And if to this is added, the boats for accommodation of the sick, row boats and store boats, the amount will be considerably increased, without

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taking into consideration the extra establishments proceeding with such a detachment, whereas the cost of conveying such a detachment by the railway, at a penny a head per mile, for 600 miles, would only be £750 or 7,500 rupees.

The cost of extra establishments with European troops marching, I cannot so accurately state, but it will be found, I think, to exceed the cost at which they could be transported by railway."*

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* Report on the application of Railway Communication in India, published in the Calcutta papers in March 1843, by Capillestern.

Note to 3rd. Edition. Since the completion of the Grand Trunk Road from Calcutta to Meerut, a light Palanquin carriage, capable of conveying one or two persons, is occasionally substituted for the old Palanquin. Lord Ellenborough when Governor-General was the first who used a carriage of the above description. At every stage of ten miles, relays of twelve men are placed, eight of these are attached in front, and the remaining four, push the carriage from behind.

Whether from the novelty of this mode of transit, or from the ease, with which a light conveyance is propelled along a good and level road, or from both these reasons, it is very popular with the men (the bearers) who are employed, and they keep up an average speed of five miles per hour, without any apparent distress.

The carriage has to be bought at Calcutta, and costs £50 but it is readily resold at the end of the journey. The payment to the men is much the same, as that to bearers in the old system, but in the carriage, two persons may be accommodated instead of one as in the Palanquin.

From Allahabad to Meerut, there is a sort of stage-carriage, of the above description in connection with the Post-office Department drawn by a single Tattoo (Pony) for the conveyance of passengers. Each pony goes a stage of five miles,

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Small parties or individuals marching or proceeding by water move at a quicker rate.* (vide p. xxii).

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and the rate of travelling is from 8 to 10 miles per hour, but this speed is not to be depended on, as the ponies occasionally become refractory. The expense is about the same as the usual mode of travelling by Dâk.

* *Note to Third Edition.*—FROM the badness, or the entire want, of roads and the absence of bridges across the rivers and nullahs, the rate of travelling of the loaded camels, bullocks and waggons is frequently reduced to one mile per hour; so that a laborious and painful day's journey is getting over, or rather *through* 10 miles of country with perhaps several hundred in the same predicament in prospective.

It is apparent that this state of things must damage cotton, and other merchandise and too often lead to their destruction (especially the cotton) as marketable goods or commodities.

The cattle also occasionally sink from want of fodder, or water; but more frequently drop under their burdens from the heaviness of the road. Thus entailing a double hardship on the merchant as he frequently is unable to supply their loss. The fair and benevolent members of the Ladies' Society for the prevention of cruelty to animals, would have an ample field for their sympathies in India for nowhere do the brute creation suffer more grievously and nowhere more patiently.

This torpidity of movement is almost universal—the writer has seen the Regiment, to which he belonged, when marching in the centre of our territories, consume a day in crossing a river with its baggage; and when there has been no river to cross, not even a nullah of large dimensions, he has seen the officer of the rear-guard rejoin head-quarters late at night, after a march of only 12 or 14 miles, from the baggage-waggons sticking in the mud! Well might the old Romans style the baggage of their Armies—IMPEDIMENTA!

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(G.)

Total traffic on Jumna downwards, taken at Allahabad Bridge of boats during 25 days of April 1841.

36,024	Bags of salt	at	12	Bags per Ton.	3,002.		
52,080	Bales of cotton	"	8	do. "	6,510.		
828	Bags of saltpetre	"	12	do. "	69.	Tons.	
2000	Hides	"	50	do. "	40.		
	Add for 5 days				1,924.	11,545,	

Jumna traffic upwards.

13,119	Bags of rice	at	12	Bags per Ton.	1,193.		
2,240	Do. cocoa nuts	"	12	do. "	170.		
2,347	Spices	"	12	do. "	195.		
2,815	Miscellaneous	"	12	do. "	234.		
	Add for 5 days				358.	2,150.	13,695.

Total traffic on Ganges downwards, as taken at Allahabad Bridge of boats, in April 1841.

54,700	Pieces of Kurwah cloth	at	500	pieces per Ton.	109.		
1,004	Bags of mustard	"	12	"	84.		
6,305	Do. Saltpetre	"	12	"	525.		
7,162	Bales of cotton	"	8	"	895.		
12,250	Hides	"	120	"	102.		
4,450	Miscellaneous	"	12	"	371.		
13,700	Horns	"	120	"	114.	2,200.	
						Carried over 15,895 tons.	

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(G continued.)

Ganges traffic upwards.

				Brought forward	15,895 tons.
1,348	Wine chests	at 12	per ton	112.	
1,013	Bags of cocoa nuts	" 12	"	84.	
7,394	Do. " rice	" 12	"	616.	
4,189	Do. " spice	" 12	"	349.	
4,940	Iron and tin	" 10	"	494.	1,655
In addition to this 94 boats containing passengers and goods, not counted, and may be estimated at 40 tons each.					3,760.
Total amount of traffic on Ganges and Jumna in April 1841.					21,310.

Statement of the amount of traffic along the Grand Trunk Road as kept at Futtehpore, under the superintendence of Conductor Tuceffe, during the month of April 1841.

Futtehpore. 1st. May 1841.

	Hackeries.*	Bhilies.†	Camels.	Elephants.	Bullocks.	Tattoos.‡	Mules.	Horses	Buggies.	Carriages.	Palanquins.
West.	636	407	64	23	106	162	54	19	8	2	48
East.	441	428	159	21	189	133	7	19	5	3	55
Day.	1,077	835	223	44	295	295	61	38	13	5	103
Night.	419	113	197	6	50	33		72	19		58
Total	1,496	948	420	50	345	328	61	110	32	5	161

* Native carts. † Native carriages. ‡ Ponies

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(G. i.)

STATEMENT OF THE TRAFFIC

BETWEEN

CALCUTTA AND DELHI,

FROM

OFFICIALLY AUTHENTICATED GOVERNMENT RETURNS.*

Goods Traffic between Calcatta and Mirzapore. Ganges Traffic (Goods).

In the year 1844-5, it appears, from the official statement of the collector of tolls at Jungypore, on the Bhagarutty River, that boats passed through that branch of the river, containing 21,497,750 maunds; or, taking 27 maunds to the ton, the tonnage of the laden cargo boats was	796,213 tons:
To catch the vessels coming through the rivers of the Sunderbunds, a toll is imposed on the vessels navigating Tolly's Nullah, and the circular Canal at Calcutta. The toll is half a rupee for every hundred maunds of tonnage (boats of less than a hundred maunds not being counted), and in 1844-5 it yielded 177,791 rupees; showing that 35,558,200 maunds of tonnage had passed through it, which, at the rate of 27 maunds to the ton, gives.....per annum.....	1,316,970 "
Traffic in native boats is therefore	2,113,183 tons.

---

* *Vide*—1*st. Report of Directors East Indian Rail. Compy.*

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Brought forward	2,113,183 tons.
In 1844 5, seven steamers made 39 trips upwards, and carried 112,765 measurement feet, and 1,156,909 lbs. weight of cargo. Reckoning a cubit foot to weigh 30 lbs., we have, carried UPWARDS by steamers	2,027 "
The number of DOWNWARD trips, and goods carried, cannot be precisely ascertained; but the number of downward trips must have been about the same as the number of upward trips; and, from the return of *several* downward trips which *are* ascertained, the proportion of goods carried downwards would appear to be about one third of the goods carried upwards. We therefore have, carried downwards, of measurement goods 37,588 feet, and 385,636 lbs. weight of cargo, or	675 "
Total of Goods carried on the Ganges ...	2,115,885 tons.

TRAFFIC ON THE MIRZAPORE ROAD, AND DAMOODA RIVER.

BETWEEN Calcutta and Burdwan 2,000,000 maunds of coals are carried .....say	74,074 tons.
On the road leading through Burdwan, the yearly traffic is 7,360 hackeries, and 3650 laden bullocks. A hackery load is twelve maunds; but as the whole number of hackeries would not probably be fully laden, we may take the load. at 10 maunds each, which gives 73,600 maunds as the weight carried .....say	2,726 "
Twelve bullocks will carry about a ton; there are, therefore, annually carried by bullocks	304 "
Carried over	77,104 tons.

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Brought forward		77,104 tons.
Besides this, we have carried along the road—		
Of Sugar and Goor...maunds	500,000.	
Salt	350,000.	
Cotton	1,000.	
Rice	50,000.	
	901,000, or	33,370 "
Making a total of goods carried along Mirzapore Road and Damooda River ...		110,474 tons.

RECAPITULATION.

Traffic by native boats	2,113,183 tons.
Ditto in steamers	2,702 "
Ditto along the Road	110,474 "
Total tonnage	2,226,359 tons.

PASSENGER TRAFFIC BETWEEN CACUTTA AND MIRZAPORE.

By native boats . .	about	60,000 passengers	per annum.
" Steamers		2,000 "	"
" Passengers passing over the Annabad Bridge in various conveyances, and on foot	about	508,000 "	"
	Total	570,000 "	per annum.

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GOODS TRAFFIC BETWEEN MIRZAPORE AND DELHI.

In the returns obtained, the goods traffic is variously stated, at 1,051,881 tons; 1,017,500 tons; and 900,000 tons; consisting of salt, sugar, cotton, and general merchandize.

PASSENGER TRAFFIC BETWEEN MIRZAPORE AND DELHI.

By Carriages . .	about	56,804	passengers per annum.
" Palkees		1,959	" "
" Dhoolies		1,437	" "
" Elephants		1,323	" "
" Camels		668	" "
" Horses		38,916	" "
" On foot		334,744	" "
	Total	446,851	" "

[The average speed and cost of conveyance is given in the following page.]

Note—The value and tonnage of imports and exports of Calcutta by sea for 1844-5—18,024,420*l*—and . . . . . 531,262 tons.
(Vide Calcutta Review No. 14.)
Showing an increase in imports and exports over the previous year—in value—3,305,205*l*—in tonnage . . . . . 4,989 tons.
(Vide Appendix H.)

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(G. ii.)

AVERAGE SPEED AND COST OF THE PRESENT MODES OF CONVEYING PASSENGERS AND GOODS IN BENGAL AND N. W. PROVINCES.

(One person).	Time.	Distance.	Fare.	
By Dâk (post)	in 24 hours.	60 miles	1*s.* 0*d.*	per mile.
" Palkee (Vide p. xii.)		15 "	8*d.*	"
" Gharry * (native carriage)		12 "	5*d.*	"
" Steamer	" "	50 "	1*s.* 6*d.*	"
" Budgerow †	" "	20 "	2*s.* to 6*d.*	"
" River boats ‡	" "	25 "	½.	"
" Horse	" "	15 "	1⅛*d.*	"
" Hackery with goods	"	10 "	1¾*d.*	"

Goods per mile (very nearly.)

By steamers,‖	By river boats.§	By land.¶
2½*d.* per ton.	1¾*d.* per ton.	4*d.* per ton.

* Can accommodate 3 or 4 travellers.

† Is hired for the trip—and if large—can accommodate a family of five persons.

‡ If there are eight passengers the charge for each will be as above—only natives whose means are very moderate travel in this way, the wealthy native trader pays a much higher fare.

‖ A higher rate is charged for short distances:

§ The speed of the cargo boats is much less than that of those which convey passengers.

¶ This is by the common cart of the country—by pack-bullocks, camels, and ponies it is more expensive.

Travelling by land in Madras and Bombay is much the same as in Bengal—they have no navigable rivers.

The Madas rate for Government stores by cart, is 5½d. per ton per mile.

In Bombay the rate is very fluctuating but the average may be taken at 5d. per ton per mile for the conveyance of cotton from the interior to the port of Bombay—pack bullocks are generally used from the want of roads in this presidency.

Vide *paras.* 77, 78, *& 79 of the Report of the Government Commission on the cultivation of cotton in India.*

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(I.)

Table of the quantity and value of tropical productions imported into England.

"Statement made by Mr. Mongtomery Martin, in the Court of the East India Proprietors, as to the Quantity and Value of Articles Imported into England, the whole of which may be obtained from British India.

1.	Sugar, 4,500,000 cwts., at 20*s.* per cwt.	£4,500,000.
2.	Molasses, 500,000 cwts., at 10*s.* per cwt.	250,000.
3.	Rum, 5,000,000 gallons, at 1*s.* per gallon	250,000.
4.	Coffee, 40,000,000 lbs., at 6*d.* per lb.	1,000,000.
5.	Tea, 40,000,000 lbs., at 1*s.* per lb.	2,000,000.
6.	Cocoa, 3,000,000 lbs., at 6*d.* per lb.	75,000.
7.	Tobacco, 50,000,000 lbs., at 6*d.* per lb.	1,250,000.
8.	Cotton, 400,000,000 lbs., at 6*d.* per lb.	10,000,000.
9.	Indigo, 7,000,000 lbs., at 3*s.* 6*d.* per lb.	1,225,000.
10.	Saltpetre, 300,000 cwts., at 20*s.* per cwt.	300,000.
11.	Rice, 300,000 cwts., at 10*s.* per cwt.	150,000.
12.	Pepper, 7,000,000 lbs., at 4*d.* per lb.	125,000.
13.	Cinnamon and Cassia, 1,500,000 lb., at 6*s.* per lb.	450,000.
14.	Ginger, 25,000 cwts., at 20*s.* per cwt.	25,000.
15.	Spices (general), official value	250,000.
16.	Cochineal, 600,000 lb., at 5*s.* per lb.	150,000.
17.	Wool, 60,000,000 lbs., at 1*s.* per lb.	3,000,000.
18.	Hemp and Flax, 2,000,000 cwts., at 20*s.* per cwt.	2,000,000.
	Carried over	£27,000,000.

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	Brought forward	£27,000,000.
19.	Vegetable Oils, 6,000,000 gallons, at 1*s.* per gallon	300,000.
20.	Hides, 400,000 cwts., at 36*s.* per cwt.	720,000.
21.	Skins untanned or dressed, number, 4,000,000, at 6*d.* each	100,000.
22.	Linseed, 3,500,000 bushels, at 30*s.* per quarter	600,000.
23.	Tallow, 1,000,000 cwts., at 20*s.* per cwt.	1,000,000.
24.	Dye Woods, &c., official value .	500,000.
25.	Drugs and Gums, ditto . . .	500,000.
26.	Sundries	1,000,000.
	Total	£31,720,000.

"There is scarcely one important article of tropical produce, which is consumed in this country, either as the raw material of our manufactures, or as an article of daily use for the production of which India is not as well, or better adapted than any other country; while its dense and industrious population would seem to offer an illimitable demand for our manufactures. Nor are there opposed to these natural and flattering elements of commerce any fiscal restrictions to counteract their beneficial results."

The Economist Aug. 28, 1847.

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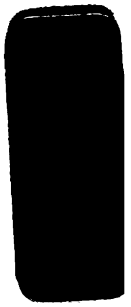

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