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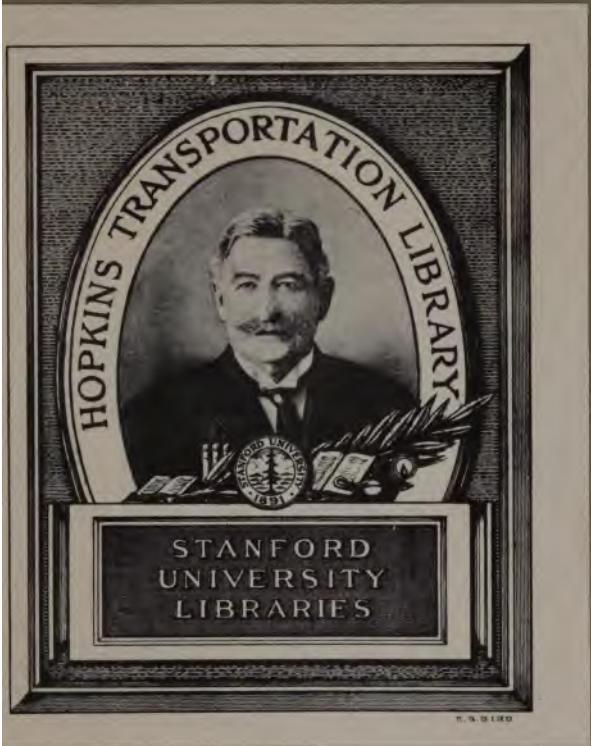
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To

THE PROPOSED
ENGLAND AND INDIA
RAILWAY.

A LETTER

TO

THE RIGHT HON. W. E. GLADSTONE, M.P.

FIRST LORD OF THE TREASURY.

BY

WILLIAM LOW AND GEORGE THOMAS,

CIVIL ENGINEERS, WYKEHAM AND CARDIFF.

LONDON:

SAVILL, EDWARDS & CO., PRINTERS, CHANDOS STREET,
COVENT GARDEN.

1871.

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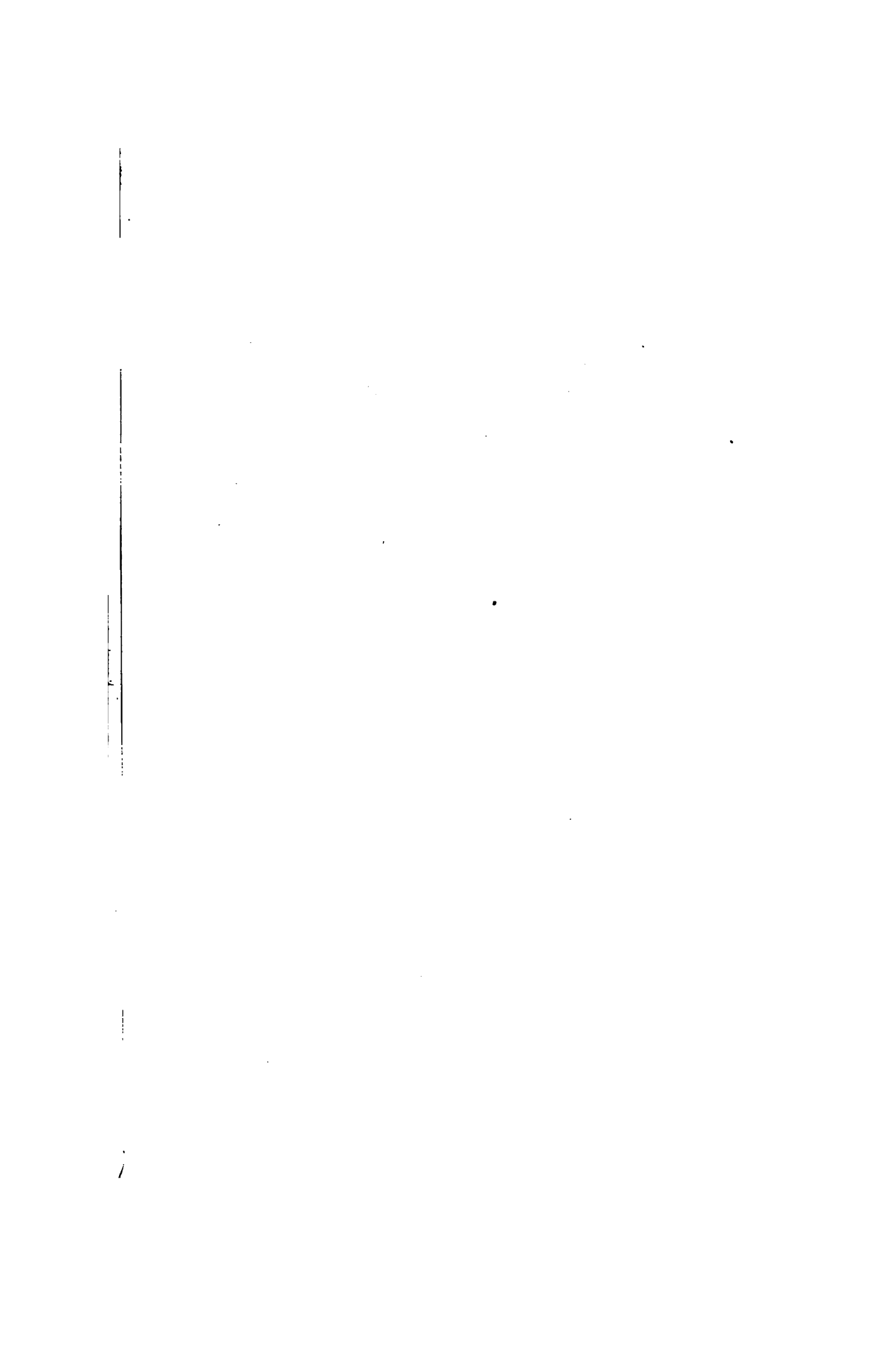
THE
MOUNTAIN STATE
NEW JERSEY

THE
MOUNTAIN STATE
NEW JERSEY



With the Engineers' Compts.

THE PROPOSED
ENGLAND AND INDIA
RAILWAY.



PREVIOUSLY to submitting this letter, addressed to the Right Honourable W. E. Gladstone, M.P., containing a description of our proposed route to India, we thought it right to strengthen our own judgment by laying the whole scheme before James Brunlees, Esq., C.E., Member of the Council of the Institute of Civil Engineers, who, after a careful examination, forwarded to us his opinion in the following letter :—

“ To Messrs. Low and THOMAS.

“ 5, Victoria Street, Westminster,

“ 21st July, 1871.

“ DEAR SIRs,

“ I have examined with much interest the plans of your project for establishing through railway communication between this country and India, and I am of opinion that in the main you have selected the route which presents the fewest physical difficulties, and that your estimates of the cost of construction appear to be sufficient. I am not so capable of judging of the merits of your scheme from a political point of view, but the fact of your proposed line being accessible from the Mediterranean at so many points seems to me to give it a preference over any more inland route.

I am, dear Sirs, yours truly,

JAMES BRUNLEES.

The Proposed England and India Railway.

*To the Right Honourable W. E. GLADSTONE,
First Lord of the Treasury.*

SIR,

THE construction of an unbroken line of railway connecting the railway system of England with that of India, and at the same time uniting the principal States of Europe and Asia, is an undertaking of such importance that if carried out it would tend more to the benefit of mankind than any work that has been accomplished for centuries past.

The idea of such a work is by some persons considered Utopian, others however will say, it may be accomplished in the distant future, and whilst few have the remotest idea of what immense benefit such a work would be, fewer still are at all aware how easily this important undertaking can be carried out, at what a comparatively trifling cost, and in what a short space of time.

We believe that the time is not far off, when a passenger may leave England, and travelling with comfort and ease, may arrive in India a few hours after the fifth day of his departure from London, and that this shall not be a monthly, fortnightly, or even weekly occurrence, but twice daily throughout the year.

Provided this work can be done at a reasonable cost, then all will admit that the incalculable benefits it would confer, by

bringing together in close bonds of union so many nations, by developing the commerce of each separately and collectively, and by improving all socially, morally, and politically, cannot even be imagined, much less described.

The political importance and commercial advantages of bringing India into still closer proximity with this country, than even has been done by the opening of that great work—the Suez Canal—must be better known to you than ourselves. Our object as engineers, is to lay before you as briefly and as clearly as we can, the project of a line of railway which we consider should be made, and which England should take an active part in seeing executed, because it would bring India practically within five days' journey of the commercial centres of this country.

In entering upon the subject of a direct, continuous, and unbroken line of railway, between England and India, we do not pretend to assert that the idea of direct railway communication between this country and India is new, for such a scheme has been mooted several times, and portions of the line we are about to lay before you as a whole, have had several projectors.

The portion we particularly lay claim to as being new, is the extension of the line through Dalmatia, and through Turkey in Europe, as well as that portion of the line in Asia Minor, between Constantinople and Tarsus *via* Adalia. In reference to other portions of the line, we have adopted routes partially described and laid down by other projectors. The coast line along the Persian Gulf, and in Persia, also along the coast of Beloochistan, is pointed out by nature, as forming part of the direct railway between Europe and India. Thus with the railways already opened in England, France, Italy, and Austria, we propose to have one united scheme, one continuous railway, one company, with one rolling stock to work through between England and India.

That the English government has not been indifferent to the vast importance of uniting more closely this country with the 175 millions of people in India with whom we are so intimately connected both politically and commercially, is proved



To

by the steps that have been taken in past years to ascertain the best means of improving our communication with that country. In the years 1835, 1836, and 1837, General Francis Rawden Chesney was instructed by the government to survey the Euphrates valley, the object being to obtain an overland route between England and India, in contradistinction to the Ocean route *via* the Cape of Good Hope. The cost of this survey, undertaken by order, and paid for by vote of the House of Commons, amounted to upwards of 40,000*l*.

When the work was commenced, it was not expected that anything like so large a sum would have been required, but great and unforeseen difficulties occurred at the outset of the undertaking, such as the conveyance of the hulls of two small steamers, with the boilers and machinery from the Mediterranean Sea to the River Euphrates, and these difficulties were greatly aggravated by the obstacles not anticipated, thrown in the way of the expedition by the vacillating conduct of the Turkish government of that day. All these obstacles and difficulties were, however, overcome by the perseverance and energy of General Chesney and the officers under him, and although the object of that survey has not yet been attained, so far as having steam communication in the Persian Gulf, and on the Euphrates River, yet the fact has been proved that the Euphrates is navigable for small steamers to within 150 miles of the Mediterranean, and anyone who has carefully studied the interesting narrative of that survey by General Chesney, must allow that the money laid out by the Government has been well spent, and bears fruit even at the present day.

At the same time, whilst the River Euphrates has been proved to be navigable for small steamers, we do not think it is navigable for the class of steamers at present necessary for the great stream of traffic between Europe and India, daily increasing with every improvement taking place by the extension of railways both in India and Europe.

Railways have in an especial manner given an impetus to manufactures and commerce generally, besides increasing and developing the internal resources of every country where

they have been formed. Therefore, although the Euphrates River is of itself perfectly incapable of being made the highway for the traffic to and from the East, when a railway shall have been made along that valley, not merely for taking the local traffic, but a line forming a link of a great continuous railway between the nations of Europe and of the East, the stream of traffic will thereby be developed to an extent that may be fairly judged from the existing ruins of the grandeur of former times.

Although the object of General Chesney's survey and the exertions which he has made up to the present time—viz., that of a Steam Navigation route *via* the Mediterranean and the Persian Gulf, thereby attaining a nearly direct route to India by steam navigation and railway combined—has not yet been attained, we believe the result might have been different had he exerted his energies upon the accomplishment of one continuous line of railway. When, however, the survey was commenced, the power of the locomotive was comparatively unknown, and the extension it has attained not even dreamed of. Even at the present day, with the experience of the past thirty years before us, how few there are who can contemplate the practicability of a direct and continuous line of railway, that shall unite not only the Railway system of England with that of India, but every town of importance in Europe and Asia.

The opening of the Suez Canal, through the perseverance and energy of M. Lesseps, will be of immense benefit to the commerce of England. It has already given a fresh stimulus to our steam shipping, and has given one unbroken line of water communication between England and the East, and with less than one-half the distance of the old route *via* the Cape of Good Hope. We shall be able to show you that the time occupied in the conveyance of mails, passengers, and goods by our proposed line of railway will amount to nearly one-fifth of the time at present actually taken by the improved Red Sea route.

In place of a mixed transit of land and water requiring several changes from locomotive to steam boat and from steam

boat to locomotive, from a broken railway transit of 1700 miles, and a broken steam boat transit of about 4600 miles, there will be one unbroken line of railway of 5339 miles from London to Kurrachee, passing through France, Italy, Austria, Turkey in Europe and Asia, Persia, and Beloochistan, without change of conveyance, in carriages built specially for the purpose of ensuring to the passenger the most perfect comfort and convenience, protecting him from all the sudden changes produced by the rapid transit through the different countries, so that with nearly as much comfort as in one's own house the journey may be accomplished from the banks of the Thames to those of the Indus in about five days; and what can be accomplished for mails, passengers, and goods can be made available for an army if required.

To accomplish this work satisfactorily it will be necessary that the different nations through which the line must pass should give every facility for the proper working of the through trains, and to obtain this they should enter into a fair and honourable treaty with each other, and in order to facilitate the accomplishment of this object, we have prepared detailed plans and estimates of the proposed new line as it passes through each of the respective countries, a copy of each of these plans, as well as one showing the route of the whole line accompanies this letter. A copy of this letter, containing the General Plan No. 1, showing the whole line, and one detailed plan, will be sent to each of the representatives of the countries specially interested in the promotion of the undertaking. This is done in the hope of bringing the whole scheme in its entirety before each of the Governments of the countries through which the line is proposed to pass, and who will therefore be particularly interested in its construction and maintenance.

Previous to describing in detail the route which we recommend for your consideration, it may be advisable to bring before you the different means we have at present of communication with India, stating the distance and time occupied both by railway and sea of each respective route. You will thereby be the better able to judge of the importance and

advantages of the line which we have the honour to bring under your notice.

In making a comparison of distances, it will be necessary to compare all from the same point of departure and arrival; we will therefore take London as the point of departure from England, and Kurrachee and Bombay as the points of landing in India.

Bombay, in the arc of a great circle, is 4471 English statute miles distant from London; its situation is very central on the west coast of India, having lines of railway branching therefrom, and extending right across India. One *via* Allahabad to Calcutta, and from thence to Delhi and Meerut, and on to Moulton, situate on the River Chenaub, one of the principal tributaries of the Indus; another line of railway crosses India in a south-easterly direction to Madras, and another running north *via* Baroda and Hyderabad to Kurrachee.

Kurrachee is the most northerly seaport in India, the principal harbour, and, next to Hyderabad, the most important town in Scinde. A railway beginning at Kurrachee has been opened for 105 miles in length, ending at Kotree on the Indus, opposite to Hyderabad, and forming part of the line to Bombay *via* Baroda. From Kotree the line will at no distant time be continued to Moulton, forming direct communication *via* Lahore and Delhi with Calcutta. A line of railway will also undoubtedly be extended up the Indus valley to Attock joining the proposed line from Caboul to Lahore. The line from Kurrachee up the Indus valley to Attock will become both commercially and politically the most important line in India.

Bombay is the nearest principal port to England *via* the Cape of Good Hope, but Kurrachee is the nearest port to England *via* the Red Sea and Persian Gulf routes. Kurrachee, in the arc of a great circle, is distant from London 3920 statute miles, being 550 miles nearer than Bombay to London. Being the port for the whole trade of the River Indus, and likewise at the entrance into India for all future direct railway communication connecting the railway system of Europe with that of India, it must eventually become a town of the greatest importance. We cannot help here quoting in reference thereto

the words of Sir Charles Napier, the conqueror of Scinde :—
 “ Kurrachee, you will yet be the glory of the East ; would that I could come alive again and see you in your grandeur.”

Having thus given our reasons for fixing upon Kurrachee and Bombay as the points of arrival and departure from India, we proceed to make a comparison of our present means of communication between England and India with what it will be when we shall have one unbroken iron highway connecting the capital of England with that of the capitals of the three Presidencies of India, and in fact linking together in an iron and steel bond of union and friendship all the capitals of Europe and Asia.

Plan No. 1 shows all the existing routes, *via* the Red Sea, to India ; also the proposed England and India Railway, which we project, and which, so far as it has to be constructed, will be elucidated by enlarged plans showing in detail the line as it passes through each respective country. The route from England *via* the Cape of Good Hope is not shown, as we consider this route, so far as all quick transit is concerned, to be virtually abandoned, the sea route *via* the Suez Canal being less than one half of that *via* the Cape of Good Hope.

The first route to which we beg to direct your attention, and which we will call the English route, is shown on Plan No. 1 in a solid black line for railway completed, and a dotted black line for sea route ; the whole is coloured with a dark blue shade. From London to Southampton by rail, and from Southampton to Bombay or Kurrachee by sea *via* Gibraltar, Malta, Alexandria, Suez Canal, the Red Sea, to Aden, and thence to Bombay or Kurrachee, the distance being as follows :—

| | Miles. | |
|--|-------------|-------------------|
| London to Southampton . . . | 79 | Rail, locomotive. |
| Southampton to Bombay “ as above” | 7102 | Sea, steamship. |
| London to Bombay . . . | <u>7181</u> | miles. |

As the distance from Aden (at the entrance to the Red Sea)

to Kurrachee is 180 miles less than it is to Bombay, the distance from London to Kurrachee will be as follows:—

| | Miles. | |
|--------------------------------|--------|-------------------|
| London to Southampton . . . | 79 | Rail, locomotive. |
| Southampton to Kurrachee . . . | 6922 | Sea, steamship. |
| | <hr/> | |
| London to Kurrachee . . . | 7001 | miles. |

Second or French route : From London, *via* Dover, Calais, Paris, Marseilles, Alexandria, Cairo, Suez, Aden to Bombay or Kurrachee.

The first we named the English route on account of its being a sea route the whole way, although it has to pass through a part of Egypt, so far as the Suez Canal is concerned, but that canal is open to the shipping of the whole world. We have named this second the French route as it passes through nearly the centre of France from its most northern boundary at Calais to nearly its most southern boundary at Marseilles. The distances are as follows:—

London to Bombay.

| | Miles. | |
|---|--------|------------------------------|
| London to Dover | 78 | Rail, locomotive. |
| Dover to Calais | 28 | Channel, steamship. |
| Calais to Marseilles, " <i>via</i> Paris" | 721 | Rail, locomotive. |
| Marseilles to Alexandria . . . | 1625 | Sea, steamship. |
| Alexandria to Suez | 252 | Rail, locomotive. |
| Suez to Bombay | 3422 | Sea, steamship. |
| | <hr/> | |
| | 6126 | miles <i>via</i> Marseilles. |

London to Kurrachee.

| | Miles. | |
|--|--------|------------------------------|
| London to Suez " <i>as above</i> " . . . | 2704 | Rail and steamship. |
| Suez to Kurrachee | 3242 | Sea, steamship. |
| | <hr/> | |
| | 5946 | miles <i>via</i> Marseilles. |

In this route we have given the distance by rail between Alexandria and Suez, it being the shortest in point of time. The distance by sea is nearly the same. The sea route *via* the Canal has the advantage of not requiring any change in transit either at Alexandria or Suez, which travelling partly by rail necessitates.

Third, or Italian Route.

London to Bombay or Kurrachee *via* Dover, Calais, Paris, the Mont Cenis Tunnel, Brindisi, Alexandria, Suez, and Aden. At the time of writing this the Mont Cenis Tunnel is not quite complete enough for a locomotive to pass through, but the tunnel itself may be considered an accomplished fact, the engineers having overcome all the difficulties in this very expensive work. There is but one more obstacle to the working of the traffic—viz., the ventilation of the tunnel in such a manner as to insure comfort to the passengers, and safety from suffocation to the engine-drivers. This will doubtless be easily accomplished by the engineers.

London to Bombay.

| | Miles. | |
|--------------------------------|--------|-------------------|
| London to Dover | 78 | Rail, locomotive. |
| Dover to Calais | 28 | Sea, steamship. |
| Calais to Brindisi | 1391 | Rail, locomotive. |
| Brindisi to Alexandria | 1074 | Sea, steamship. |
| Alexandria to Suez | 252 | Rail, locomotive. |
| Suez to Bombay | 3422 | Sea, steamship. |

6245 miles *via* Brindisi.

London to Kurrachee.

| | Miles. | |
|------------------------------------|--------|---------------------|
| London to Suez "as before" | 2823 | Rail and steamship. |
| Suez to Kurrachee | 3242 | Sea. |

6065 *via* Brindisi.

The Italian or Brindisi route, although longer by 119 miles than the French route, is the shortest in point of time. On the Brindisi route the journey by rail is 670 miles longer than the journey by rail on the French or Marseilles route; and the journey by sea *via* Brindisi is 551 miles shorter than *via* Marseilles. The difference in speed in travelling by locomotive *versus* steamship may be said to be about 4 to 1, or taking the locomotive at 40 miles per hour, and the steamship at 10 miles per hour, we have 55 hours for travelling the extra sea distance from Marseilles, and 17 hours for travelling the extra rail distance to Brindisi. We have thus a saving of $55-17=38$ hours in favour of Brindisi *versus* Marseilles.

Fourth, or Austrian Route.

London to Bombay or Kurrachee *via* Dover, Calais, Paris, Mont Cenis Tunnel, Trieste, Alexandria, Suez, and Aden.

London to Bombay.

| | Miles. | |
|---------------------------------|--------|-------------------|
| London to Dover | 78 | Rail, locomotive. |
| Dover to Calais | 28 | Sea, steamship. |
| Calais to Trieste | 1064 | Rail, locomotive. |
| Trieste to Alexandria | 1393 | Sea, steamship. |
| Alexandria to Suez | 252 | Rail, locomotive. |
| Suez to Bombay | 3422 | Sea, steamship. |

6237 *via* Trieste.

London to Kurrachee.

| | Miles. | |
|-----------------------------------|--------|-----------------|
| London to Suez as above | 2815 | Rail and sea. |
| Suez to Kurrachee | 3242 | Sea, steamship. |

6057 *via* Trieste.

Fifth, or Euphrates Valley Route.

This is the route so long and ably advocated by W. P. Andrew, Esq., the Chairman of the Scinde Railway Company, and is a proposed sea and land route similar to the present routes *via* Alexandria and Suez. Mr. Andrew's route cannot in any way be compared with the continuous sea route *vid* the Suez Canal; this great work of M. Lesseps can never be superseded by the substitution of a shorter continuous sea way, for a shorter continuous sea way than that by the Suez Canal can never be made; physical difficulties render any shorter sea route impossible. But as a sea and rail route, that suggested by Mr. Andrew is the shortest, going *via* Marseilles, Trieste, or Brindisi to India. There is, however, this disadvantage, viz. :—There are now harbours and dry docks for receiving and repairing the shipping, both in the Mediterranean and in the Red Sea, constructed at a great expense. There is now, also, a regular established steam-packet service from nearly every European port to Alexandria, and through the Suez Canal to India, and the daily increasing traffic through the canal will always command such facilities for adding to the ease of navigating the Red Sea that it will discourage the attempt of trying to obtain a regular steam-packet service on the Persian Gulf for many years to come.

Had the attention, energy, and perseverance of Mr. Andrew been given to show that the Euphrates Valley line forms a portion of a direct and continuous line of railway between Europe and India, instead of a line having a steam-packet service at each end, the work might have been in a more forward state than it is at present. His energy has, however, been directed to a line of steamship communication between one of the European ports and Selucia, a proposed port in the Mediterranean, and from thence a railway to the Euphrates River, then to navigate the Euphrates with small steamers to Bussorah, and from thence by a regular line of steamers to Kurrachee and Bombay, thus carrying out the great idea of General Chesney. If this route had obtained the support of England, and been opened up previous to the Red Sea route,

it would undoubtedly have given us better and speedier communication both for passengers and mails to India than we have at the present time.

Mr. Andrew has, however, abandoned this idea, and substitutes for the navigation of the Euphrates a line of railway from the port of Seleucia to Bussorah ; the distance by this route is as follows :—

London to Kurrachee or Bombay.

| | Miles. | |
|----------------------------|--------|-------------------|
| London to Dover . . . | 78 | Rail, locomotive. |
| Dover to Calais . . . | 28 | Sea, steamship. |
| Calais to Brindisi . . . | 1391 | Rail, locomotive. |
| Brindisi to Seleucia . . . | 1234 | Sea, steamship. |
| Seleucia to Bussorah . . . | 900 | Rail, locomotive. |
| Bussorah to Kurrachee . | 1375 | Sea, steamship. |

London to Kurrachee . 5006 miles.

Kurrachee to Bombay . 580 „

5586 *via* Seleucia.

Sixth : The England and India projected Continuous Railway Route.

This is shown upon Plan No. 1 by a solid black line, with a dark red shade to denote the portion of railway already made, and by a solid red line with a dark red shade to denote the portion of railway to be constructed so as to form one unbroken and continuous line of railway from England to India.

Having described the four principal existing routes to India, with that proposed by Mr. Andrew, all of which are generally termed overland routes, in contradistinction to the ocean route *via* the Cape of Good Hope, we now proceed to give a description of the projected sixth route, which will be in reality, and not in name only, an overland route, and we respectfully call to it the attention of the leading statesmen, not only of England,

but also of the different countries through which the line will pass, who are all so much interested in its construction ; and we may here point out that it will practically unite more countries even than those it passes through. For example, to the west of the line it will be in direct connexion with the capitals and railway systems of Portugal and Spain, and to the east of the line with those of Belgium, Holland, Switzerland, United Germany, and Russia.

Taking, like the other routes, London as our starting point, the line runs *via* Dover, Calais, Paris, Macon, Mont Cenis Tunnel, Turin, Milan, and Trieste, to which place the line of railway is already complete, with the single exception of the Channel crossing between Dover and Calais.

Leaving Trieste, the line passes through Illyria *via* Fiume; through the western boundary of Croatia *via* Ottocac and Gracac, thence through Dalmatia *via* Knin, east of Dernis, about 15 miles east of Spalatro, to the west of Sign, to the east of Fort Opas *via* Ragusa, and crosses the entrance to Cattaro; leaving the Austrian territory near Lastua, as shown more in detail on Plan No. 2. The total length of new line in Austria to be constructed amounts to 385 miles.

Leaving Austrian territory, the line passes through Turkey in Europe *via* Alessio, Sciak, Durazzo, Kavago, Pekini, Karbonates, to the River Beratina, thence passing up this valley *via* Berat, Kussovita, Dubrin, Dusali, Karidschi Plia, Belishta, Kastoria, Sarigol, Karaferga, Golokia, Salonika, Beshik, Rondino, Orphano, and thence to the Bay of Orphano, skirting along the Mediterranean coast *via* Jenidscheikarasu, Comulsina, Maronia, Megri, Keschan, Migalgara to Rhodosdshig, on the shore of the sea of Marmora, and from thence *via* Turkamenti, Silivri, Bujuk-Tschekmedsche to Constantinople, being a length of new line to construct in Turkey in Europe of 602 miles, and being a total distance from London to Constantinople of 2157 miles, out of which 1170 miles are already made, leaving 987 miles to construct. The whole of this line is shown upon Plan No. 3.

On reaching Constantinople, we propose, in the first instance, to cross the Bosphorus by a railway steam-ferry; the train,

without any locomotive, being placed on board a steamship at Constantinople and taken off at Scutari, similar to the plan of Mr. John Fowler, C.E., for crossing the Straits of Dover; only, whilst the Channel crossing is no less a distance than about 29 miles from Dover to a proposed new harbour in France, the crossing of the Bosphorus would be under one mile; and whilst the Channel crossing involves the construction of two very expensive harbours, nothing of the kind is required in the Bosphorus, or rather at its embouchure into the Sea of Marmora.

After crossing the Bosphorus between Constantinople and Scutari, the line would proceed in Turkey in Asia *via* Pendik, Izmid, and curving round the upper end of the Gulf of Izmid, passes south of Isnik at the western end of Lake Isnik, and thence *via* Vezir-Khan, Bilehjik, Shugut, Kutahiyeh, Altum-Tash, Osman, Afion-Kara-Hissar, Sandukli, Dinair (near which place there will be a branch to join the Smyrna and Aidin Railway), Egerdir, and thence down the Valley of the White River until the line reaches the Mediterranean coast about 15 miles east of Adalia. The line will then proceed along the coast *via* Eski-Adalia, Alaya, Selenti, Kharadran, Anamur, Chelindreh, Selefkeh, Ayash, Kara-Hiser, Tarsus, Adanah, Ayas, and curving along the plane of Issus round the Gulf of Iscanderoon, and passing Alexandretta, Beilan, Bakras, and keeping to the south-east of the Lake of Antioch, crossing the river Orontes to the north of Antioch (near which point a line would branch off to Jerusalem), thence *via* Aleppo until it reaches the River Euphrates near Beles, and then following the right bank of the river until it crosses between Annah and Hit, from thence passing over to the River Tigris a short distance above Bagdad, and following the right bank of the River Tigris it would cross the Schatt-al-Hai Canal near Kut-el-hai, from thence to Kurnah, crossing the River Tigris near this place.

The line then proceeds along the left bank of the Schatt-el-arab, which contains the united waters of the rivers Euphrates and Tigris; passing Bussorah, which is situate on the opposite side of the river, it reaches Mohamrah, in Persian territory.

The length of line in Turkey in Asia extends to 1630 miles, as shown on Plan No. 4.

After entering the Persian territory the line crosses the river Karun between Mohamrah and Sabla, and then for the whole course in Persia it follows the north shore of the Persian Gulf *via* Mashoor, Sirimeh, Bunder-dellim, Ca-hyder, BUSHIRE, Andiaro, Deir, Taurie, Nikhiloo, Girza, Mospa, BUNDER-ABBAS, Terai Jask, the length of line in Persia being 855 miles to construct. This line is shown on Plan No. 5.

Leaving Persian territory the line extends along the coast of Beloochistan *via* Gerishk, Kungoon, Kaleg Rashdee, Purug, Tecz, Choobar, Patkooe, Bucker, Gwutter, Jewnee, Gwadel, Gooruh Passeenoe, Harmara, and Sonmeanee; then curving round Cape Monze the railway enters Scinde. The length of line required to be constructed in Beloochistan extends to 674 miles.

The length of line in Scinde from leaving Beloochistan territory until the junction with the existing railway at Kurrachee would be 23 miles.

We have now shown a direct line of railway from London to Kurrachee with only two breaks, the first in the crossing of the Channel from Dover to Calais, and the second from Constantinople to Scitari.

As regards the first we have treated of this elsewhere, and have shown how easily this work can be accomplished by tunnelling under the Channel, but desirous that this crossing (considered by many to be a myth) should be no obstacle in the way of the carrying out of this line, we have supposed that the Straits of Dover can only be crossed by the steam-packets as at present. This would prevent the railway carriages from going direct from England to India, the through carriages would thus have to start from Calais, and the time occupied in crossing the Channel and shifting luggage will be ample if we allow three hours for it.

As to the crossing of the Bosphorous we allow one hour, for there will be no difficulty in ferrying a train across in that time, and the distance by this route will be as follows:—

London to Kurrachee.

| | Miles. | |
|---------------------------|--------|----------------------------|
| London to Trieste | 1170 | Railway completed. |
| In Austria | 385 | To construct. |
| Turkey in Europe | 602 | ,, |
| Turkey in Asia | 1630 | ,, |
| In Persia | 855 | ,, |
| In Beloochistan | 674 | ,, |
| In Scinde | 23 | ,, |
| <hr/> | | |
| Total | 5339 | <i>via Constantinople.</i> |

We have now examined all the routes to India at present open or proposed *via* the Mediterranean. There are others from the central part of Russia or Germany or through the more central part of Turkey in Europe, terminating either at the Black Sea or Constantinople. We think it sufficient, however, to confine ourselves to those *via* the Mediterranean, as any others terminating at Constantinople would bring an extra stream of traffic and add to the importance of that portion of the proposed England and India Railway lying between Constantinople and Kurrachee.

An abstract of the distances of each of the routes is as follows, distinguishing the portion by rail from that by sea :—

*London to Kurrachee and Bombay by first or English route
via the Suez Canal.*

*From London**To Kurrachee.*

79 Rail.

6922 Sea.

7001 Miles.

To Bombay.

79 Rail.

7102 Sea.

7181 Miles.

*Second, or French Route, via Marseilles.**From London*

| | |
|----------------------|-------------------|
| <i>To Kurrachee.</i> | <i>To Bombay.</i> |
| 1051 Rail. | 1051 Rail. |
| 4895 Sea. | 5075 Sea. |
| <hr/> | <hr/> |
| 5946 Miles. | 6126 Miles. |
| <hr/> | <hr/> |

*Third, or Italian Route, via Brindisi.**From London*

| | |
|----------------------|-------------------|
| <i>To Kurrachee.</i> | <i>To Bombay.</i> |
| 1721 Rail. | 1721 Rail. |
| 4344 Sea. | 4524 Sea. |
| <hr/> | <hr/> |
| 6065 Miles. | 6245 Miles. |
| <hr/> | <hr/> |

*Fourth, or Austrian Route, via Trieste.**From London*

| | |
|----------------------|-------------------|
| <i>To Kurrachee.</i> | <i>To Bombay.</i> |
| 1394 Rail. | 1394 Rail. |
| 4663 Sea. | 4843 Sea. |
| <hr/> | <hr/> |
| 6057 Miles. | 6237 Miles. |
| <hr/> | <hr/> |

*Fifth, or the Euphrates Valley Railway, by W. P. ANDREW, Esq., Chairman of the Scinde Railway.**From London*

| | |
|----------------------|-------------------|
| <i>To Kurrachee.</i> | <i>To Bombay.</i> |
| 2369 Rail. | 2369 Rail. |
| 2637 Sea. | 3217 Sea. |
| <hr/> | <hr/> |
| 5006 Miles. | 5586 Miles. |
| <hr/> | <hr/> |

Sixth, or the England and India Railway, by WILLIAM LOW and GEORGE THOMAS.

From London to Kurrachee.

| |
|-------------|
| 5311 Rail. |
| 28 Sea. |
| ————— |
| 5339 Miles. |
| ————— |

Having thus compared the distances to be travelled over by land and water, we proceed to make a comparison of the time occupied in making the journey, calculating the speed travelled by locomotive at 40 miles per hour and that of the steamship at $10\frac{1}{2}$ miles per hour. It may be said that a steam packet can be driven at a greater speed than $10\frac{1}{2}$ miles an hour, and this is true when dealing only with smooth water, but what is required is the average speed attainable in all varieties of weather at which the ocean steam packets may be said to run.

Again, on a railway, a greater speed than 40 miles per hour is easily obtained; the average rate of travelling of the Irish mail exceeds 40 miles per hour, and we see no reason why a speed of 50 miles an hour should not be obtained on the England and India Railway with perfect safety if the line is managed and the through traffic worked as we suggest hereafter. Therefore, taking the rate of travelling by rail at 40 miles per hour and that by sea at $10\frac{1}{2}$ miles per hour, the time occupied in performing the journey by the different routes will be as follows:—

First, or English Route, via the Suez Canal.

| | Days | Hours | Min. |
|------------------------|------|-------|------|
| To Kurrachee | 27 | 13 | 14 |
| „ Bombay | 28 | 6 | 22 |

railway travelling, it would increase the time of the journey from London to Kurrachee on the different routes as follows :—

London to Kurrachee *via* Marseilles, instead of 20 days 12 hours 28 minutes, there would be 8 hours and 45 minutes added, making the journey 20 days 21 hours 13 minutes.

London to Kurrachee *via* Brindisi, instead of 18 days 21 hours 24 minutes, there would be 14 hours 20 minutes to be added, making the journey 19 days 11 hours 44 minutes.

London to Kurrachee *via* Trieste, instead of 19 days 22 hours 39 minutes, there would be 11 hours 37 minutes to be added, making the journey 20 days 10 hours 16 minutes.

London to Kurrachee *via* Brindisi and Seleucia, instead of 12 days 22 hours 22 minutes, there would be added 19 hours 31 minutes, making the journey 13 days 17 hours 53 minutes.

London to Kurrachee *via* the proposed England and India Railway, instead of 5 days 16 hours 46 minutes, there would be 1 day 20 hours 36 minutes to be added, making the journey 7 days 13 hours 22 minutes.

On the other hand, if the rate of travelling by railway was taken at 50 miles an hour instead of 30, the time occupied by the England and India Railway would only be 4 days 10 hours and 13 minutes.

Having now shown the immense advantage that can be obtained in point of despatch by the England and India Railway over all other routes, we will endeavour to point out how this line can be completed and worked ; and firstly, we must direct your attention to the cost and capital required for completing the line ; secondly, to the arrangement for efficiently working it so as to benefit each of the countries it passes through, and at the same time be satisfactory to the public in general ; thirdly, the necessary steps to be taken for commencing the work and completing it in the shortest possible space of time.

First, as to the cost of the work. For the extension of the Austrian line from Trieste through Dalmatia the line passes through a very populous district and rather difficult country ; a large portion of the line will be a coast line, the

gradients will be very easy, there is no greater height to be overcome than 570 feet above the level of the sea, and the greatest work of engineering difficulty will be the crossing of the entrance to the Harbour of Cattaro. To keep this harbour open for shipping a swing bridge will be necessary, of a similar character to one upon the Chester and Holyhead Railway at the Foryd. (There are also upon this line gradients of 1 in 60, yet the Irish express averages over 40 miles per hour, including several stoppages between London and Holyhead on a line with an immense traffic and crowded stations.) Taking into consideration the difficult works to be executed on the Austrian portion of the route, and calculating as nearly as can be done without having *detailed plans and sections*, we should estimate the cost at 17,000*l.* per mile, including stations, engine sheds, and everything, with sufficient rolling stock for local traffic. We should have then for the extension in Austria 385 miles, at 17,000*l.* per mile, equal to the sum of 6,545,000*l.*

Turkey in Europe. The works along this portion of the line are of a very favourable character, a considerable portion will be a coast line, but nothing like so expensive as the Dalmatian portion. In crossing from Berat to Salonika, the ridge to be passed over is about 4000 feet above the level of the sea, and this is the highest point to be overcome upon the whole length of line to be constructed, and will entail a tunnel of about three quarters of a mile in length, and the gradients to overcome this height will average 1 in 90; some few will be rather steeper than this, so as to avoid heavy works in formation. A gradient of 1 in 90 for two miles, rises in that length 117·33 feet, one mile rising at a gradient of 1 in 60, and another mile rising at the rate of 1 in 180 would give the same result.

Taking into consideration the tunnel referred to (with the exception of which there are no works along that portion of the line, of any great difficulty), we consider that an estimate of 12,000*l.* per mile "to include as before, everything, and rolling-stock for local traffic" is quite sufficient. We have, therefore, 602 miles at 12,000*l.* per mile, which is equal to 7,224,000*l.*

The crossing of the Bosphorus by a steam ferry, we put down at 100,000*l.*

Turkey in Asia, from Scutari to the Mediterranean near Adalia, there will be two or three short tunnels; the gradients must be very easy, the greatest height above the level of the sea to be overcome, not exceeding 2900 feet, and the steepest portion of the line, will be passing down the White River from an elevation of 2700 feet, in a distance of 75 miles, giving an average gradient of 1 in 160.

From Adalia to Tarsus the works will be of a very slight character; from Tarsus to Alexandretta, passing round the Gulf of Iscanderoun, there will have to be a short tunnel, and between Alexandretta and the Lake of Antioch there will be another tunnel. From thence to the River Euphrates *via* Aleppo, the works will be of a very easy nature, the height at this point being about 950 feet above the level of the sea. From here to the Persian boundary, the country is nearly level, the only expensive works being the Iron Bridges for the crossing of the Euphrates, the Tigris, and their tributaries. Considering the great length of line upon the greater portion of which the works are exceedingly light, we have put down the sum of 9000*l.* per mile for this portion of the route, and consider it ample to include as before everything, in addition to the rolling stock for local traffic. Thus 1630 miles at 9000*l.* per mile, is equal to the sum of 14,670,000*l.*

In Persia, Beloochistan, and Scinde, the works being along the coast, and that not a rough or rugged one, the only important works as far as we can judge, will consist of bridges, and we estimate the cost at 8000*l.* per mile; we have thus for Persia 855 miles at 8000*l.* per mile, equal to 6,840,000*l.*, and for Beloochistan 674 miles at 8000*l.* per mile, equal to 5,392,000*l.*, and lastly for Scinde 23 miles at 8,000*l.* equal to 184,000*l.*

We find then for the total cost of the works, as follows:—

| | |
|----------------------------------|------------|
| In Austria | £6,545,000 |
| Turkey in Europe | 7,224,000 |
| Crossing the Bosphorus | 100,000 |
| Turkey in Asia | 14,670,000 |

traffic, and providing and keeping in repair the main double line of permanent way being formed, then 4000*l.* per mile will have to be deducted from the estimate already made.

Thus in Austria, with its 385 miles 1,540,000*l.* would have to be deducted, reducing the cost in that country to 5,005,000*l.* In Turkey in Europe a deduction of 2,408,000*l.* would in like manner be made from the original estimate, reducing the capital required in that country to 4,816,000*l.* In Turkey in Asia there would have to be deducted 6,520,000*l.*, leaving still 8,150,000*l.* as the cost of other works in that country. In Persia there would have to be deducted 3,420,000*l.*, reducing the original estimate to 3,420,000*l.* In Beloochistan the estimate would be reduced 2,696,000*l.*, leaving the cost required for the formation of the road at 2,696,000*l.*; and in Scinde the estimate would be reduced from 184,000*l.* to 92,000*l.* Thus the total cost for forming the line, &c., exclusive of the permanent way, would amount as follows :—

| | |
|---------------------------------------|-------------|
| Extension in Austria | £5,005,000 |
| Do. in Turkey in Europe | 4,816,000 |
| Steam Ferry for Bosphorus | 100,000 |
| Extension in Turkey in Asia | 8,150,000 |
| Do. in Persia | 3,420,000 |
| Do. in Beloochistan | 2,696,000 |
| Do. in Scinde | 92,000 |
| | <hr/> |
| Total | £24,279,000 |

The above capital would have to be raised by different companies on behalf of each country, and for their respective amounts. The railways in each country would be made complete in all respects, with the exception of the main line of permanent way, but having all sidings for the proper working of what may be termed the local traffic of each company, and each railway would be managed by the Board of Directors of that Company. The saving of capital in each country by the various companies in not having to provide the main line of permanent way, although having the use of the same, would act as a sub-

sidy and encouragement to each of the companies, especially those countries whose trade and commerce have not yet been developed, and where the existing traffic could not be expected to pay upon an expensively constructed line of railway; and the very opportunity of each of these countries being connected by a cheap line of railway for through transit, would tend very much to stimulate commerce in each.

The through traffic would be worked by the England and India Railway Company, to which all local trains in each country would be subservient. We might illustrate this by comparing the through trains upon this line to the express trains as worked at present upon any of our own lines, to which all other trains are timed and shunted, so as to leave a clear road for the through passenger express.

Until the Channel tunnel is completed all the through trains would start from Calais. Passengers and mails would travel by the ordinary carriages and boats from London to Calais as at present.

After leaving Calais, the through trains should not stop before arriving at Paris, and then only for a few minutes, for the purpose of attaching and detaching carriages, and changing locomotives. The next stopping place ought to be Turin, after that Trieste, then Salonika, after that Constantinople, and then near Antioch, then Bagdad, Bushire, some town in Beloochistan, and lastly Kurrachee. In addition to these, other stations would be fixed upon, for the purpose of changing the locomotive.

Another daily through train would start from Paris, stopping at the same stations as the through train from London. Another daily through train would start from Turin, stopping at the same fixed stations; another from Trieste, another from Constantinople, also Antioch, Bagdad, and Bushire, each starting daily for Kurrachee. Thus we should have an English French, Italian, Austrian, Turkish, and Persian through train leaving for India every day; and trains leaving India for each of these places respectively, with other trains between each of them, and other important fixed stations on the route.

The capital for this England and India Railway would

amount to at first 25,635,000*l.*, it being 5127 miles by 5000*l.* per mile. This would be ample for a perfect double line of permanent way, including complete rolling stock for working the through traffic, and with locomotive and carriage sheds and station accommodation at one principal city in each country. Of this capital 4,256,000*l.* would be due to France, Italy, and Austria in proportion to the 1064 miles of railway already finished along the main line in these countries, calculating for the permanent way to give the railway companies alluded to above 4000*l.* per mile, as deducted from the estimate for the cost of railway where the line has yet to be constructed in those countries.

Upon a line of railway upwards of 5000 miles in length, passing through and connecting the different countries named, none can doubt but that the through passenger traffic would pay a handsome dividend upon the capital named; and when to this is added the carriage of parcels and through trains of valuable merchandize, together with sums for carrying the mails, it would be considered a very safe investment, and we have no doubt the capital would be raised without difficulty.

The great difficulty that has to be overcome is the formation of Companies, and the raising the necessary capital for constructing the lines of railway in the different countries through which we propose to pass. This could be surmounted if the Governments of these countries were to take an active part in the matter. These different Companies, as well as the General Company for working the through traffic, should be formed at the same time.

A through traffic worked upon such a length of line could be carried on with great regularity, speed, and comfort, as well as being worked safely and economically; and the working expenses of such a traffic must be estimated at much less than that subjected to the fluctuating ordinary traffic between numerous stations requiring a great amount of dead weight in rolling stock.

In the formation of such a Company it is obvious that there would be unanimity between the different Governments of the countries through which the line passes, and, therefore, the

Board of Directors should have a representative from each of these Governments, as the line, to be worked satisfactorily, must be as one continuous railway and one company.

In reference to the line through France, Italy, and Austria, where the works are already constructed, several alterations and improvements will be necessary before it can be considered direct and continuous. In France there will be but little improvement necessary. Between Macon and Turin, likewise, but little need be done; but between Turin and Trieste there will have to be of necessity some improvement made, so as to shorten and make it more direct as a through line.

To attempt to describe the great benefits which naturally follow the construction of railways, and how they tend to the wealth of the districts they accommodate, would be superfluous; the question now is how to get them, their cost, and the laying out of the lines in the best manner for the improvement of the country.

An important point in discussion at the present moment, is in reference to the gauge, so as to economize as much as possible in the construction of the works. We are of opinion that the present gauge of 4 feet 8½ inches, is the one which should be adopted for a through railway to India. It is the gauge of the existing railways both in England and on the Continent, besides being the gauge of the present main lines in India. The gauge of 3 feet 3 inches, as adopted by the Governor-general of India, for the extension of minor lines in that country, or the still narrower gauge of the Festiniog Railway, in lessening the works of construction, and the cost of rolling stock, will admit of railways being made, where the present gauge would never pay. Such a small gauge is especially adapted for islands such as Corsica, the Isle of Man, &c., and while we admit this, and advocate the adoption of such lines under particular circumstances, we nevertheless consider that to obtain the speed and power necessary for working so large a traffic as that which will flow along this railway, uniting the nations of Europe and India, the existing gauge must be retained.

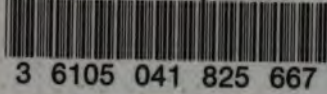
We have already alluded to the cost of constructing the main line, but the question may well be asked within what time can such a work be completed? Our answer is, that as there are no considerable works of engineering difficulty on any part of the line we propose to be constructed, we have no hesitation in saying that this noble undertaking could be completed in three years from the actual commencement of the work.

The time which will be lost before the Governments of the different countries will have fully investigated the matter so as to arrange for the concessions, and acquire the necessary land for the completion of the works, will doubtless be much more important than the time actually required for doing the work of construction. But if we could imagine the Governments of the different countries taking up the scheme at once, uniting their efforts, and with a trifling expenditure, endeavouring to facilitate the raising of the necessary capital, which we are persuaded is not difficult;—then, as there is no single work of construction upon the proposed line, which could not be completed within two years, we assert that in three years from the present time, it is practicable to have one continuous line of railway opened from England to India.

We except of course, the crossing of the Straits of Dover, the mode of passing over this, we calculate to remain, with some slight improvements, the same as it is at present.*

The line we propose is very favourably laid out for being expeditiously constructed; the great cause of delay in constructing an inland railway being the conveyance of materials for permanent works to the different points along the line. It is often absolutely necessary to complete one portion previously to the commencement of another, but in this case all the rails, girders for bridges and permanent works, can be delivered along the coast at different points in the Mediterranean, as

* The crossing of the Straits by means of a tunnel underneath is a work in which we have boundless faith, but we fear that this belief is only shared in by the few who not only know what the difficulties are which have to be encountered, but know also how to overcome them. We are anxious, therefore, not to mix up this work with the project of the England and India Railway.



To

also in the Persian Gulf and the River Euphrates, thus reducing the time for construction to the minimum.

In conclusion, we will briefly allude to the benefits that will be conferred upon some places by this line, and also where some persons might be disposed to think the effect of its construction would be injurious.

Take, for example, Egypt, the Suez Canal, and the lines of railway constructed there.

How will it affect the principal seaports of England, France, Italy, Austria, and Turkey, and their trade with India?

We will consider, first, the Suez Canal. It has been rumoured that the present traffic is not sufficient to make it pay, and that it is in contemplation to raise the dues upon vessels passing through. In our judgment this would be a suicidal act. Undoubtedly when the England and India Railway is constructed it will take much of the present traffic from the Suez Canal, and also from the railway between Alexandria and Suez, but the whole of the present trade would be revolutionized to a far greater extent than it has been even by the opening of the Suez Canal. But what we contend is that for any traffic which may be diverted from the Canal by the England and India Railway, there will be much more of a different kind added thereto by the stimulus given to the trade and commerce throughout the whole of the Mediterranean coast and the countries surrounding the line of railway.

Upon Plan No. 1, which is designed to show the general route of the proposed line, we have also shown various branch lines connecting the main through line with some of the principal parts of Turkey in Europe and Asia, the object of these lines being to create a trade between these ports and Alexandria and the Red Sea, where at present no trade exists.

For example, whilst Marseilles is at present the principal port in France for steam communication between France and Alexandria and the Suez Canal, so it will remain, with the additional advantage of being connected directly with the England and India Railway.

The same rule applies to Brindisi as the principal port of Italy at present, and to Trieste as the principal port for

Austria; and so it will be in Turkey, both European and Asiatic,—branches from the main line to some of the principal ports will open up steam communication between Prevesa, the most southern port of European Turkey, between Salonika, Gallipoli, Smyrna, Adalia, Alexandretta, and the Suez Canal, and through the Red Sea.

Thus England, France, Italy, Austria, Turkey in Europe and Asia, would have mutually competing steam-packet services between their respective ports and the Red Sea, *via* the Suez Canal, both for merchandize and passengers to Egypt and the East.

It cannot, therefore, be said that the construction of the England and India Railway will injure the Suez Canal; the reverse will be the case; each and all would be benefited; and by the healthy competition thus afforded from so many parts, all concentrating at Alexandria, the trade would be increased tenfold.

We find that this letter has extended to a greater length than we at first anticipated, still not greater, we hope, than the importance of the subject demands.

We lay the matter before you, trusting with confidence that the English Government, whose commercial, military, and political interests are so intimately connected with India, will take the initiative in proposing a conference of representatives from each of the Governments of the countries interested, so as to confer together with the object of advising what steps should be taken to grant concessions for the most speedy and economical routes, and for having the work accomplished without further loss of time.

We beg leave to remain,

SIR,

Your obedient Servants,

WILLIAM LOW,
GEORGE THOMAS.

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