

STEAM COMMUNICATION WITH INDIA.

Dr. Lardner, on the evening of yesterday week, delivered a lecture on this question. The subject, he said, was one of very considerable importance, but of peculiar importance to that city (Bristol); taking it in its whole extent it was the solution of a problem how far the present powers of steam were capable of being extended in their application to navigation. The moment this question was proposed, two grand commercial problems would suggest themselves—namely, the connection by steam of Great Britain with our colonial possessions, and the connection by steam of Great Britain with the United States of America. These two questions embraced a great variety of topics of much interest; he therefore proposed, with the approbation of the general council, to throw into their observations all the more popular and more intelligible parts of the subject, reserving for the morning meeting the more technical details. The subject to which he wished more particularly to address himself this evening was the application of steam to communication between Great Britain and India. There were several routes by which a communication could be effected; the only route which was in a continued line of navigation was the ordinary voyage by the Cape. That had been already tried by steam, but if it had not, they were sufficiently conversant with the properties of the present steam-engine to know that that voyage was perfectly impracticable—that it was incapable of being worked profitably. The voyage was attempted by the Cape by the *Enterprise*, and it was performed in 113 days, but only 64 days were worked by steam; it afforded evidence that to establish a line of steam communication by that route was out of the question. The other routes were partly by land, and partly by water. One from Great Britain by the Rhine across Germany, by the Danube, the Black Sea, across Turkey to the Euphrates, descend to the Persian Gulf, and then pass on to India; but this route was out of the question, from the difficulties to be encountered. The real practical courses, then, which presented themselves were only two, and those were connected to a certain point. They proposed starting from Falmouth and proceed to the Mediterranean, indeed we did that already to Malta; therefore, it was not necessary to discuss the practicability of that route. From Malta they would adopt either of two courses—one would be through the Straits of Gibraltar, then to proceed to Alexandria, a distance of 800 miles, and quite within the present limits of steam power, as 1,600 miles had already been performed. They then proceeded to Syria, and descended the Euphrates. So far as Alexandria there was no practical difficulty. They then proceeded to the Red Sea by land, or partially by the Nile; then to Cairo. If they would refer to the plan of the Isthmus of Suez, the road to Cairo followed the banks of the Nile. The only difficulty they had to encounter here was the isthmus. They would have to proceed to Suez by a sandy desert, but about the centre of it there were springs of fresh water, and the distance did not exceed 70 miles, and was now performed in less than 24 hours. It was, however, suggested that a canal might be cut across, and the idea had been thrown out that a railroad might be constructed. Now, there were other modes of crossing the isthmus which were deserving of notice. The general character of the isthmus between the Mediterranean and the Black Sea was very peculiar. When we proceed due north we pass over three miles of land very little elevated above the surface of the Black Sea. We then come into a narrow valley, bounded on each side by hills, and in the centre of this valley we find the distinct trace of a canal, which is known to have existed in former times, and with the history of which we are well acquainted. The canal now existed in many places in as perfect a state as many of the old canals in this country; but one of the remarkable peculiarities was this—that a great portion of its surface was not only below the level of the Red Sea, but still more remarkable, was below the level of the Mediterranean; now the valley from the point three miles towards the Mediterranean was below both. That this valley was, at some time or other, filled with water connecting the two seas, was rendered probable by the fact, that it was lower than the level of both the two, and that the water which remained was, in fact, salt, and was called the bitter lake. That portion of water was, in fact, a part of the ancient canal. Coming to a point midway between Suez and the Mediterranean, we found two other lines of hills. The canal was conducted into the hill near Cairo, and had connected Suez with Cairo. One third of that canal now existed, and only required to be cleaned out, and the other portion could be restored. This canal was begun by Senosiris, and was the channel by which European commerce was conveyed to the East. But this stupendous work could only be used two months out of ten, for the ancients were unacquainted with our contrivance of locks; nevertheless, during those two months the trade of Europe passed in this canal to Suez. During the other ten months the commerce passed up the Nile, and then to an ancient port, where they embarked on the Red Sea. Now it was proposed to open that canal and to lock it. As far as Suez no physical obstacle arose. The Red Sea was the next point for consideration, and much had been said about the difficulties which existed in the transit through this sea, owing to the beds of coral, but they were confined to the coasts, and were well known to the local pilots, and created no more difficulties than the rocks which existed on our own coasts. The steam navigation of the Red Sea was practicable and convenient, and there were several safe harbours. Proceeding downwards, they came

in a run of about 300 miles to Cossier, from whence they could go 500 or 400 miles further to Jeddah, on the opposite side of the coast, where was the port of the city of Mecca. There was another town, Mocha, where there was a safe roadstead. On the coast of Arabia there were two or three harbours, all of which were convenient. So far there was no practicable difficulty. He should state, however, that the voyage from north to south of the Red Sea was more easy than from south to north. For ten months the north wind blew so violently that no steam packet could face it; but in that case they must land the passengers at Cairo. They now came to the real point of difficulty in the case. When they proceeded from the ports on the Arabian coast they had a long run to get to the nearest port of India, namely, Bombay, that being 1,200 miles. Now, when they had to encounter a run of this kind, which approached very near the extreme limit of our present powers of steam navigation, it became a question of the last degree of importance whether or not they should have average weather. Now, the seas between Arabia and Africa and India were subject to periodical vicissitudes, which were unknown in our climates. There was a periodical wind which blew as regularly as the sun rose and set, and blew with an intensity to which we were little accustomed. They were known by the names of the north-east and south-west monsoons. The south-west blew from June to September. They would readily perceive there would exist no steady atmospheric current of that kind without having some counter-current to produce an atmospheric equilibrium. Accordingly they found the counter current flowing in the opposite direction between November and March, but although they blew about equal times, they were very different in intensity, and in their effects on the waters. The north-east monsoon was a wind against which a steam vessel could go without any difficulty. Consequently, during the months from June to September, the navigation was impracticable from Bombay, but it was practicable during all the year from Europe to Bombay. The swell for 800 miles from Bombay was such, that if they attempted to use sufficient power to propel the vessel, it would drive her into the sea. The valley he had mentioned as the land was the land of Goshen, mentioned in the Scriptures. The other route was from Malta to any part of Syria, and was without difficulty from those ports to the banks of the Euphrates; but then there were some other difficulties; the passage was not across a sandy desert, but it was infested by savage tribes, who were not professed robbers, but would not stop much to consider the propriety or impropriety of robbing you. The town which had been suggested as the point of departure was Burr, 1,200 miles from the mouth of the river. Now this river was one which presented many circumstances extremely questionable for the application of steam navigation; the average speed of the current of the river was no greater than three miles an hour; at certain points, however, it rose to seven miles an hour. The magnitude of the river they might form a notion of when he told them, that at Burr the breadth was something like the Thames at Lambeth, and down as low as Babylon it flowed like the Thames at Deptford. The depth of the river was quite sufficient for safe and speedy navigation; but this river was subject to a low season, during which there were some difficulties—it existed only in a part of the river. Passing Babylon and Bagdad you came to a village called Elkain, a distance of about 170 miles, and in these 170 miles were included all the physical difficulties. There were 15 or 16 shallows and rapids, which in the low season were difficult; but it did so happen that the low season of the Euphrates was the very season during which the north-east monsoon blew—the impracticable season of the one was during the practicable season of the other. It was proposed to navigate by iron vessels, and coal might be obtained from Wales at a cost of about £2 per ton. In ancient times the communication between England and India was by the Euphrates, and step by step the very route they were now thinking of resuming, and it was a remarkable circumstance how the progress of civilization seemed to sport with our endeavours. Before the discovery of the Cape, our merchants found their way to India by the Euphrates, and a Portuguese was immortalised for the discovery; but another discovery was made by means of the steam engine, and that sent us down the Euphrates again in the old way to India. It was apparent that if we chose both lines, the communication would be uninterrupted throughout the whole year, and the voyage by either route from Falmouth to Bombay might be done in seven weeks.

Friday, September 1.

Mr. Davies Gilbert in the chair.
Mr. Chatfield read a very long essay on naval architecture.
Mr. Evans gave a long account of the Cornish steam engines.
The action became very impatient, and called for Dr. Lardner.
Mr. Thomas Moore came into the room, and was received with much applause.

STEAM COMMUNICATION WITH DISTANT PARTS.

Dr. Lardner said, he could not open the important business which had been appointed for this day, without expressing his regret that, important as it unquestionably was, and involving as it did the interest of large branches of commerce, it should have interfered with another inquiry which, it was attractive for a moment, was in no respect inferior in its ultimate value. The very circumstance of the present and pressing interest which was felt upon this subject of steam communication to distant parts of the world—the fact that already considerable investments of capital had been made in

such speculations—these were circumstances which would somewhat embarrass them in arriving at a safe and certain conclusion, because it would be obvious that they would, more or less, engender in the minds of a considerable portion of prejudices which would be liable to bias their judgment, unless they used a good deal of self-control, and brought with it the exercise of their own judgment. He would therefore beg of every one, and more especially of those who had a direct interest in the enquiry, to dismiss from their minds all previously formed judgments about it, and more especially upon this question to be guarded against the conclusion of mere theory; for if there was one point in practice of a commercial nature which more than another required to be founded on experience, it was this one, of extending steam navigation to voyages of extraordinary length. He was aware since the question had arisen in that city, it had been stated that his own opinion was adverse to it; that impression was totally wrong; but he did feel, that as steps had been taken to try this experiment, great caution should be used in the adoption of the means of carrying it into effect. Almost all depended on a first attempt, for a failure would much retard the ultimate consummation of their wishes. He believed those in the section who knew him would readily acquit him of being forward to question the power of steam. He tendered the most unqualified allegiance to the sovereignty of steam, but he tendered the allegiance of a free and thinking subject to a constitutional monarch. He did not bow before the power of steam as an abject slave, and if he found a failure in the administration of that power, he attributed it entirely to the ministers. (Cheers.) There were distinctions to be drawn, depending on the length of the trips and on the stages into which they were divided. There was one main distinction between the operation of a marine engine and a land engine. The marine engine was used with salt water, and the land engine with fresh water. Heat would convert that water into steam; but the heat which would do that with the water would not do that with other subjects which were combined with sea water; it would not do that with salt, which in consequence produced an incrustation in the boiler, and this was most injurious. A remedy for this had been discovered which was almost perfectly efficient, which was the use of copper boilers. There had been a contrivance brought into operation, which, if it was as effectual as its promoters considered it to be, would be a perfect remedy—he alluded to a condenser which was known by the name of Hall's condenser, which was so contrived that the steam circulated like the blood in the human frame; but this had been discovered by Watt, who had left little for his successors to do. With regard to the power of steam engines, practical men considered that for short trips the best proportion was to give the vessel the power of one horse for every two tons; that as the length of the trips increased they must have a smaller proportion of power; there should be three tons for every horse power, and that for the longest trips to which steam power could at present be applied, the proportion should be about one horse to four tons. It might be asked why this particular proportion was selected? and the answer was this—that it was found by experience that such would not contain sufficient coals; but the surplus of power in long voyages would be invaluable where power was most valuable. It was necessary they should devise some means of determining the locomotive duty of coals. It was a question to which he had devoted a good deal of time, and the only method he had been able to advise had been to determine the consumption of fuel per hour. He had made extensive observations, and he considered you must place 15lbs. of coal per hour for every horse. Mr. Watt some time since established a series of experiments on boilers with the view of determining the relative consumption of fuel, and the result was this—that the consumption of fuel under the marine boilers was one third less than under the land boilers. A committee of the House of Commons, some time since, had to determine the expediency of opening a long steam communication with India, and much evidence was given. In one case, the opinion was 8lbs.; in another, 9lbs.; and another, 11lbs. They would take nine months. And then came the question of speed. They were all well aware that there had been for some years in operation a line of steamers by Falmouth and Corfu; they touched at Gibraltar. On an average of 51 voyages, the rate at which they made their trips was noted, and the result was seven miles and a quarter per hour. They had, therefore, the conclusion, that the locomotive duty of 9lbs. of coals was seven miles and a quarter of distance. If therefore, 9lbs. gave seven miles and a quarter in distance, one ton would give 1,900 miles for every horse power. Then we must look for average weather; the build of the vessel was such that they had not space to try more than 14ton of coals for every horse power. Almost all the vessels with which the experiments had been made had the patent paddle wheels, and they had been worked with the best coals. The next question was, what modification the vessel must undergo when applied to steam communication with the United States. In the Atlantic there were westerly winds which prevailed almost continually, and were extremely violent, and attended with a great swell of the sea, but it was an astronomical phenomenon which was very well understood. The outward voyage of the great packet ships was generally estimated at 40 days, the homeward voyage at 20 days so that the entire voyage occupied 60 days. If, then, they assumed that the average of outward and homeward voyage to the United States corresponded with the average weather between Falmouth and Corfu, then they would arrive at this conclusion—that the out-

ward voyage was worse than the average in the proportion of 4 to 3. If the locomotive duty of coals provided for the voyage between Falmouth and Corfu was 1,900 miles for a ton per horse power, they must deduct from that 33 per cent.: in order to get what the duty would be on the outward voyage to New York, you must take a third from 1,900, and you would have 1,300 miles. By the direct line from Bristol to New York the distance was 3,500 miles; if you allowed one ton of coals for every 1,300 miles per horse power, the vessel would require to carry 2½ tons for every horse power in her engine; therefore this vessel must carry nearly three times the whole complement the Admiralty steamers could carry. Let them take a vessel of 1,600 tons, provided with 400 horse power engines; they must take 2½ tons for each horse power, the vessel must have 1,348 tons of coal, and to that add 400 tons, and the vessel must carry a burden of 1,748 tons. He thought it would be a waste of time, under all the circumstances, to say much more to convince them of the inexpediency of attempting a direct voyage to New York, for in this case 2,080 miles was the longest run a steamer could encounter; at the end of that distance she would require a relay of coals. The question then became a geographical one, as to the best mode of accomplishing this. There were two ways which might be proposed; one, to make the Azores an intermediate station, and to proceed from thence to New York; the other would be to proceed to some point in Newfoundland, and make that an intermediate station. The distance from Bristol to Azores was 1,300 miles and from the Azores to New York 2,400 miles, being twenty per cent. more than the steam limit he had mentioned. There was a point called Sydney, in Cape Breton, where there were coal mines worked to a profit by Messrs. Russell and Bridge, but then that was 2,300 miles; but if we took our final departure from some place upon the western coast of Ireland and there charged the vessel with coals, the distance to Sydney would be only 1,900 miles. The railroad system might be established in Ireland, which would be a benefit in more ways than one. (Cheers.) London and all the southern section of the country would pour in their produce and population by the railway to Bristol. (Cheers.) He would assure them he had a mind totally disinterested; he was not an engineer, and had not a share in any joint stock company, because he felt that to render useful to the community, those facilities nature had given him, he should deprive himself of part of that utility if he placed himself in a situation that any one could say he could by possibility have any interested motive. He would therefore, counsel those who proposed to invest capital in this most interesting enterprise to keep in mind certain points to which he would direct their attention. 1st. He would advise that the measured tonnage should correspond with the tonnage by displacement. 2nd. To go to an increased expense in using the best coals. 3rd. He would earnestly impress upon them the expediency of adopting the paddle-wheels shown in the section yesterday. 4th. He advised the proportion of one to four on the proper tonnage. 5th. He would impress upon them the expediency of giving more attention in the selection of engineers and stokers; it was a matter of the last importance, and a saving of thirty to forty per cent. With respect to the boilers, he would recommend copper ones. Lastly.—He would advise the coal boxes to be tanked. (Loud cheers.) Mr. Russell would confess he had listened with the greatest delight to the lucid and logical observations they had just heard. He would merely add one word—let them try this experiment with a view only to the enterprise itself, but on no account to try any new boilers or other experiments, but to have a combination of the most approved plans that had been yet adopted. (Cheers.) Mr. Brunel then pointed out some errors in the calculations made by Dr. Lardner, which would be in favour of the undertaking; he was convinced nine or even ten miles an hour might be accomplished, and Dr. Lardner had formed his conclusions upon old vessels, and not from one in which everything was done upon the most approved principles yet known, and thus reduced possibility to certainty. (Cheers.) Mr. Field said, he had made the calculations for the Ordnance on the vessels to Corfu; they were taken upon an average which included the infancy of the undertaking. Dr. Lardner in reply said, that he thought the voyage practicable; but he wished to point out that which would remove the possibility of a doubt; because, if the first attempt failed, it would cast a damp upon the enterprise, and prevent a repetition of the attempt. This discussion created the greatest possible interest.

LONDON, SEPTEMBER 5.

The meeting of the Bank Directors on Thursday, gave occasion among its results, to the promulgation of the following notice:—

"The Governor and Company of the Bank of England do hereby give notice, that on and after the 1st inst., they will be ready to receive applications for loans upon the deposit of bills of exchange, Exchequer bills, East India bonds, or other approved securities, such loans to be repaid on or before the 20th October next, with interest at the rate of 5 per cent. per annum, and to be for sums of not less than £2,000 each."

"At the Court of Directors of the Bank of England, on Thursday, the 1st September 1836, resolved, that the interest on bills of exchange and notes discounted by the Bank, be advanced to 5 per cent per ann."

The occasion for this measure appears to have been two-fold—to give a further check to the exportation of bullion, the diminution of the quantity of which is apparent from

the last gazetted returns of the Bank averages, and to relieve that establishment from an undue pressure for accommodation, arising from the circumstance of its former rate of interest required upon advances made, being below that which the demand for money enabled capitalists out of doors to command. Beyond a cautious desire not to increase the amount of their securities (and they have manifested no disposition materially to diminish them,) the operations of the Bank Directors have no obvious excitement; but they are manifestly placed in a difficult position before the public, when the whole responsibility of a superabundant circulation, if it exist, is imputed to them at the time when the issues of provincial establishments, not subject to even the same degree of publicity, are let loose with lavish recklessness.—There is good reason however, to hope that this further check upon an extreme facility of credit, coming as it does, at a time when the foreign exchanges are showing a more favourable tendency, will speedily and quietly restore the circulation to its wholesome limits, and cause a reflux of that bullion which, abstracted from this country, must exist in needless abundance elsewhere, and therefore be accessible to the legitimate demands of commerce.

Colonial Bank Shares are firm at 14 pm., but those of the British N. American Bank, are at 1 1/2 ds.

The advance in the rate of interest, which was resolved upon at the Court of Directors of the Bank of England, held on Thursday last, has given rise to a great deal of conversation in the City; and the opinions entertained as to the policy of the measure, are extremely diversified. The object contemplated by the Bank, viz. to produce an alteration in the Foreign Exchanges favourable to this country, and thereby checking the exportation of the precious metals, has been already partially effected, the rates of exchange yesterday afternoon having improved. The course taken by the Bank will also, it is confidently believed, lessen the amount of paper circulation here connected with joint Stock Bank and other transactions in America. The demand for bullion for exportation has much decreased, and it is not apprehended that the rise established in the value of money by the determination of the Bank Directors to increase the rate of interest, will check to any material extent, the activity which continues to prevail in the manufacturing districts and the commerce of the country. The Public Securities were only affected by the notice to the extent of about 1/2 per cent., and Consols for money and Account have since rallied to within 1/2 per cent. of the quotations obtained before the notice referred to were issued.—*Bell's Messenger.*

ROAD WORK.

CONTRACT.

PROPOSALS will be received at the Secretary's Office, until the first of November next, for opening a Road lately explored from Frederickton to the Petitcodiac River, passing through or near the New Canaan and Buttertut Ridge Settlements, and also intersecting the Canaan Stream, Coal Creek, Little and Newcastle Rivers.

The Road to be opened fourteen feet wide; all the Trees, Roots, Stumps, Stones and Brush to be removed therefrom, and to be levelled so as to make the Road passable for Sleds and Sleighs in winter.

A Plan of the Road may be seen at the Secretary's Office.

An advance of money, not exceeding one half the amount of the Contract, will be made on the party giving good and sufficient security; the remainder of the payment will be made as soon as the work is completed, inspected and approved.

Specifications and Tenders will also be received for the several Bridges on the line of Road.

Secretary's Office,
24th September, 1836.

STAGE.

THE Subscribers beg leave to intimate, that they intend running two STAGES between Newcastle and Frederickton, and to start from Newcastle for Frederickton every Wednesday morning at 12 o'clock, and from Frederickton for Newcastle every Wednesday at the same hour precisely.

Every attention will be paid to Passengers, and those persons who may wish to engage their passage, can leave their names, at Mr. D. McLeod's, Frederickton, and at Mr. Hamill's, Newcastle, on each Tuesday evening previous to starting, and pay the usual passage money of 45s.

A reasonable quantity of baggage will be admitted.

WILLIAM SWIM,
JAMES SWIM.
Frederickton, 1st September, 1836.

CAUTION.

A NOTE of HAND, drawn by Edward Doherty in favor of John Toole, dated Saint John, 1st October instant, payable in 3 months, and endorsed by the said John Toole and Robert Rankin & Co. was enclosed by the said R. Rankin & Co. under cover of that date, and forwarded to Frederickton by the Steam Boat *Frederickton*, to be offered for discount at the Central Bank. The Letter enclosing the said Note having been abstracted from the Steam Boat Table, all persons are hereby cautioned against purchasing the said Note.

R. RANKIN & Co.
Frederickton, 11th October, 1836.

NOTICE.

THE Subscriber having, in consequence of the precarious state of his health, retired from business, offers his establishment and Stock for sale, consisting of DRUGS, MEDICINES, PATENT MEDICINES, Shop Furniture, &c. &c.
AMASA P. COY.
Frederickton, 4th October, 1836.