

EAST INDIA.

STATEMENT of the Quantity of Land under Cultivation in each District of the Madras Presidency, distinguishing Land Irrigated and Land under Dry Cultivation, with the Amount of Government Assessment paid thereon, and the Total Land Revenue in each District *pro-Act*, Current of all Assessments due to the Government of Madras during the Seven Years from 1847 to 1853, the Sum of the Expenditure for Forest Works, with the Assessments to such Applications.

(Mr. Home)

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574

Under 12 cc.

EAST INDIA TELEGRAPHS.

RETURN to an Order of the Honourable The House of Commons,
dated 30 March 1855;—for,

COPIES "of REPORTS from *India*, and LAWS or DECREES passed,
respecting TELEGRAPHS; and of any Despatches from the Court of
Directors regarding the Establishment of ELECTRIC TELEGRAPHS in
India."

East India House,
4 May 1855.

JAMES C. MELVILL.

(*Sir Joshua Walsley.*)

Ordered, by The House of Commons, to be Printed.
16 May 1855.

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COPIES of REPORTS from *India*, and LAWS or DECREES passed, respecting TELEGRAPHS; and of any Despatches from the Court of Directors regarding the Establishment of ELECTRIC TELEGRAPHS in *India*.

IN a despatch to the Government of India, dated 26th September 1849, after referring to certain experiments on Electric Telegraph lines which had been made by Dr. O'Shaughnessy in the neighbourhood of Calcutta, so far back as the year 1839, the Court of Directors of the East India Company went on to say—

“The subject of establishing Electric Telegraphs in India is one of great importance, and though it appears to us that such a means of communication would be highly advantageous to the state and to the community, many serious considerations are involved in the question.

“We are desirous of receiving your opinion as to the expediency of establishing a system of Electric Telegraphs, independently of those which may be made simultaneously with the construction of each railroad, and in the event of your taking a favourable view of the subject, we should wish to be informed of the means which in your opinion could be best employed for carrying it out.”

No. 22 of 1852.—Home Department.

To the Honourable the Court of Directors of the East India Company.

Honourable Sirs,

We have the honour to transmit the accompanying Report from the Government of Bengal, announcing the completion, by Dr. W. B. O'Shaughnessy, of the line of electric telegraph from Calcutta to Kedgeree, together with a Minute recorded by the most Noble the Governor of Bengal, recommending that, in acknowledgment of the merits and services of this officer, a reward of *Rs.* 20,000 should be assigned to him. That, with reference to the success which has attended this experimental line, your Honourable Court should be solicited to authorise the immediate commencement of a line or lines from Calcutta to Agra, Bombay, Peshawur, and Madras, either simultaneously, or in the order set forth, and that, to expedite and facilitate this object, Dr. O'Shaughnessy should be specially deputed to England, in order that he may lay before your Honourable Court every information that may be needed, and at the same time have an opportunity of making himself acquainted with the systems prevailing in England, on the Continent, and, if thought advisable, in America also.

2. We concur in the views and approve of the suggestions made by the most Noble the Governor of Bengal, and have authorised the payment to Dr. O'Shaughnessy of the sum of *Rs.* 20,000, as a reward for his services in conducting this important experiment, those services having been rendered gratuitously. As, from the eminent skill, care, and economy evinced by Dr. O'Shaughnessy, we consider him to be better qualified than any other person to be entrusted with the superintendence of the electric telegraph operations in India, we have communicated our entire approval of the proposition to direct that officer to proceed immediately to England, for the purposes explained in his Lordship's Minute; and we feel confident that your Honourable Court will protect Dr. O'Shaughnessy from all pecuniary loss, by the necessity which the rules of the service impose for his vacating his present appointments of Deputy Assay Master and Chemical Examiner.

We have, &c.
(signed) *Dalhousie.*
F. Currie.
J. Lewis.

Fort William, 23 April 1852.

PAPERS ON THE ESTABLISHMENT OF

From Dr. W. B. O'Shaughnessy, Superintendent Electric Telegraph, to
J. P. Grant, Esq., Secretary to the Government of Bengal.

Sir,

IN obedience to the wishes of the most Noble the Governor of Bengal, I have the honour to submit the following Report, showing the present state of the lines of electric telegraph now constructed and in operation, the working and results of the system of correspondence in use since the offices have been opened for actual business, the expenses incurred in all branches of the undertaking, and the bearings of our present experience and information on the construction of lines to the North-western Provinces, Bombay and Madras.

2. The lines now in actual use for public business are—

1. Calcutta to Diamond Harbour, direction N. and S.	30 miles.
2. Bishtopore to Moyapore, meeting No. 1 half way, direction E. and W.	11 "
3. Kookroohattee to Kedgerree, including the Huldee River, 4,200 feet broad	25 "
	<hr/>
	66 miles.

The lines ready for use,* when the crossing of the River Hooghly has been permanently effected, are—

4. Diamond Harbour to Kholakbah	3 ½ miles.
5. Buffalo Point to Kookroohattee	1 "
6. Tarapooka extension line on Kedgerree side	10 "
7. Hooghly River	1 ½ "
	<hr/>
	16 miles.

TOTAL Lines - 82 miles.

Description.

Description of
lines.

3. The Calcutta and Diamond Harbour line runs from Chand Pal Ghaut, Calcutta, to the Post-office and Semaphore building at Diamond Harbour.

Under-ground.

4. There is one conductor of ¾-inch iron laid under-ground, in a cement of melted rosin and sand (in the manner minutely described in a former Report), from Chand Pal Ghaut, by the course, across the Meidra, over Alipore Bridge, through the populous bazaars and suburbs of Alipore, Bursia, and Beyla, through the mission station of Thakoorpookur to Rajmoolla Chuck, a village on the causeway, where the over-ground system commences. The iron rod is thence extended through Kurreebarra, Bistopore, Rajhat, and Sursya, to Diamond Harbour, on bamboo poles 15 feet high, coated with coal-tar and pitch, and strengthened at variable distances by posts of saul wood, teak, and iron wood from Arracan—all under observation, with reference to the comparative effects of the weather, wet earth, insects, &c., on the several kinds of timber employed. To these posts the iron rod is screwed by powerful iron clamps.

Over-ground.

Moyapore line.

5. At Bishtopore, half way, this line is divided at a central bungalow, where the Moyapore † branch meets that from Calcutta at a right angle. The line to Moyapore is constructed over-ground in the same manner as that just described; but there being no road, it runs on the footpaths in use between the island villages, and crosses for some miles through rice swamps, jeels, and creeks, on which no road or embankment or bridge exists. Much of this line was constructed during the rains, the welding of the iron rods having been done in canoes.

6. The-

* Now open (29th March 1852).—(Signed) W. B. O'S.

† Moyapore, a corresponding station on the river side, a frequented anchorage, powder magazine, &c., and close to the place where the Bombay mails cross the river.

6. The country between the two stations is, in fact, a lake from June to December. I purposely selected this troublesome and objectionable line, on the principle which I have all through this undertaking been guided by, that of encountering the greatest difficulties first, so as to know the worst at once. Expense and labour thus incurred lead clearly to economy and facility in the construction of other and more important lines.

Led across swamps and rice-fields.

7. The lines of conductor from Diamond Harbour to Kola Khali, Buffaloe Point to Kookroohattee, Kookroohattee to Kedgerree, and the extension by Tarapooka Ghaut, are all over-ground, on bamboos, with eight to ten substantial saul, teak, or iron-wood posts to the mile; these provided with strong binding screws. These lines are all erected on the pathways provided for the dawk runners, or on the banks of the rivers. The Huldee River crosses the Kedgerree line half way, varying in breadth from 4,200 to 5,800 feet, according to the season. A gutta percha covered wire, secured in the angles of a chain cable, is laid across and under this river. The chain cable is found to afford perfect protection against the grapnels of the heavy native boats which incessantly pass up and down, and which, owing to the violence of the currents and the danger of the quick-sands, are compelled to drag their anchors when they move at particular times of the tide.

Diamond Harbour to Kedgerree.

Crosses Huldee River at Kedgerree side.

8. The over-ground lines above specified differ totally from those in use in England, America, or any other country, in the following most important points: no wire is used; instead of wire, I employ a thick iron rod $\frac{3}{4}$ -inch diameter, weighing one ton to the mile (the heaviest wire used elsewhere is 1 cwt. to the mile). The use of these iron rods presents the following great advantages over wire:—

No wires used on our lines.

1st. Immunity from damage, or fracture by gusts of wind or ordinary mechanical violence. In the hurricane of the 23d and 24th October, last year, not one of these rods was broken; while, in my own experimental line of wire constructed in 1839, every north-wester broke many of the wires.

Advantages in using thick iron rods; shown by hurricane of 23d and 24th October last.

2d. If accidentally thrown down by the sliding of an embankment or any other cause, these rods are not injured, although passengers, bullocks, buffaloes, and elephants trample on them as they pass.

3d. They cannot be broken or bent without giving great trouble, and requiring the use of smiths' tools, so that mere idlers do not meddle with them.

4th. By their mass of metal they give so free a passage to our electric currents, that no insulation is required. We attach the rods to our bamboos, posts, &c., without employing glass, porcelain, or any other non-conductor; yet through these lines we work without interruption, during tropical deluges of rain, with miniature batteries, consisting of a dozen cells of platinum wires and zinc. This non-necessity for electric insulation further gives us great protection against lightning. The moment rain falls we are almost safe, as the lightning which strikes the line escapes by the wet posts to the ground.

5th. Again, our system differs from that adopted elsewhere by the rods being placed on the supports, without occasion for the straining and winding apparatus which must be employed with wires. This tension renders wire incessantly liable to fracture, and occasions much expense in construction, and much difficulty in repairs. Avoiding this strain enables us to use bamboos as our principal supports, which has special advantages, subsequently pointed out.

No tension required on our lines.

6th. The thick rods admit of rusting to take place to an extent which would be fatal to a wire line unless coated with zinc, a process which weakens the wire, and adds much to its cost.

7th. In point of expense there is no objection to the use of rods; if imported direct, they would not cost more than 10*l.*, say 100 rupees per mile. The cost of welding is one quarter more; that of carriage or transit is doubtless greater than for the lighter wire; but all this included falls far below what would be expended on the winders, insulators, zinking, and straining posts absolutely necessary on a wire line.

Rods not more costly than thin wires.

9. That the welding of the lines of iron rods presents no practical difficulty is shown by our experience; we have on several occasions, with one village forge, carried

Welding of rods no difficulty.

carried by two coolies, welded up a mile of rods in a working day. The rods are previously prepared, in 200 feet lengths of a central depôt.

10. I have enumerated these facts in detail because I attach great importance to the iron-rod system, as different from that of wires, and most especially with reference to its value in India. If we have to construct lines for general communication, our track will often run through a "howling wilderness," tenanted only by wild beasts, or mere savages in human form; while on our best roads, even if we entertain a police establishment, we may rest assured they will take but slight troubles on their duties. The lines must protect themselves, or incessant interruptions will take place.

Rods not injured by birds or monkeys.

11. I pass over with slight remark the damage done to wires, in my experiments in 1839, by birds and monkeys; whole swarms of crows, kites, and fishing eagles may now be seen daily enjoying themselves on our lines through the swamps of the Diamond Harbour road; they cause us no harm, and we do not molest them; our correspondence flies through their claws without interception; but it has happened on one occasion that a flash of lightning struck the wet rod, and killed some scores of its harmless incumbents.

Use of bamboos.

12. The use of the bamboo for supporting posts demands especial notice; at first I only tried it as scaffolding, to be replaced by teak or saul posts; I did not suppose it possessed of sufficient strength or durability to be permanently employed; but the hurricane of the 23d and 24th October exposed our lines to an ordeal I never expected they could go through unharmed: while trees, the growth of centuries, were uprooted, houses of solid masonry levelled with the ground, the country inundated, the "Precursor" and "Powerful" steamers driven ashore, a fleet of ships and innumerable native craft wrecked or dismasted, not one of our posts was broken. It was the realization of the fable of the bulrush and the oak: the bamboo bent slightly to the hurricane, and rose erect when its violence had ceased.

Bamboos resist storms which destroy timber posts.

Cheapness of bamboos.

13. In point of durability, the bamboo may be open to objection; but this must be viewed with reference to prime cost, abundance and facility of supply, and degree of labour in construction, whatever timber be employed; now 100 bamboos cost, carriage included, say *Rs.* 16; 100 saul posts of equal length, *Rs.* 300. The saul posts must be renewed in eight years, as shown by the present state and history of the palisades of Fort William.

	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Bamboos, 200 per mile	32	-	-
Renewed, say in every two years in eight years	128	-	-
Cost of saul posts, 200 at 3 rupees	600	-	-
Difference in favour of bamboos in one mile	472	-	-

14. Thus the comparative cost in eight years would be, as shown in the margin, *Rs.* 472 per mile in favour of the bamboo. It should be added, that the lightness of this kind of posts, the abundance and ubiquity of its supply, the ease with which it is worked, and the rapidity with which it is placed, are all practical advantages of such real value that I am persuaded that were bamboos available in Europe, no other supports would be employed.

Objections to European over-ground system still maintained.

15. While the over-ground system, on the plan I have followed, presents the great advantages of rapidity in construction, exceeding cheapness, and immunity from accident, from storms, lightning, and wanton injury, to a degree I could scarcely have anticipated, I am bound to say that the objections I recorded in 1850, in my Report to Government, to the European and American over-ground system, as advocated by Colonel Forbes, remain totally unaffected by the results now attained and described; but, were this otherwise, had it been that my former views were erroneous, it seemed to me that the moment I was entrusted with the construction of an experimental line, it became my paramount duty to dismiss every preconceived or controversial opinion, and apply myself to ascertain the method which would afford the cheapest, safest, and quickest means for accomplishing the all-important object of telegraphic communication, totally leaving aside how far the results might establish or refute my previous opinions.

Subterranean system indispensable in certain localities;

and affords great protection from lightning.

16. But, notwithstanding the advantages thus set forth, there are many localities where the subterranean or subaqueous plan is indispensable; for instance, through all populous towns and markets, across rivers too broad to be spanned from masts, and in the immediate vicinity of each corresponding station, where the subterranean position of a portion of the line constitutes the best of all protections from the appalling dangers of the thunder-storms, so incessant and terrific:

terrific for several months of the year in this country; the experience of the month now ending has afforded such evidence as places this fact in the clearest light.

17. Thunder-storms have been more frequent and more violent from the 1st to 26th of March this year than has been the case in any three months for the last 15 years. During these storms, flashes of lightning have repeatedly entered our offices; but no injury has been caused to any individual, and but one instrument has been rendered unserviceable. Unusual frequency and severity of thunder-storms this month.

18. In thus describing, however, the immunity we have enjoyed, I by no means wish to assert that all risk has been obviated. The occupation of a signaller has its perils; so has that of the soldier and sailor; all we can do is to use every precaution which science and experience teach us to adopt.

River-crossing.

19. In paragraph 7 I have described the method by which the Huldee River, 4,200 feet wide, has been successfully crossed, and which is now in course of application to the Hooghly River, 6,200 feet wide, above Diamond Harbour. River-crossings :

20. I have already, in several previous Reports, referred to a great number of experiments made by my assistants and myself on this very important point. Without entering into details too fatiguing for a general reader, I have to state the following facts.

21. The system alluded to in my Report to the Military Board, dated 20th December 1849, consisting in the use of a repeating instrument on each bank of the river, and a naked massive rod across and below the water, was tried with success; but it was found that the repeating instruments required to be attended by skilful and careful assistants, and that, in practice, such derangement occurred as caused very frequent interruptions. This plan was accordingly set aside. With a repeating instrument and naked rod, failed.

22. Again, a method of conveying signals across a broad river without any metallic conductor, using the water itself as the sole vehicle of the electric impulses, was tried, at great labour and at considerable expense, and signals were so conveyed across the Hooghly River in the month of May last, for several days, at the line where the chain is now being placed. But it was ascertained that to correspond by this system required an enormous battery, of at least 300 cells, and that the maintenance and working and current expense of this battery would cause such heavy outlay, and call for the application of such labour and skill, as could not be in practice devoted to any river-crossing. The system was accordingly given up, after full and fair trial. Without metallic conductors; not applicable in practice.

23. Innumerable experiments were subsequently made on iron and copper wire ropes, insulated in different modes, protected by spiral and parallel coatings of iron wire and rods. In these experiments so many failures occurred, that it needed some perseverance to arrive at a successful issue. This has been, I conceive, attained; and I shall describe, with all possible brevity, the system I should now follow in future lines. Different kinds of conductors tried.

24. A copper wire, covered with gutta percha (in England) forms the electric conductor. The wire is but $\frac{1}{16}$ -inch in diameter, so slight that it may be broken by the fingers; the gutta percha coating so soft that it can be cut through with the nail, and, moreover, liable to be (very slowly) acted upon by water. To use this wire, so as to depend on our correspondence being maintained, we must protect the wire itself from all mechanical strains, and its coating from similar injury, and from the chemical agency of the water in which it has to be placed: this latter object I accomplished by covering the gutta percha with a spiral coating of sheet lead, secured closely and firmly by a spiral of tape, saturated with melted wax, applied hot. Experiments, now conducted for 16 months, show that in that time the gutta percha coating of a wire so prepared experiences no change of weight, and undergoes no chemical action of any appreciable amount. Chain-cable system finally adopted.

25. For the mechanical protection of that line I adopt two systems, according to the nature of the river to be crossed, whether tidal and navigable by large vessels, or such as we have to deal with chiefly towards the North-west, nearly dry for a part of the year, and for the remainder only navigated by small craft, using light anchoring tackle.

Experiments on
the Huldee River.

Four lines cut
through by native
boats.

Crossing the
Hooghly River.

Precaution used.

A line to Saugor
recommended
instead of Kedgerree
line.

All materials of
Kedgerree line
available for one
to Saugor.

Great advantage of
Saugor line.

Would be obtained
at a saving of
Rs. 200 a month.

26. The Huldee River is an instance of the first kind across that river. I have laid successively five experimental lines: one, a copper wire insulated with wax and tape; two, an iron wire rope; three, a gutta percha coated wire, undefended; four, a gutta percha covered wire, with defensive coating like that used between Dover and Calais; five, and lastly, a gutta percha covered wire, secured in the angles of a chain cable: of these, the first, second, third, and fourth were cut through by the grapnels of native craft, in periods varying from one to 20 days. The last mode has proved successful. The chain tears away the grapnels which hook it, and the boatmen now give the line a "wide berth."

27. It is almost unnecessary to say that the failure of the four first trials, made chiefly to ascertain how far a guard-boat could be depended upon for the defence of lines not mechanically or self-protected, caused considerable outlay, and gave me much anxiety, but the result now obtained is, I conceive, well worth the previous cost. For all tidal rivers like the Huldee, navigated by native craft, under 100 tons burthen, I conceive the chain system to be completely efficient.

28. How far the plan is applicable to a great river like the Hooghly, navigated by fleets of shipping of all tonnage, to 1,600 tons and more, and by heavy native craft, not under European officers, especially in the only locality where there is a chance of maintaining the line intact, remains to be decided by actual trial. That trial is now in progress.

29. A chain of $\frac{1}{4}$ -inch iron cable is being laid across, under the able management of Mr. Wickham, the assistant harbour-master, by whom the chain was placed across the Huldee. The bed of the river being soft mud, the chain will, doubtless, sink in many places, so as to be below the reach of anchors when dragged across the line; but in some places it may not settle to this depth; and emergencies will arise in which ships must drag their anchors, and endanger the continuity of the chain.

30. To guard against this as far as practicable, a boat, under a European officer, is stationed on the line; signal guns are fired from the Kookroohattee, when vessels approach it; beacons have been erected at each side of the river; notices have been issued by the marine authorities to the pilot service, and circulated in Bengalli among the native navigators. A semaphore mast is also being erected to carry on the communication with Diamond Harbour in case of casualty to the chain. Despite of all their precautions, this river-crossing must always be a source of anxiety, and a risk of interruption.

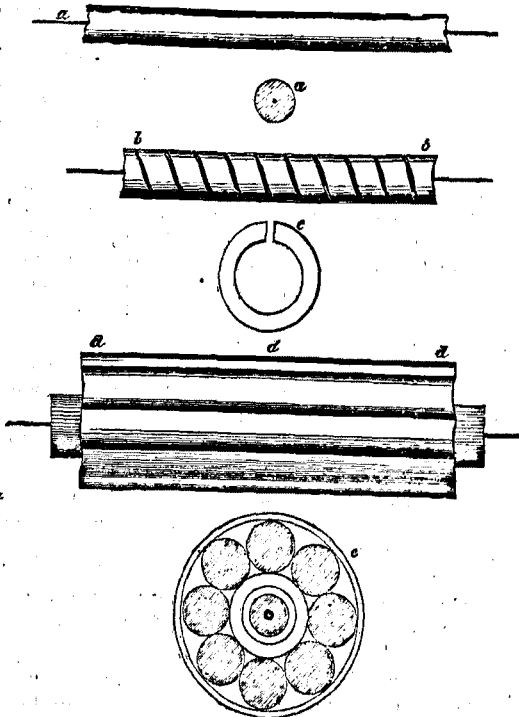
31. I now very much regret that the marine authorities, when duly consulted prior to our selection of a line to the sea, objected to the route *via* Culpie and Saugor to the site of the new lighthouse, which I then wished to follow, and which I believe they would now admit to have very great advantages over the Kedgerree line. It is satisfactory, however, to know, that should the chain fail us, as I believe it will, the whole of the telegraph rods, supports, &c., can be transferred in a few days to the Diamond Harbour side, and may, in a month or six weeks, be erected so as to afford a corresponding station at Culpie, and another at Saugor lighthouse. Culpie is a much-frequented anchorage, is within site of Rungafulla tidal semaphore, in correspondence with which it would transmit reports of great practical value on the depth of water in the critical channels between that station and Kedgerree. An office at Saugor Point would give intelligence of arrivals often two days earlier than Kedgerree, would report vessels in distress, convey orders to outward-bound steamers and shipping, and communicate news and despatches of importance with very much greater facility and certainty than can be accomplished *via* Kedgerree, where inward-bound vessels in the south-western monsoon seldom anchor, and scarcely communicate even their names before their arrival at Diamond Harbour.

32. All these advantages would be gained at a reduction of our present establishment of the guard-boats and officers now entertained for the Hooghly and Huldee River lines, and amounting to about Rs. 200 per month.

33. In the opinion of the best judges, persons familiar with the river and with Saugor, there is no practical difficulty whatever in running the line along the edge of the island. Channel Creek is the only wide water crossing: this is nearly dry at ebb-tide, and is never kedged through. There are several small creeks, but they present no impediment worth dwelling on, as they, as well as Channel

Channel Creek, can be crossed with certainty and ease in the mode I shall now describe.

34. The gutta percha covered wire, *a a*, coated with sheet lead and waxed tape, *b b*, is surrounded transversely with rings cut out of iron wire, as shown in the margin, *c*; parallel to the wire outside the rings are then placed iron rods, each $\frac{3}{8}$ -inch diameter, touching each other, so as to form a bundle like the Roman fasces, *d d d*; the length of these rods is rather greater than that of the river or creek to be crossed; the rods are then secured by transverse loops of iron, *e*.



35. An experimental line of this kind has been tested at the Allipore iron bridge yard by every sort of mechanical trial far more severely than by any impact or strain to which it possibly can be subjected in the rivers or creeks referred to, and has most successfully withstood all attempts to injure it; it is as flexible as a wire-rope of the same diameter.

36. This is the plan I would accordingly follow in Channel Creek, or in the rivers between Calcutta and the North-west, such as the Soane, the Ganges, Jumna, &c., across which it can be placed with ease and certainty. In point of expense, it may be estimated at about Rs. 3,000 for the mile of river.

37. The working of a line to Saugor *vid* Culpie might be depended upon the whole year through as certainly as that of the line between Diamond Harbour and Calcutta is at present. Communication with Kedgerie might be maintained, if thought desirable, by semaphore; but the lumbering inefficiency of the semaphore system gives it but a questionable shade of superiority over the dawk itself. I should not conclude the notice of this subject without alluding to the great value the communication with Saugor would prove of in time of war, in the early receipt of intelligence and orders, and in the possible case of the approach of an enemy's cruisers to the mouth of the river.

Advantage of Saugor line in case of war.

38. I now proceed to consider the working and results of the system of correspondence in use since the offices have been opened for actual business.

39. This took place on the 4th of October, when the junction was completed between the experimental station at Allipore and the new office at Chaudpoul Ghaut, Calcutta. Since that day four offices have been regularly in correspondence; namely, Calcutta, Moyapore, and Diamond Harbour, with a reserve station at Bishtopore; and since the 3d February, two offices, Kedgerie and Kookroohättee, have been open on the Kedgerie line.

System of correspondence on the lines.

40. From the 4th of October till the 5th of December the line was worked and shipping intelligence printed and circulated gratuitously, with the view of satisfying the mercantile community as to the efficiency of the correspondence which could be carried on by its means. This done, the semaphore between Calcutta and Diamond Harbour was abolished on the 5th of December.

Intelligence published four times daily.

No interruptions
on our lines.

41. From that day till this date I am happy to say no interruption whatever has taken place in our correspondence, a result the more important as such interruptions are of very frequent occurrence and long duration on the European lines, where the weather is often blamed for what I believe to be the fault of the instrument and persons employed in the offices.

Night correspond-
ance.

42. Night correspondence has, in a great number of urgent cases, been carried on with a certainty and rapidity which I did not myself anticipate. The signal-boys sleep in the instrument rooms, where an alarm is set; when thoroughly awakened (not an instantaneous operation with a sleepy schoolboy), correspondence proceeds as if by day. As an instance of what has been done in this way, I may adduce a visit by the Superintendent of Marine, Captain Rogers, to the Calcutta office, about 11 P. M., on the night of the 14th February, to learn if the "Phlegethon" steam-vessel had landed the King of Ava's letter at Diamond Harbour: in four minutes the answer was obtained from that station, although all the signallers were in bed and asleep when Captain Rogers came to the office.

King of Ava's
letter.

Confidential mes-
sages freely en-
trusted to our
offices.

43. The degree of confidence reposed in the office by the public is such as to surprise us all: messages on banking business, law matters, opium speculations, domestic concerns, &c., many being of a strictly secret nature, have been entrusted to us; and in no case have I had reason to find fault with our employés for any indiscretion.

44. On one occasion two individuals were, on the same day, sending orders to their agents at Kedgerie, one to arrest a ship, the other to despatch it with all possible speed: neither party could obtain any information as to the despatch sent by the other, although the attempt was made by both to penetrate the secret.

Money receipts.

45. Our pecuniary returns are threefold greater than I anticipated: I stated that Rs. 200 a month might be expected; over Rs. 600 are now constantly realised; and that this amount will be much increased when either the Kedgerie or Saugor line can be depended upon for continuous correspondence, I think cannot admit of reasonable doubt.

Private messages.*

Service messages.†

46. Besides the messages from private individuals, the telegraph is daily had recourse

* December 1851.		<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
Private messages sent and received	- - -	116 13 -	
Subscriptions for circulars	- - -	429 10 6	
			546 7 6
January 1852.			
Private messages sent and received	- - -	257 12 -	
Subscriptions for circulars	- - -	474 9 3	
			732 6 3
February 1852.			
Private messages sent and received	- - -	148 4 -	
Subscriptions for circulars	- - -	488 - -	
			636 4 -
TOTAL		<i>Co.'s Rs.</i>	1,915 - 9

Average of three months - - - - *Rs. 638 5 7*

† December 1851.		<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
Service messages sent and received	- - -	185 15 -	
Circulars at <i>pro forma</i> charge	- - -	96 - -	
			281 15 -
January 1852.			
Service messages sent and received	- - -	301 14 -	
Circulars at <i>pro forma</i> charge	- - -	96 - -	
			397 14 -
February 1852.			
Service messages sent and received	- - -	450 - -	
Circulars at <i>pro forma</i> charge	- - -	96 - -	
			546 - -
TOTAL		<i>Co.'s Rs.</i>	1,228 18 -

Average per month - - - - *Rs. 408 15 -*

recourse to for reports and intelligence, and orders to and from the Marine Department for reports to the superintendent of salt chokies and other public authorities; and the aggregate of such communications, charged, *pro forma*, at the same rate as private messages, shows that the work done by the office is a direct profit to Government, even in this incipient stage of our operations.

47. On the Kedgerie line two stations are maintained, Kookroohattie and Kedgerie; and whenever any despatch of importance is transmitted from Kedgerie, a boat takes it from Kookroohattie to Diamond Harbour. The necessity of this will cease when the chain line is laid across; and it is then more than probable that the Kookroohattie station may be abolished.

48. The establishment entertained to work these lines, with six corresponding offices, required by the exigencies of as many river stations, is composed of the individuals named in the accompanying List (B.), at the salaries specified, in all amounting to Rs. 867.

49. On this establishment* there are many extra hands and probationers entertained, with reference to the exceeding unhealthiness of some of the out-stations, and to protect the public against interruption by misconduct on the part of the lads themselves. Were they to suppose we could not do without them, as would be the case had we barely the number required, it would need but slight temptation to induce them to desert us at critical times, and to trouble us by importunate demands for increase of allowances. With a few extra hands, I can admonish, fine and punish at discretion, and provide for absence through sickness, thereby ensuring efficiency; while, with a smaller number, I could not venture on the system of discipline I now rigorously adopt, nor supply substitutes for those disabled by the fevers which prevail at all the out-stations.

Establishment of signallers required.

Necessity for numerous extra hands on these lines.

50. The proficiency of the youths in correspondence daily improves. Up to this time I prevent the use of abbreviations, and cause each word to be spelt in full, with reference to the youth and inexperience of some of our signallers, and the paramount importance of avoiding mistakes in correspondence; with our senior lads, the rate of signalling and reading now equals that on the English lines; and when I feel myself warranted in permitting the use of abbreviations, our work will equal that of the American offices.

Rate of signalling.

51. I would here advert briefly to certain statements which from time to time astonish the public, respecting the despatch of several hundred words in a minute by means of telegraph machines and electric currents. The thing is possible in two rooms of the same house, or even on an extended line when insulated by absolute dryness of the air, or by the whole of the lines being encased in ice in the depth of an American winter; but the possibility exists only for the work of a few minutes, when these deceitful and complicated instruments are certain to become disordered. We may, I consider, deem ourselves fully efficient if we work in India as well as they do on the great English lines; and this condition I may fairly say we have already attained. I therefore dismiss all considerations of the elaborate toys to which I allude, which, however creditable to the skill of the constructor, are practically but of insignificant value, and most certainly, for reasons to be adduced in another place, can never be made use of on Indian lines.

Fallacious statements regarding rates on other lines.

52. I now proceed to notice, succinctly, the instruments in use in all our stations.

53. I had in 1839 ascertained, by experiments on a very large scale, that to maintain electric correspondence in India would require great modifications in the instruments used elsewhere, owing to the prodigious electric excitement of the atmosphere, of such frequent occurrence, and to many other causes which I have detailed in previous Reports.

Instruments used on our lines.

53 $\frac{1}{2}$. Accordingly,

	Rs.	a.	p.
* Establishment for December 1851 - - - -	829	1	-
Ditto - - for January 1852 - - - -	828	2	3
Ditto - - for February 1852 - - - -	874	10	8
	<hr/>		
	Rs. 2,529	13	11

Necessity for using
simplest possible
instruments.

53. Accordingly, on organising experimental correspondence for our lines, I speedily found that, unless the instruments could be reduced to such a condition of simplicity that when deranged they could be set right by mere schoolboys, and without the aid of a mechanic, regular and sustained correspondence would be totally impracticable.

54. To explain this, it is sufficient to state that, in all our lines running north and south, there is a natural current of electricity continuously flowing; that this current deranges the polarity of our needles, confers permanent polarity on soft iron, and produces chemical stains on prepared tissues: these facts suffice to show to those who have studied this subject, that no matter what instruments we use, whether English, American, or of our own invention, these must be constantly liable to derangement; and this irrespective of the sudden violence of the furious thunder-storms occurring so frequently at particular seasons. It follows, that at each station, if we use complex instruments, we should provide several of them, or at least supply them in duplicate, with a skilful mechanic to take charge of and adjust them, or else we must make instruments of such thoroughly simple forms that our boys can do this for themselves.

55. There being no mechanics out of Calcutta, and here but two skilled in such handicraft, I was driven step by step to discard every screw and lever, and pivot and foot of wire, and frame-work and dial, without which it was practicable to work. I accordingly and successively tried and dismissed the English vertical astatic needle telegraph, the American dotter, and several contrivances of my own invention, most skilfully constructed by Mr. Crible, of Calcutta. Every thunder-storm put the astatic needles *hors de combat*, by deranging the polarity of one or both the needles. The American temporary magnets became permanently polarised, and ceased to actuate the markers. At length, by August 1851, when incessant interruption of this kind had almost driven me to despair, I contrived the little single needle horizontal telegraph, now in use in all our stations, and with which we work in all weathers without danger of interruption. It sometimes becomes disordered, as every instrument must, but it is changed or replaced, or "cured," in a few seconds by the signallers on duty, and if totally destroyed is but the loss of Rs. 3, the cost at which the instrument is made by the boys themselves, including their profit on the construction.

Effects of lightning
at Bistopore station
on 21st March.

56. There is on the table before me, while I write, one of these instruments, which was in use on the evening of the 21st March, Sunday, at the Bistopore station, at half-past 8 P. M., during a terrific north-wester: a flash of lightning struck the line, traversed the instrument, made its wires red-hot, and melted their ends into beads. In less than two minutes, Charles Todd, the signaller on duty, had placed another coil in gear, and reported by telegraph to Calcutta what had taken place in his office.

Alarm apparatus.

57. The same simple apparatus, slightly modified, attached to a "Sam Slick" clock, causes this to ring incessantly by night when an alarm is to be conveyed.

58. The reverser or director, by which the battery currents are transmitted, has equally undergone simplification and improvement in point of solidity and strength, until it now totally differs from any instrument of the kind used elsewhere.

59. A battery of 12 to 20 pieces of platinum wire, with zinc plates, suffices to work our lines and instruments through the heaviest rain and most violent storms.

60. To all our telegraphs and alarms a lightning conductor is attached, of the simplest conceivable construction, by which a flash entering the station will, in nearly all cases, pass off without injury to anything beyond the fusion of the ends of the fine wire of the instrument in use. This lightning conductor is, in principle and construction, totally different from those used elsewhere. I at first employed the kind known as "Walker's" on the English lines, but discarded them as too complex and expensive for use in a country where every thunder-storm would "expend them" in dozens.

Total cost of in-
struments for one
station not Rs. 100.

61. In fine, we can now provide all our stations with complete sets of instruments of every kind, battery, reverser, telegraph, and alarm, with a dozen reserve telegraphs, for less than Rs. 100. I need say nothing to point out the importance

ance of this fact, when we have to provide for the numerous offices which must before long be organised in this country.

62. I have next to show the total expenses incurred up to this time in the construction of the line, distinguishing this specially from the cost of experiments of the training school for pupils, office-rent, furniture, instruments for meteorological observations, maps, books, clocks, erection of bungalows for some out-stations; also setting aside the value of articles lent from the arsenal and naval stores, such as two chain cables, tents, wax powlins, a brass six-pounder gun for signals, a semaphore mast, some meteorological instruments, telescopes, &c.; lastly, stores in hand are taken credit for at cost price. All this duly considered, the accompanying sketch account shows the cost of construction of 11 miles subterranean and 69 miles over-ground line, independent of river crossings, to have amounted to Rs. 36,201. 7. 11., being at the rate of Rs. 452. 8. 3. per mile.

Total expenditure on lines.

63. The detailed accounts* have been submitted to the Military Board up to 31st December 1851, and to the Accountant Government of Bengal to 31st October 1851, leaving only Rs. 6777. 1. 2. unadjusted, of which the accounts are in preparation, and will be sent in as soon as practicable; meanwhile the accompanying statement may be fully depended upon within a margin, which cannot influence any question of importance.

64. It will be remembered that the above result of Rs. 452. 8. 3. per mile, although Rs. 297. 7. 9. below my estimate of Rs. 750 for any line under 100 miles, is still far above what the cost of future single lines will be. Many failures and mistakes have been made and paid for heavily; but they have led to this point, that I am enabled confidently to undertake the construction of future over-ground lines at the rate of Rs. 350 per mile for a single, Rs. 550 for a double line, river crossings and erection of offices being a separate charge.

65. A single line to the North-west or Madras would amply suffice for the transmission of Government despatches; if led through the valley of the Ganges, with offices at all the large cities, a double line would be required for the wants of the community as well as of Government.

Expense of lines to North-west or Madras.

66. From the experience of the home and American systems, I am of opinion that an office or station should be provided at every 100 miles, in order to secure correspondence in all weathers. The cost of each office would average Rs. 500 a month rent, and, current expenses included, say Rs. 5,000 a month, as the cost of correspondence on a line of 1,000 miles.

Offices required in 1,000 miles.

67. I believe that, without clashing with the Government work, the 10 stations thus contemplated would, on the North-west trunk road line, pay a very considerable sum for the transmission of private business, provided the system be adopted of making a low and uniform charge (for each message of 16 words, of two syllables each, one rupee), irrespective of the distance to which the message is sent.

68. With a double line along the valley of the Ganges to Allahabad and *via* Agra to Bombay, at a cost of Rs. 550 per mile, and embracing 25 stations, I consider it beyond all doubt that not only would every expense be paid, but a large net profit be insured.

A double line must yield a large profit.

69. It is not alone the great stations on the line itself, but every place of importance within, say, 100 miles of the line at each side, would be brought within a day's correspondence of all the stations; the two great termini and centre, say Calcutta, Bombay, and Agra, included.

70. On the cost of construction of such great lines, and of providing these with apparatus, the expense of their establishment and working, there can be no uncertainty.

	Rs.	a.	p.
* Received from the General Treasury	51,507	1	6
Ditto by sale of materials, &c.	1,029	3	1
	52,535	4	9
Accounts submitted to the Military Board	45,768	3	7
	Rs. 6,777	1	2

uncertainty. The Diamond Harbour and Kedgerree lines have answered every question of this kind. The time required for construction has been rendered equally certain. Allowed eight months for importation and collection of materials, their distribution on the line, and all other preliminary arrangements, three or even five miles a day could be easily constructed from the commencement of operations.

71. But to ensure the economy and despatch above described, iron rods and such material must be procured in the English market, not at the ruinous and extortionate rates which prevail in Calcutta whenever purchases are made on Government account.

72. Having already, in my letters of the 10th and 13th February, adverted to my own position in connexion with the experiments and the construction of the lines now in operation, and referring to these letters for the discussion of many matters with which I am unwilling to encumber this Report, I have, in conclusion, to solicit the indulgent consideration of Government for such imperfections as they may deem to exist in the results of my experiments. I have never been in a telegraph office elsewhere, and I have had no one to refer to here for advice in any doubtful case. Whatever has been done has, moreover, been accomplished in the hours snatched with difficulty from the laborious duties of the Assay Office, in which I well knew that not even the semblance of the slightest remissness would be passed over without severe animadversion by the Mint committee.

I have, &c.

(signed) W. B. O'Shaughnessy,
Superintendent Electric Telegraph.

Calcutta, Electric Telegraph Office,
30 March 1852.

(True copies.)

(signed) J. W. Dalrymple,
Under-Secretary to Government of Bengal.

MINUTE by the Most Noble the Governor of Bengal.

Electric telegraph
in Bengal.

1. DR. W. O'SHAUGHNESSY has submitted his last Report, announcing the completion of the line of electric telegraph from Calcutta to Kedgerree. In all its parts, as well as in that portion of the line which is carried under-ground as in that which is conducted, after the European manner, on posts, its success has been complete. Neither the heat nor the rains, neither the violent atmospheric influences, nor the thunder-storms and hurricanes to which it has been exposed during the past twelvemonth, in a degree which will probably never be exceeded, have interrupted the full and continuous working of the line. Even the more difficult object of carrying the wire in safety across the Hooghly, where it is so liable to injury by the shipping, appears to have been fully accomplished. A mechanism and a system, both admirable for their simplicity, and therefore doubly valuable in India, and under the circumstances in which the telegraph will be worked, have been devised and brought into operation. An establishment of young lads has been trained, and has conducted the duties hitherto with regularity, and to the satisfaction of the Government and of the public.

Financially, the experiment may be regarded as quite successful. The monthly charge amounts to Rs. 925, while the receipts from private parties exceed Rs. 916; leaving the whole of the Government correspondence conducted almost without charge.

In like manner it appears from Dr. O'Shaughnessy's letters that the entire line, 80 miles in length, has been constructed for a sum lower than the estimate by Rs. 13,000.

2. I have visited the line, and, in common with hundreds of others, can bear testimony to the beautiful simplicity of the work, to the regularity of its operations, and to the perfect success of it as a national experiment of the highest and

and most immediate moment to the interests of India. In truth, the best of all testimony is borne to it by the periodical delivery every three hours during each day of intelligence from each station between Calcutta and Kedgerie, up to the hour at which the intelligence is delivered here in Calcutta.

3. These are admirable and most valuable results; and I believe I am doing no more than expressing the universal opinion of the community when I say, that for them the Government of India is indebted to the ability, the undaunted energy, the perseverance and skill of Dr. W. O'Shaughnessy. He has accomplished the whole, unaided, within a comparatively short time, in the midst of other imperative duties, and without any remuneration whatever.

4. I am of opinion that for these things Dr. O'Shaughnessy deserves the highest approbation and substantial proofs of the gratitude of the Government he has served so well.

If it were in my power, as Governor of Bengal, to confer upon Dr. O'Shaughnessy a reward adequate to his claims, I should hasten to do so at once; but adverting to what I conceive to be the immense value of the success which he has achieved, to the economy with which he has worked, to the anxiety and responsibility of his task, and to the absence of all remuneration since he commenced his labours, I consider him to be entitled to a richer acknowledgment than I am competent to bestow.

I beg leave, therefore, in the most earnest language, to recommend to the Government of India, that it should direct to be paid to Dr. O'Shaughnessy, for what he has already accomplished in the success of the experimental line, the sum of Rs.20,000.

5. The complete success of the experimental line has added intensity to the ardent desire I have entertained, ever since the first report on the subject was submitted, to see the main line of electric telegraph between Calcutta and Peshawur, Bombay and Calcutta, Madras and Calcutta, fairly commenced before I quit India next year.

6. The vast advantages of such a communication, if feasible, are apparent at a glance. The experimental line has shown not only that it is feasible, but that it may be made easy of accomplishment, rapid in execution, cheap of construction, and profitable in its returns.

7. If additional proof of its political value were required, it would be found in recent events, when the existence of an electric telegraph would have gained for us days when even hours were precious, instead of being dependent for the conveyance of a material portion of our orders upon the poor pace of a dāk foot-runner.

8. Since, then, the early establishment of the electric telegraph is all-important alike to the Government and to the community in India; since it has been shown to be practicable, safe, cheap and profitable, I entreat the Government of India to second with all its authority my most urgent solicitation to the Honourable Court of Directors, that they will authorise the immediate construction of a line or lines from Calcutta to Agra, to Bombay, to Peshawur, and to Madras, either simultaneously, or as soon as possible, in the order in which they are placed in my list.

9. Relying confidently on the acquiescence of the Government of India in this request, I would beg to offer some suggestions for expediting the submission of the question to the Court, and for giving effect to its consent, which I am satisfied will not be withheld, so soon as the Court shall be convinced of the correctness of the results we are now about to lay before them.

Everything, all the world over, moves faster now-a-days than it used to do, except the transactions of Indian business.

What with the numbers of functionaries, boards, references, correspondences, and several governments in India; what with the distance, the reference for further information made from England, the fresh correspondences arising from that reference, and the consultations of the several authorities in England, the progress of any great public measure, even when all are equally disposed to promote it, is often discouragingly slow.

10. In the present instance, the inconveniences usually felt in this country have been obviated by causing Dr. O'Shaughnessy to communicate direct with the

the Government of Bengal: his Report of the completion of the line has thus been considered by the local government without delay, and I trust it will be speedily forwarded to the Court by the Government of India.

11. I am very desirous of endeavouring to expedite and facilitate its consideration by the authorities in England.

To that end I beg leave respectfully to recommend to the Governor-general in Council, that Dr. O'Shaughnessy should be directed to proceed to England at once, simultaneously with the transmission of the Report.

His presence will enable him to give every information to the Honourable Court respecting the system he has established, and its operation. His accounts will enable the Court to test the estimates for the extension of these lines, by examination of past expenditure. All necessity for references to India will be removed, and the Court will be in a condition to pronounce its decision at once.

12. I have already stated, that I cannot doubt that the decision of the Court will sanction the work. In that case Dr. O'Shaughnessy's presence in England will be of great additional value. With the sanction and under the directions of the Court, he will be able to direct the preparation of materials for the electric line on very favourable terms, and with that speed and in those quantities which alone will lead to a speedy establishment of the whole line. This could not be effected in India.

13. As I cannot doubt that, if the line be carried on, the past services of Dr. O'Shaughnessy will entitle him, in the eyes of the Government, to be selected for the superintendence of the larger work, his visit to England will be further valuable by giving him the opportunity of becoming acquainted with the English, the continental, and even the American systems and modes of construction; for it is not the least part of Dr. O'Shaughnessy's merits that he has never seen an electric telegraph line, though he has so successfully constructed one, and contrived its organisation.

14. Dr. O'Shaughnessy, if he be allowed to proceed to England, cannot, by the rules, be permitted to retain his office or his salary; but I trust the Government of India will not hesitate to take upon itself the responsibility of assuring Dr. O'Shaughnessy, that they will use all their efforts to ensure that he will not, during his absence, or on his return, be subjected to any pecuniary loss by his mission.

15. Heartily commending this matter to the favourable consideration of the Governor-general in Council, I trust that it will meet with an early assent.

(signed) *Dalhousie.*

14 April 1852.

(A true copy.)

(signed) J. W. Dalrymple,
Under-Secretary to the Government of Bengal.

Copy PUBLIC LETTER to the Governor-General of India in Council.—No. 26.

LETTER from, in Home Department, No. 22, dated
23 April 1852.

Forwarding a Report from the Government of Bengal, announcing the completion by Dr. W. B. O'Shaughnessy of the line of electric telegraph from Calcutta to Kedgerree; together with a Minute by the most Honourable the Governor, stating that, in acknowledgment of the services of that officer, he has been presented with the sum of Rs. 20,000. That with the view of commencing a scheme of electric telegraphs for India, which the Court are requested to sanction, Dr. O'Shaughnessy, to whom it is proposed to entrust the superintendence, will be directed to proceed to Europe for the purpose of submitting to the Court every information that may be needed, and of making himself acquainted with the various systems which prevail.

Para. 1. We have observed with much interest the progress of the experimental line of telegraph at your Presidency, and now receive with true satisfaction the account of its successful termination, under the superintendence of W. B. O'Shaughnessy.

2. We entirely approve of the manner in which you have testified your sense of the merits and services of Dr. O'Shaughnessy, who gratuitously devoted much time and attention to the execution of the work, and has now brought it to a successful issue; and of the remuneration of Rs. 20,000 which you have assigned to him.

3. Concurring

3. Concurring, also, in your view of the desirableness of commencing lines of electric telegraph to connect the different seats of Government, we shall be prepared, in view to the early accomplishment of that object, to give our serious consideration to the propositions which Dr. O'Shaughnessy may lay before us.

(signed)	<i>J. W. Hogg.</i>	<i>W. Dent.</i>
	<i>C. Mills.</i>	<i>J. P. Muspratt.</i>
	<i>J. L. Lushington.</i>	<i>H. Shank.</i>
	<i>J. Cotton.</i>	<i>M. T. Smith.</i>
	<i>E. Macnaghten.</i>	<i>H. Willock.</i>
	<i>R. D. Mangles.</i>	<i>W. J. Eastwick.</i>
	<i>W. H. C. Plowden.</i>	<i>J. A. Moore.</i>
	<i>J. H. Astell.</i>	

London, 23 June 1852.

Copy PUBLIC LETTER to the Governor-General of India in Council.—No. 38.

Para. 1. WITH reference to our despatch in this department, dated the 23d June 1852, intimating to you our intention to take into consideration the subject of introducing a system of electric telegraph into India, we have to inform you that upon the arrival of Dr. O'Shaughnessy in this country, we maturely considered propositions which, at our request, that officer submitted to us for the purpose.

2. We at once determined to take measures for the immediate provision of the materials required to be sent from this country for the construction of 3,150 miles of electric telegraph in India, to connect the various seats of Government, the three Presidencies, the North Western Provinces, and the Punjab.

3. These materials have been ordered, and in the course of a short time their transmission to India will commence.

4. Having called upon Dr. O'Shaughnessy to state his views as to the measures which should be taken for the distribution of the materials as they arrive in India, we forward for your information copy of his letter upon the subject.

5. We desire that you will take the subject into your immediate consideration, in view to making such preliminary arrangements as you may think proper.

6. The precise route of the lines we leave for your decision.

7. You will communicate to the Governments of Madras and Bombay your determination upon the above questions, in order that no delay may occur in the simultaneous commencement of the work.

8. Measures are in progress for the instruction, under the superintendence of Dr. O'Shaughnessy, of certain of our recruits in the art of constructing and working the electric telegraph.

9. We would direct your attention to the observations of Dr. O'Shaughnessy upon the preservation of the articles as they arrive in India.

We are, &c.

(signed)	<i>J. W. Hogg.</i>	<i>J. C. Whiteman.</i>
	<i>R. Ellice.</i>	<i>J. Masterman.</i>
	<i>J. Loch.</i>	<i>W. Dent.</i>
	<i>J. L. Lushington.</i>	<i>H. Willock.</i>
	<i>W. B. Bayley.</i>	<i>J. A. Moore.</i>
	<i>E. Macnaghten.</i>	<i>J. Cotton.</i>
	<i>J. H. Astell.</i>	<i>W. J. Eastwick.</i>

London, 20 October 1852.

Copy LETTER in the Home Department, No. 70, of 1852.

To the Honourable the Court of Directors of the East India Company.

Honourable Sirs,

We have the honour to acknowledge the receipt of your despatch, dated the 20th of October last, No. 38, with its enclosure from Dr. O'Shaughnessy, respecting the construction of the electric telegraph in India to connect the various seats of Government and the Punjab, and to forward herewith copy of a Minute which has been recorded on the subject by the Governor-general, together with copies of the communications which have this day been made to the Governments of Madras, Bombay, and the North-west Provinces.

Home Cons.
22 December 1852,
Nos. 14 to 18.

We have, &c.,
(signed) *Dalhousie.*
F. Currie.
J. Lewis,
W. R. Gilbert.

Fort William, 29 December 1852.

MINUTE by the Most Noble the Governor-General.

Electric telegraph.

1. THE Court of Directors has addressed the Government of India, intimating that materials for 3,150 miles of electric telegraph will shortly be despatched from England, and inclosing a letter from Dr. O'Shaughnessy, regarding the preparations to be at once commenced in India.

A perusal of the letter will show that a determination of the several lines to be formed, is an indispensable preliminary to the commencement of any preparations whatever.

2. In the Minute recorded as Governor of Bengal on 14th April 1852, I advised the immediate construction of "lines from Calcutta to Agra, to Bombay, to Peshawur, and to Madras, either simultaneously or as soon as possible, in the order in which they are placed in my list."

P 8.

The Honourable Court are prepared to construct them simultaneously. It therefore remains only to decide the general direction of the several lines.

3. Rapid communication with the head-quarters of the Supreme Government for public and political purposes from all the presidencies, but most especially from the Presidency of Bengal, where political events are most likely to occur, is manifestly the first consideration for the Government of India. A similar facility of communication for commercial objects is of hardly less moment. It so happens, that upon the principal lines of communication I have named, these two objects can be attained simultaneously.

4. A line of electric telegraph, uniting Calcutta with Benares, Allahabad, Agra, Umballa, Lahore, and Peshawur, will touch every locality in which the occurrence of political events is at all likely. It will enable the Supreme Government to obtain the earliest intelligence of any such occurrence, and within a few hours to make known the orders those events may require at the extremest post of the western frontier. In like manner the several local authorities will be able to act with the same promptitude as if they were upon the spot, and will find their power proportionately increased.

5. The same line that confers these political advantages upon the Governments will enable the mercantile community at Calcutta to correspond with equal facility with all those districts of Hindostan from which the main body of their trade proceeds. As the line will be carried to Benares, the communication would be sufficiently close for all convenience with Mirzapore, the great entrepôt of the trade of the Saugor and Nerbudda provinces; but it will probably be found preferable to carry the line up the right bank of the Ganges through Mirzapore itself; if not, a very short branch will anywhere connect it with the main line. Thence on its way onwards to the several points I have mentioned, it will traverse the plain of Hindostan, touch upon Oude, skirt Rohilcund, and be at no distance anywhere from the principal points towards which the export and import trades now tend.

For

For these reasons I am of opinion that the line I have indicated should receive the earliest and closest attention.

6. The more immediate necessities of the Government and of the community having thus been provided for, I apprehend that the next line of importance would be one from Calcutta to Bombay. By means of it will be secured the earliest information of a political and commercial nature from Europe; and, in like manner, the latest tidings of all events will be given from hence to England.

A very large portion of this line will be supplied by the line first mentioned.

It will be a matter for consideration whether the portion from Bombay should join the other line at Agra, following the present great road through Malwa, or whether it should be carried through the valley of the Nerbudda. As at present advised, I apprehend that the line through the Rajpoot States and the territories of Holkar would be the more advantageous one, both politically and commercially.

7. A third line would still be required for communication with Madras. I am disposed to revise my former opinion, so far as to recommend that, in the first instance at least, there should not be formed a direct line between Calcutta and Madras, but that a line from Bombay to Madras should be substituted for it. Political and commercial information from Europe is of course valuable at Madras, and it would be given by the line I propose. It is true that it could be given (though more slowly) round by Calcutta, if a line were to be made thence to Madras; but by the other line it would be given direct and rapidly, while greater aggregate benefit would be obtained by it. On the course which it would follow between Madras and Calcutta there is not a single place of political or commercial consequence, nor is there one military station of importance.

On the other hand, a line from Madras to Bombay, taking Bangalore, Bellary, Poonah, and perhaps Hyderabad in its course, would not only give rapid communication to Madras with England through Bombay, but would give ready communication both to Madras and Bombay, as well as to the Supreme Government, with the great military stations I have named.

No doubt if Calcutta had to communicate with Madras through Bombay, it would do so less rapidly than by a line direct to Madras. But since the communications of the electric telegraph are measured by minutes instead of by days, the delay thus created between Calcutta and Madras is not of appreciable importance, and certainly should not be allowed to weigh against the advantages, political, military, and commercial, which would accrue, especially to Madras, and the economy which would be obtained by following the plan I have now suggested.

8. With respect to the particular lines to be followed, I conceive there can be no doubt that, as regards the Presidency of Bengal, the electric telegraph should follow the course of the great trunk road from Calcutta to Peshawur, as a general rule.

That road generally forms the shortest line of communication. Its existence will facilitate the conveyance of the materials for the construction of the telegraph. The villages everywhere along it will remove all difficulty as to the supplies for the people employed; and when the line shall be completed, the police with which the trunk road is furnished will protect the line of telegraph while they protect the road, without any additional labour to them, or cost to the State.

A branch line should be taken off from it to the important commercial town of Patna, passing through the large military station of Dinapore on its way.

A branch, in like manner, should be carried to Meerut.

9. The Lieutenant-governor of the North-western Provinces and the Government of Bombay should be consulted regarding the line from Bombay to Bengal.

The Government of Bombay and the Government of Madras should be consulted regarding the line between Madras and Bombay.

Until replies to these references shall be received, I think it would be premature to call for the precise information pointed out by Dr. O'Shaughnessy.

10. If my honourable colleagues concur in these views, I would request the secretary to prepare letters to the Lieutenant-governor, the Government of Bombay, and the Government of Madras.

11. The letter to the Lieutenant-governor should be founded on paras. 1, '2, 3, 4, 5, 6, 8 of this minute. His views on the line to be followed in the Bengal Presidency, and the line to be constructed to Bombay in communication with it, should be requested, and his remarks and suggestions invited. An early reply should be solicited.

12. The Government of Bombay should be informed that the Court of Directors having sanctioned the formation of lines of electric telegraph, the several lines are now to be determined. Acquaint them that the Supreme Government proposes to commence at once the construction of a line from Calcutta to the western frontier. A line of communication between Calcutta and Bombay is of great importance, and the Government of India desires to commence it simultaneously with the other. The lower portion of the trunk line will obviously be best made common to both lines. The question for determination is, whether the portion from Bombay should join the trunk line at Agra by way of Indore, &c., or lower down by way of the valley of the Nerbudda.

As at present advised, and having regard to the political and military advantages which would be obtained by carrying the line through Malwa, and along the present great line of road, the Government of India is disposed to prefer the line by Agra. Upon this point the opinion of the Government of Bombay is requested.

It is proposed also to form a line from Bombay to Madras, connecting, if possible, the stations of Poonah, Bellary, and Bangalore in its course.

The Government of Bombay is requested to report, as early as possible, whether this can be effected; whether Hyderabad could be included; and if so, whether it should be on the main line, or connected by a branch. Generally the Government of Bombay is requested to give its opinion on the best line of communication for an electric telegraph between Madras and Bombay, so as to ensure as much as possible of political, military, and commercial benefit. The Government of Bombay should be particularly requested to state whether the line they may recommend would be carried along an existing line of road.

13. The Government of Madras should be informed that it is proposed to connect Calcutta and Bombay by a line or lines of electric telegraph. To extend the communication to Madras, and to connect it also with Calcutta, it appears to the Governor-general in Council to be expedient, in the first instance at least, to construct a line from Bombay to Madras, for the following reasons. The reasons should then be stated, as given in this minute, from the words "Political and commercial information," in para. 7, to the end of that paragraph.

The Government of Madras should then be requested to favour the Government of India with its opinion, as early as possible, whether this line can be constructed; and generally, what would be the best line of communication between Madras and Calcutta, so as to ensure the greatest amount of political, military, and commercial advantage.

The Government of Madras should be particularly requested to state whether the line they may suggest would be carried along an existing line of road.

16 December 1852.

(signed) *Dalhousie.*

I concur.

(signed) *F. Currie.*

I concur.

(signed) *J. Lewis.*

I concur.

(signed) *W. R. Gilbert.*

No. 1021.—Home Department.

From *J. P. Grant*, Esq., Secretary to the Government of India, to the Secretary to the Government of Fort St. George.

Sir,

I AM directed by the most Noble the Governor-general of India in Council to transmit to you, to be laid before the Right honourable the Governor in Council, the accompanying copy of a despatch from the Honourable Court of Directors, dated 20th of October last, No. 38, in which the Honourable Court intimate that materials for 3,150 miles of electric telegraph will shortly be despatched from England, and with which they send a letter from Dr. O'Shaughnessy, regarding the preparations to be at once commenced in India.

2. It will be seen that the determination of the general direction of the several lines to be formed, is an indispensable preliminary to the commencement of any preparations whatever.

3. The Governor-general in Council had recommended the immediate construction of lines from Calcutta to Agra, to Bombay, to Peshawur, and to Madras, either simultaneously or as soon as possible, in the order in which the places are named.

4. The Honourable Court are prepared to construct these lines simultaneously. It therefore remains only to decide upon the general direction of the several lines.

5. Communications on this subject, so far as the North-western Provinces and Bombay are concerned, have been made this day to the governments of those provinces. In respect to the Madras Provinces, I am directed to inform the Governor of Madras in Council, that the method of connecting Madras with the system, which the Governor-general of India in Council now feels disposed to adopt, in the first instance at least, is to construct a line from Bombay to Madras.

6. Political and commercial information from Europe, which is, of course, as valuable at Madras as elsewhere, will be given directly by the line proposed; such information could undoubtedly be given, though more slowly, round by Calcutta, if a line were to be constructed thence to Madras. But by the other line it would be given direct and rapidly, while greater aggregate benefit would be obtained by it. On the course which it would follow between Madras and Calcutta, there are no places of political or great commercial consequence, and no military stations of great importance. On the other hand, a line from Madras to Bombay, taking Bangalore, Bellary, and Poonah, and perhaps Hyderabad in its course, would not only give rapid communication to Madras with England through Bombay, but would give ready communication both to Madras and Bombay, as well as to the Supreme Government with the great military stations named. There is no doubt that if Calcutta had to communicate with Madras through Bombay, it would do so less rapidly than by a line direct to Madras. But since the communications of the electric telegraph are measured by minutes instead of days, the delay thus created between Calcutta and Madras is not of appreciable importance, and certainly should not be allowed to weigh against the advantages, political, military, and commercial, which would accrue, especially to Madras, and the economy which would be obtained by following the plan suggested.

7. The Governor-general in Council requests that the Government of Madras will favour him with its opinion, as early as possible, as to whether the proposed line can be constructed, and whether Hyderabad could be included; and, if so, whether it should be in the main line or connected by a branch line; also generally the Government of Madras is requested to say what, in its opinion, would be the best line of communication between Madras and Calcutta, so as to ensure the greatest amount of political, military, and commercial advantage.

His

His Lordship in Council requests particularly the Madras Government to mention whether the line they may suggest would be carried along an existing line of road.

Fort William,
22 December 1852.

I have, &c.
(signed) *J. P. Grant*,
Secretary to Government of India.

No. 1022.—Home Department.

From *J. P. Grant, Esq.*, Secretary to Government of India, to the Secretary to the Government of Bombay.

Sir,

I AM directed by the most Noble the Governor-general of India in Council to transmit to you, to be laid before the Right honourable the Governor in Council, the accompanying copy of a despatch from the Honourable Court of Directors, dated 20th October last (No. 38), in which the Honourable Court intimate that materials for 3,150 miles of electric telegraph will shortly be despatched from England, and with which they send a letter from Dr. O'Shaughnessy regarding the preparations to be at once commenced in India.

2. It will be seen that the determination of the general direction of the several lines to be formed is an indispensable preliminary to the commencement of any preparation whatever.

3. The Governor-general in Council had recommended the immediate construction of lines from Calcutta to Agra, to Bombay, to Peshawur, and to Madras, either simultaneously or as soon as possible, in the order in which the places are named.

4. The Honourable Court are prepared to construct these lines simultaneously. It therefore remains only to decide upon the general direction of the several lines.

5. The Governor-general in Council proposes to commence at once the construction of a line from Calcutta to the western frontier. A communication has accordingly this day been made to the Government of the North-west Provinces on the line to be followed in the Bengal Presidency, and the line to be constructed to Bombay in communication with it.

The Governor-general in Council attaches great importance to the line of communication between Calcutta and Bombay, and he is therefore desirous that this line should be commenced simultaneously with the line from Calcutta to the North-west Provinces.

6. A very large portion of the Calcutta and Bombay line will be supplied by the Calcutta and Peshawur line; and the question for consideration is, whether the branch from Bombay should join the trunk line at Agra, following the present great road through Malwa, by way of Indore, or whether it should be carried lower down, by way of the valley of the Nerbudda.

7. As at present advised, and having regard to the political and military advantages which would be obtained by carrying the line through Malwa and along the present great line of road, the Governor-general in Council is disposed to prefer the line by Agra. Upon this point, however, his Lordship in Council requests the opinion of the Government of Bombay as early as possible.

8. It is proposed, also, to form a line from Bombay to Madras, connecting the stations of Poonah, Bellary, and Bangalore in its course; and on this head a communication has been made to the Government of Madras. The Governor-general in Council will be glad to be favoured with the opinions of the Bombay Government as to whether the object can be effected; whether Hyderabad could be included; and, if so, whether it should be on the main line or connected by a branch line. Generally, the Government of Bombay is requested to

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to give his opinion on the best line of communication for an electric telegraph between Madras and Bombay, so as to ensure as much as possible of political, military, and commercial benefit; and particularly whether the line which may be recommended would be carried along an existing line of road.

Fort William,
23 December 1852.

I have, &c.
(signed) *J. P. Grant,*
Secretary to the Government of India.

No. 1020.—Home Department.

From *J. P. Grant, Esq.,* Secretary to the Government of India, to *W. Muir, Esq.,*
Secretary to the Government of the North-West Provinces.

Sir,

I AM directed by the most Noble the Governor-general of India in Council to transmit to you, to be laid before the Honourable the Lieutenant-governor, the accompanying copy of a despatch from the Honourable the Court of Directors, dated 20 October last, No. 34, in which the Honourable Court intimate that materials for 3,150 miles of electric telegraph will shortly be despatched from England, and with which they send a letter from Dr. O'Shaughnessy regarding the preparations to be at once commenced in India.

2. It will be seen that the determination of the general direction of the several lines to be formed is an indispensable preliminary to the commencement of any preparations whatever.

3. The Governor-general in Council had recommended the immediate construction of lines from Calcutta to Agra, to Bombay, to Peshawar, and to Madras, either simultaneously, or as soon as possible, in the order in which the places are named.

4. The Honourable Court are prepared to construct the line simultaneously. It, therefore, remains only to decide upon the general direction of the several lines.

5. Rapid communication with the head-quarters of the Supreme Government for public and political purposes from all the Provinces, but most especially from the Presidency of Bengal, where political events are most likely to occur, is manifestly the first consideration for the Government of India. A similar facility of communication for commercial objects is of hardly less moment. It so happens that upon the principal lines of communication named these two objects can be attained simultaneously.

6. A line of electric telegraph uniting Calcutta with Benares, Allahabad, Agra, Umballa, Lahore, and Peshawar, will touch every locality in which the occurrence of political events is at all likely. It will enable the Supreme Government to obtain the earliest intelligence of any such occurrence, and within a few hours to make known the orders those events may require at the extreme part of the western frontier. In like manner, the several local authorities will be able to act with the same promptitude as if they were on the spot, and will find their powers proportionately increased.

7. The same line that confers these political advantages upon the Government will enable the mercantile community at Calcutta to correspond with equal facility with all those districts of Hindostan from which the main body of their trade proceeds. As the line will be carried to Benares, the communication would be sufficiently close for all convenience with Mirzapore, the great entrepot of the trade of the Bangor and North-West Provinces. But it will probably be found preferable to carry the line up the right bank of the Ganges, through Mirzapore itself. If not, a very short branch will nevertheless connect it with the main line. Thence, on its way onwards to the several points mentioned, it will traverse the plain of Hindostan, touch upon Delhi, short Rohilkund, and be at no distance anywhere from the principal points towards which the export and import trades now tend. For these reasons the Governor-general in Council

is of opinion that the line indicated should receive the earliest and closest attention.

8. The more immediate necessities of the Government and of the community having thus been provided for, the Governor-general in Council apprehends that the next line of importance would be one from Calcutta to Bombay. By means of it will be secured the earliest information of a political and commercial nature from Europe, and in like manner the latest tidings of all events will be given from hence to England.

9. A very large portion of this line will be supplied by the line first mentioned.

It will be a matter for consideration whether the portion from Bombay should join the other line at Agra, following the present great road through Malwa, or whether it should be carried through the valley of the Nerbudda. As at present advised, the Governor-general in Council apprehends that the line through the Rajpoot States and the territories of Holkar would be the more advantageous one, both politically and commercially.

10. With respect to the particular lines to be followed, the Governor-general in Council conceives there can be no doubt that, as regards the Presidency of Bengal, the electric telegraph should follow the course of the great trunk road from Calcutta to Peshawur, as a general rule.

11. That road generally forms the shortest line of communication. Its existence will facilitate the conveyance of the materials for the construction of the telegraph. The villages everywhere along it will remove all difficulty as to the supplies for the people employed; and when the line shall be completed, the police with which the trunk road is furnished will protect the line of telegraph while they protect the road, without any additional labour to them or cost to the State. A branch line should be taken off from it to the important commercial town of Patna, passing through the large military station of Dinapore on its way. A branch, in like manner, should be carried to Meerut.

12. The Governor-general in Council will be glad to receive, as early as possible, any remarks and suggestions which his Honor the Lieutenant-governor may desire to offer in connexion with the above expression of his views on the line to be followed in the Bengal Presidency and the line to be constructed to Bombay in communication with it.

13. The opinion of the Bombay Government has been invited on the line which is to connect that Presidency *vid* Agra with Calcutta.

Fort William,
22 December 1852.

I have, &c.
(signed) J. P. Grant,
Secretary to the Government of India.

Copy PUBLIC DESPATCH to the Governor-General of India in Council.
No. 22.

Electric telegraph
establishment.

1. WE forward, (No. in the packet,) copy of a letter from Dr. W. B. O'Shaughnessy, regarding the establishment which it may be necessary to maintain under your Government, and under those of the subordinate Presidencies, for the superintendence, management, and working of the electric telegraphs throughout India.

2. We commit the subject to your attentive consideration, and desire to be furnished with your views, both as to the extent of the establishment required and to the remuneration of the different grades.

3. We have no doubt that you will concur with us in recognising the pretensions of Dr. O'Shaughnessy to the office of superintendent; and we feel assured that he will continue to display the same energy, zeal, and knowledge which he has hitherto exhibited in the introduction of electric telegraphs into India. We leave the arrangement of his salary and allowances to your Government, subject to our approval.

4. With

4. With reference to the various questions involved in the formation of the establishment, we abstain from any expression of opinion, further than remarking that we are disposed to concur in the view taken by Dr. O'Shaughnessy, as to the expediency of procuring as few hands as possible from this country, and of preserving this new branch of employment distinct from all other services.

5. Sixty men from our recruiting establishment at Warley have been instructed as artificers upon the short experimental line which was constructed in this country; 40 of these are now on their way to your Presidency, per ship "Gloriosa"; 12 will proceed to Madras, and eight to Bombay.

6. Mr. Browne, who has likewise been employed at Warley, and who has not only become fully acquainted with the construction and working of the telegraph lines, but has also rendered valuable aid in instructing the men under his charge, accompanies the detachment to Calcutta. We request that you will provide suitable employment for him on the electric telegraph establishments, and grant such pay and allowances to him as you may deem proper; pending our decision upon the propositions you may submit to us regarding the establishment to be entertained.

7. Dr. O'Shaughnessy will so regulate his departure from this country as to arrive at your Presidency in July, which will afford time to make every necessary arrangement for the commencement of operations at the beginning of the cold season.

8. He has been fully employed, while absent from India, in superintending the supply of the requisite materials, as well as in applying them experimentally to the purposes for which they are intended; also in procuring information from every available source in this country and on the continent of Europe, regarding the various modes of constructing and working electric telegraphs.

9. This information he has embodied in a manual, which will contain also full and precise practical instructions for the use of those who may be employed in the construction of the Indian lines.

London,
27 April 1853.

We are, &c.
(signed) *Russell Ellice,*
J. Oliphant,
&c. &c.

Copy LETTER in the Home Department.—No. 37, of 1853.

To the Honourable the Court of Directors of the East India Company.

Honourable Sirs,

IN continuation of our despatch, No. 70, dated 29th December last, we have the honour to transmit the accompanying reports which have been received from the several local Governments, on the subject of the proposed lines of electric telegraph to connect the various seats of Government in India, together with a minute recorded by the Governor-general, dated 7th ultimo, and the letters which have been addressed to the Governments of Madras, Bombay, Bengal, and Agra, definitively settling the lines to be constructed, and directing preparations to be made accordingly.

Home Department,
10 June 1853.
Home Cons.
20 May 1853,
Nos. 8 to 21.
Home Cons.
10 June 1853.

Fort William,
10 June 1853.

We have, &c.
(signed) *Dalhousie.*
J. Lewis.
J. Dorin.

No. 18.—Public Department.

From Sir *H. C. Montgomery*, Bart., Chief Secretary to Government of Fort St. George, to *J. P. Grant*, Esq., Secretary to the Government of India.

Home Cons.
20 May 1853,
No. 8.

Sir,

I AM directed to acknowledge the receipt of your letter, No. 1021, dated 22d December last, enclosing copy of a despatch from the Honourable Court, regarding the introduction of the electric telegraph into India, and requesting the opinion of this Government as to the most expedient method of connecting this

this Presidency with the general system of lines projected by the most Noble the Governor-general in Council.

2. In reply, I am instructed to state, that the Right Honourable the Governor in Council concurs in the views of the Government of India, that the most advisable course to adopt in the first instance is to connect Madras with Bombay.

3. The Governor in Council would suggest that the line should proceed by Bangalore, Bellary, Hyderabad, Sholapoor and Poonah, to Bombay, making an aggregate distance of about 1,050 miles.*

4. The construction of this line would not be attended with any difficulty; throughout its length it would pass along existing roads, and towards Bangalore it might hereafter follow the course of the railway about to be commenced.

5. The Governor in Council considers it highly desirable that Hyderabad should be included in the main line, as he concludes it is politically of great importance that that place should be in direct communication both with Madras and Bombay, and also with the neighbouring cantonment of Bellary. The additional distance consequently, on including Hyderabad, would be only about 200 miles.

Secunderabad to
Kamptee, via
Nuzvid route.

6. If the line between Bombay and Calcutta should pass through Nagpore, it will be seen that a short line of 323 miles from Kamptee to Secunderabad would bring Madras and Hyderabad into more direct connexion with Calcutta, and perfect the communications of this Government with those important military stations occupied by the Madras troops.

7. After a very careful consideration of the subject, the Governor in Council is of opinion that the line above indicated, viz., from Madras to Bombay, by Bangalore, Bellary, Secunderabad, and Sholapore, with a branch from Secunderabad to Nagpore, is undoubtedly the most important, both as regards the interests of this Presidency, and as part of the system for the Empire generally, that it should be laid down first, but he trusts that at no distant period a direct line between Madras and Calcutta, by the existing coast road, passing through the military stations of Masulipatam, Vizagapatam, and the neighbouring seaports, Coringa, Bimlipatam, and Munsoorcottah, will also be carried out as a national measure, the importance of which is not to be estimated by merely pecuniary consideration.

8. Information regarding the line to Bombay, as far as Sholapore, as is above proposed, including also the branch from Secunderabad to Nagpore, will be found in the accompanying Sketch Maps, † prepared by the quartermaster-general; and in a copy of the Road Book just published, such further information as is at present attainable, will be found regarding the size of towns and villages, the passage and size of ghauts and rivers, and the general features of the country.

9. I am directed to add, that this Government is fully sensible of the incalculable importance of this great national undertaking, and to convey an assurance of its cordial and energetic co-operation in the measures the most Noble the Governor-general in Council may determine for adoption.

I have, &c.
(signed) *H. C. Montgomery,*
Chief Secretary.

Fort St. George,
24 February 1853.

	<i>Miles.</i>
• Madras to Bangalore - - - - -	208
Bangalore to Bellary, <i>vide</i> accompanying Sketch, No. 2 - - -	184
Bellary to Secunderabad, <i>vide</i> accompanying Sketch, No. 3 - - -	216
Secunderabad to Sholapore, <i>vide</i> accompanying Sketch, No. 5 - - -	197
Sholapore to Poonah - - - - -	157
Poonah to Bombay - - - - -	94
	1,056

† *Note.*—For the purposes of general reference, a Sketch Map, exhibiting the Lines of the Electric Telegraph, completed to 31st December 1854, is appended at the end of this Return.

No. 705 of 1853.—General Department.

From the Secretary to the Government of Bombay to the Secretary to the
Government of India.

Home Cons.
20 May 1853.
No. 9.

Sir,

I AM directed to acknowledge the receipt of your letter, dated the 22d December last, No. 1022, with its enclosures, on the subject of the introduction of system of electric telegraph into India.

2. It is intimated in this letter that the most Noble the Governor-general has decided, 1st, that there shall be a line of wire connecting Bombay and Calcutta; 2d, that this line shall somewhere join the main Trunk Line from Calcutta to Peshawur; 3d, that Bombay shall also be connected with Madras; and the opinion of this Government is required as to the direction which these lines should take.

3. Before replying to your letter, the Right honourable the Governor in Council thought it desirable to consult the authorities indicated in the margin*, as being best qualified from their official position to give an opinion on the important subject. I enclose copies of the replies which have been elicited by this reference.

4. It will be seen that all parties are agreed on the line of direction which should be followed between Bombay and Madras. It is advised that the line should pass through Poona, Sattara, Kalapoor, Belgaum, and Dharwar to Madras, *via* Bellary and Bangalore, &c.

5. The Right honourable the Governor in Council concurs in this opinion, and as it would appear from the 8th para. of your letter, that the views of the Supreme Government on this point are coincident, the direction of the Bombay and Madras line, in so far as this Presidency is concerned, may probably be considered as decided.

6. It has further been recommended that this line should be connected at Bellary or Rajamundry, by a branch line with Hyderabad; his Lordship in Council approves of this suggestion, but the subject seems one rather for the consideration of the Government of Madras than for that of Bombay.

7. In regard to the line from Calcutta to Bombay, it is recommended by all that it should join the Grand Trunk Line at Agra. Further, all are agreed that the line from Agra should pass through Gwalior to Indore.

8. There is, however, a marked difference of opinion as to the line to be prepared from Indore to Bombay. Mr. Hamilton,† who is supported by the Military Board, advocates a line connecting the following towns, and exceeding the direct line in distance by more than 140 miles.

From Indore to Mundlaisud, Asseerghur, Boorhanpoor, Aurungabad, Ahmednuggur, Seroor, Poona, and Panwell.

9. The Commander-in-chief, the Quartermaster-general, and the Postmaster-general, on the other hand, advise that the direct high road and postal line be followed, that is, by Nassick, Mulligaum, Dhoolia, and Mhow.

10. Mr. Hamilton is influenced by the apparent importance of connecting commercial towns and European stations, and of securing efficient superintendence at convenient distances.

11. The Military Board, though they concur with Mr. Hamilton, have not overlooked a serious objection to his plan, as they correctly observe the greater length of the line is of comparatively little consequence as far as regards rapidity of communication, but the increased risk of interruption attending a lengthened line is a decided disadvantage.

12. The

* His Excellency the Commander-in-Chief, the Military Board, the Quartermaster-General, and the Postmaster-General.

† *Vide* the letter addressed by him to the Government of India, under date 16th August last, No. 85, para. 6.

12. The Board also notice that a portion of the proposed line is at right angles to the proper line of direction, though that portion of the line would, if this suggestion were adopted, be included in the line from Madras to Bombay.

13. The authorities who advocate a straight line of direction, point out that many large towns and military stations will also be connected, should their advice be followed, and that the line will have the further advantage of keeping to a well-known tract, a considerable portion of which is likely hereafter to become a railroad, thus affording facilities for first laying down the telegraph and afterwards keeping it in repair.

14. Mr. Hamilton's proposal has been more particularly replied to in the Quartermaster-general's memorandum, which merits attention, and in which it appears to this Government that officer disposes satisfactorily of the reasons which induce the Resident at Indore to prefer the more circuitous route.

15. It only remains to state that the opinion of this Government is strongly in favour of the direct line, and for these reasons.

16. The Right honourable the Governor in Council will not insist on the circumstance, that the shorter line affords nearly equal facilities for superintendence at convenient distances as the longer one; and that the traffic of the commercial towns enumerated by Mr. Hamilton is now carried by this very line to Bombay.

17. But, as the Quartermaster-general has not failed to notice, a great portion of this line will follow the selected line of railroad.

18. And on this his Lordship would observe, 1st, that as long as it follows the line of railroad, the chances of interruption will be infinitely less, as well as the facilities of repairing the telegraph greater than where there is a distinct and separate line; 2d, the superintendence will be cheaper and more efficient, since the establishment for the rail must necessarily serve in a measure even though not especially charged with the duty to protect the wires.

19. Further, an electric telegraph is the natural adjunct and auxiliary of the rail, which it will employ to a great extent, not alone for its own purposes of trade and commerce.

20. For as the rail will become the central line for traffic in every district through which it passes, the results which have happened elsewhere must necessarily follow here. Old towns may not be abandoned, but there can be no doubt that new ones will arise in its vicinity.

21. The facility with which short diverging lines of wire can be laid down from the main line to the principal towns and stations in its neighbourhood must also be kept in view. Thus, the Madras telegraph will pass along the diverging line of rail to Poona, which city it will thus connect with the Presidency, or should the railway company abandon the Bhoré Ghaut and Poona line, which there is little reason to expect, the wire would cross the country by a short direct line above the Thull Ghaut to Poona.

22. Another material consideration in favour of the direct line is, that it avoids the difficulty incidental to the line recommended by Mr. Hamilton, of carrying the wire from Panwell to Bombay. To connect Bombay and Panwell it would be necessary, if the land route be followed, to make a very considerable detour *vid* Tanna, at right angles to the proper course. If, on the other hand, it were thought preferable to effect a direct communication with Bombay by submarine telegraph, the nearest point on the main land is Oolwa Bunder, and from thence the distance is 12 miles, through an arm of the sea, shallow, and crowded with shipping and boats, which anchor in all parts of it.

23. Upon the whole, therefore, the Right honourable the Governor in Council would decidedly recommend the more direct, which is the most commercial and important line, in preference to a more circuitous route, which has only local and temporary expediency in its favour.

I have, &c.

(signed) J. G. Lumsden,

Secretary to Government.

3 March 1853.

No. 198.

From the Secretary to the Government of Bengal to the Secretary to the Government of India, Home Department.

Home Cons.
20 May 1853.
No. 11.

Sir,

I AM directed by the most Noble the Governor of Bengal to acknowledge the receipt of your letter, No. 71, dated the 28th January last, transmitting, for the information of this Government, copies of letters which have been addressed by the Government of India to the Government of Fort St. George, Bombay, and the North-western Provinces, on the subject of the preliminary arrangements for the construction of the electric telegraph in India, and to communicate the following observations in reply.

2. In paragraphs 10 and 11 of your letter to the Secretary to the Government, North-western Provinces, No. 1020, dated 22d December, it is assumed, that as regards the lower provinces of Bengal Presidency, the electric telegraph should follow the course of the Grand Trunk Road from Calcutta to Benares, with a branch line to Patna and Dinapore. It appears, however, to his Lordship that there is much to be said in favour of another line, which ought not to be overlooked when the whole question comes under the consideration of the Governor-general of India in Council, viz. a line following the direction of the East Indian Railway, as far as the line is determined, and its probable direction from that point to Benares.

3. The two lines, that is to say, the Grand Trunk Road line, and the East Indian Railway line, are coincident to a point about 10 miles beyond Burdwan, where the East Indian Railway diverges at nearly a right angle, and takes the direction of Rajmehal, from whence its course will probably be along the river bank, in a well-cultivated and thickly peopled country, through the civil and military stations of Bhangulpore, Monghyr, Patna, Dinapore, Arrah, and Buxar.

4. The Grand Trunk Road from the same point goes almost in a direct line to Benares, but without passing through one civil or military station, and for more than one half of the distance is barren and hilly country.

5. The advantages which may be supposed to attend the laying of the electric telegraph along the line of the Grand Trunk Road, are

First. That distance is saved, and consequently expense of construction.

Second. That the line passes within 60 miles of the head-quarters of the Ramgurbh Battalion, and comparatively near the hill country of the Colehan and Boud.

Third. That there already exists a police force to guard the line.

6. The first advantage appears to his Lordship a trifling one; for, on the one hand, the distance from Calcutta to Benares is 420, and from Shergotty to Dinapore 88 miles, making a total of 508 miles; while, on the other hand, the distance from Calcutta to Dinapore by the river or railway route, is 376, and from Dinapore to Benares 145 miles, making altogether 521. The advantage, therefore, in point of distance gained by following the line of the Grand Trunk Road is only 13 miles.

7. The second advantage, in his Lordship's opinion, is neutralized to a considerable extent by the circumstance, that the line by the river route passes through the head-quarters of the Bhangulpore Hill Rangers, and within 30 miles of the large military station of Berhampore.

8. In respect to the third advantage, all that can be said is that no special police force is found necessary to guard the line of electric telegraph between Calcutta and Kedgerree; that the people are not disposed to injure the electric telegraph wantonly; that they have nothing, or very little to gain by injuring it, and that detection would almost certainly and immediately follow. When the railway is open, the railway police will guard the electric telegraph, and till then it needs no further guard than the ordinary village police of the country, and the staff that must be maintained to keep it in order, even if it were to follow the line of the Grand Trunk Road.

9. The advantages of following the river line, his Lordship observes, are manifold :

First. That the progress upwards and downwards of all Government and private steamers, and all public and private boats, can be made instantaneously known at Calcutta or at any point along the line, and immediate means taken to remedy the effect of any accident.

Second. That the railway company will be saved the necessity of constructing a separate electric telegraph (which they must otherwise have), and the Government, consequently, will neither have to guarantee interest at 4 or 5 per cent. on the additional outlay, nor be exposed to competition from a rival establishment. Even if a second line should be found necessary for the purposes of the railway, it will be much less expensive to lay an additional rod, or wire, on posts already erected, than to establish an independent line.

Third. That the Government will be in instantaneous communication with the head-quarters of the local regiment at Bhangulpore, and in very close communication with the force at Berhampore, and that the line will pass through four, and comparatively near five civil stations.

Fourth. That the time occupied in communicating to and from Calcutta with Eastern Nepal, Sikhim, Bhootan, Assam, and the whole North-east Frontier, will be reduced, on an average, by one-half.

Fifth. That messages will be more frequent from all points along the line of railway and river, and the profits of the telegraph consequently increased.

Sixth. That the materials for constructing the electric telegraph along the River Line may be conveyed by water to any point of the line above Rajmehal, at a trifling cost, and also to certain points between Rajmehal and Burdwan, by means of the Rivers More and Adjee.

Seventh. That the important commercial intercourse between Calcutta and the districts to the north of the Ganges will be greatly facilitated, whereas no commercial interests of any consequence will be served by following the other line.

10. These considerations seem to his Lordship to deserve serious attention before the line of the Grand Trunk Road from Burdwan to Benares is absolutely determined on. It may be objected, that as the telegraph will most likely be set up along the whole line before the extension of the railway beyond Rajmehal is undertaken, there may be inconvenience in fixing the posts and wires along a probable line of railway, which may not turn out to be the real line, and having to remove them afterwards; but this objection does not appear to his Lordship of much weight. The line of railroad along the right bank of the Ganges has been pretty accurately indicated by Major Baker and Mr. Turnbull, and as it is not absolutely necessary that the telegraph should touch the line of railway except at the railway stations, the alterations that may eventually have to be made in the direction of the telegraph can be but trifling, and the necessity for making such alterations, must, under any circumstances, be an inconvenience of infinitely less magnitude than that of having to construct two lines of telegraph, one along the Grand Trunk Road, and the other along the railway, both of which would virtually have to be constructed at the public expense, but the less profitable of which only would be worked for the benefit of Government.

11. These are the views which his Lordship on consideration of the subject would recommend the Government of India to adopt, and his Lordship has only to add, that if the electric telegraph follows the line of railway, it should nowhere approach the rails nearer than the extreme limit of the lands permanently or temporarily taken for the railway.

Fort William,
15 March 1853.

I have, &c.
(signed) Cecil Beadon,
Secretary to the Government of Bengal.

No. 249.

From the Officiating Superintendent Electric Telegraph to Cecil Beadon,
Esq., c. s., Secretary to the Government of Bengal.

Home Cons.
30 May 1853,
No. 12.

Sir,

As the season is fast approaching for the commencement of the projected line of telegraph, and as we are in a great measure ignorant of the difficulties which lie before us on the road, in the shape of creeks, villages, rice fields, &c., I deem it my duty to suggest the advisability of despatching a person up the intended route for the purpose of obtaining a rough survey, and a general idea of the nature of the country through which the line will have to pass.

2. Independent of the necessity which exists for information on the above points, the distribution of materials, both in quality and quantity, will depend much upon the nature of the country; and therefore, setting aside the value of the information of a rough survey of the ground actually to be traversed by the telegraph, it will materially assist us in the calculations to be made, having reference to the description and quantity of material necessary to be laid down, prior to the commencement of the work, on the different sections of the line.

3. Dr. O'Shaughnessy, fully alive to the importance of the step I have the honour to propose, has, in his letter to me, strongly urged its adoption, and recommends, in case the proposal receives the favourable consideration of the Government, that the present inspector of the telegraph, Baboo Seeb Chunder Nundy (a gentleman fully qualified in every respect for the duty) be despatched with instructions to make a survey of the proposed route from Calcutta to Agra.

4. Should the Government be pleased to sanction the above step being taken, I would respectfully suggest that Baboo Seeb Chunder be allowed, in addition to his present salary, the usual travelling expenses granted to persons of his rank employed on revenue surveys.

5. Baboo Seeb Chunder Nundy's duties can be performed during his absence by the temporary promotion of one of the assistants in the department.

I have, &c.

(signed) F. G. Siddons,
Officiating Superintendent E. T.

Calcutta,
31 March 1853.

No. 229.

COPY forwarded to the Home Department of the Government of India, in continuation of the Letter from this Office (No. 198); dated 15th instant.

By Order of the most Noble the Governor of Bengal,

(signed) W. G. Young,

Officiating Under-Secretary to the Government
of Bengal.

Fort William,
31 March 1853.

NOTE.

THE answers of all the Governments to the letters written to them respecting the lines which the electric telegraph should take have been received.

Home Cons.
30 May 1853,
No. 15.
Electric telegraph

BENGAL.

The Government of India assumed that the line through Bengal should run along the Grand Trunk Road to Benares. But on considering the question again in Bengal, the most Noble the Governor has represented that there is much to be said in favour of another line, which ought not to be overlooked; namely, a line following the direction of the railway to Rajmehal, and thence following its probable direction towards Benares. His Lordship's leaning is in favour of this line.

The idea is to make this Government line of telegraph serve also for the railway, and to pass it through a country where it will be much more useful than

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than in the unpeopled tracts through which a long stretch of the Grand Trunk Road runs. The arguments in favour of the river line are fully and forcibly stated in the letter from the Bengal Government, dated the 15th March last.

There is no doubt that the river line is infinitely the better of the two for all local objects, and though 100 miles longer than the direct line, it is not much longer than the direct line would be if a branch were added to it to reach Dinapore and Patna.

But as the whole question is now to come before Government for final consideration, and the subject is one of great importance, the secretary will not be blamed for respectfully submitting some points in favour of the direct line originally proposed, which seem to him of weight sufficient still to leave an opening for discussion.

It may perhaps be questioned whether the experience of the Kedgeree line is sufficient quite to take away all force from the consideration of the security from robbery afforded by the police on the Grand Trunk Road. It will be observed that the Lieutenant-governor of the North-western Provinces lays great stress upon this point. Iron is valuable booty in India. There is a story of a large cannon having been stolen at Cooly Bazar by a pack of thieves, who were never discovered.

It may be assumed, probably, that the railway, as a single line, must have a telegraph. The question then arises, will one and the same telegraph line between Benares and Calcutta do both for the Government and the railway? This portion of the line will be by far the most important, and most used portion of all the telegraph lines in India, for by it will come the whole communications of the State, and of private persons between Calcutta and the Punjab, the North-western Provinces, Bombay, Madras, and Central India. It is the stem of the whole tree. Can Government allow such a trunk line to be in any respect out of its own control and management? Is it not of the essence of a national telegraph that it shall be absolutely, and always in the power of Government? On the other hand, can the railway company safely work the corresponding portion of the railway, which also is a grand trunk, without having an electric telegraph at its own absolute command? The telegraph line for the railway must be arranged, not only for "through" communication, but for direct communication with grand stations, and communications between every stopping place on the line. The Government telegraph line will require but one rod or wire, being arranged only for communication between the great towns or stations, where there will be Government offices, and ground batteries. This consideration seems to lead to the probable conclusion that wherever Government runs its line, the railway must have its own line to itself, or if not its own line of posts, at least its own lines of wires, and its own telegraph offices and batteries.

If so, all the advantages of the river line, as a Government line, and all the disadvantages of the direct line disappear; for the railway telegraph, of which, of course, both Government and the public will be allowed to avail themselves, subject to the necessary priority reserved for objects of railway management, will answer well enough every local object between Calcutta and Benares, and it will render a branch to Dinapore and Patna unnecessary.

The railway company have no right to expect Government to go out of its way, and to put itself to expenses in order to supply the railway with any part of its necessary furniture. Now, it would put Government to a great expense to arrange its telegraph so as to suit the purpose of the railway company, even supposing the railway company to pay for its own additional wires, batteries, and offices; for, although a line of telegraph for railway purposes need not throughout run close alongside of the rails, and indeed it is better that it should not do so, it must pass through or close to every railway station, and as the precise line of railway will not be known beyond Rajmehal for some time to come, and the telegraph posts must keep clear of all works in progress, it would seem impossible to avoid the expense of taking up and replacing a great part of the line on the completion of the railway. These considerations, and that of the great increase of distance by the river line, lead to the conclusion that the river line would cost Government an extra half lac of rupees; whilst, if the direct line be adopted, two tracts of country will get eventually the local benefit of a telegraph, instead of only one, and all communication between the metropolis and distant parts of India will be expedited.

It is not meant, however, here to argue, that if the lines of wire, batteries, offices,

offices, and officers of Government and the railway are distinct, there is any essential objection to the line of posts being in common. It is only meant to submit whether Government should not have absolute and perpetual dominion over one telegraph system, and if so, whether the advantage of using a common line of posts is important.

However this question is determined, it may probably be thought well to make the Government line run through Barrackpore.

When the Governor-general in Council determines finally this question of the line, it will be necessary to consider the recommendation of Dr. O'Shaughnessy to despatch Baboo Seeb Chunder Nundy, the inspector of the telegraph, along the line, to ascertain the nature of all the difficulties that exist in the shape of creeks, villages, rice fields, &c., and after a rough survey, to report generally on the nature of the country through which the line will pass. It is to be observed, however, that if the Grand Trunk Road be followed, there will be no difficulties in the whole line, excepting the few great unbridged rivers.

AGRA.

The Lieutenant-Governor of the North-western Provinces concurs with the Governor-general in Council, in thinking that the Grand Trunk Road at present undoubtedly affords the greatest facilities for the line of electric telegraph. He says, "It is direct, level, well bridged wherever practicable, and above all has maintained upon it a constant and vigilant watch and ward." And he shows how from it branches can easily be sent off to Goruckpore and Nepal, Nagpore and Hyderabad, Lucknow, Bundelcund, Rohilcund, Agra, Mussowrie, and Ajmere. He observes, however, that it does not always touch the places of greatest importance; touching Benares, Allahabad, Cawnpore, and Delhi, but not touching Mirzapore, Agra, Furruckabad, and Meerut. He says, it is for those familiar with the subject to decide whether it is better, in certain cases, to deviate from the line in order to touch an important place, or to send off a branch to that place.

The Lieutenant-governor sends up a letter from Colonel Cautley, expressing an opinion of the necessity of having an electric telegraph for the special purposes of the Ganges Canal, in the upper part.

Maps, obtained from the Military Department, of the distribution of the armies of the three Presidencies accompany this note. From an inspection of the Bengal map, it will be seen that the following line would hit a remarkable number of important military stations and large commercial marts, and would miss astonishingly few, whilst its deviations from a direct line are, on the whole, immaterial: The only decided deflection from a straight line is for 44 miles, between Delhi and Meerut.

	Number of Miles from last Station, according to Route Book and Polymetrical Table.	Number of Miles from Calcutta by line of Electric Telegraph.	Number of Miles from Calcutta by direct Road, according to Polymetrical Table.	Number of Regiments at the Station, according to the Bengal Army List, printed in January 1853.	D. Divisional Head-quarters Station. B. The Head-quarters of a Brigadier.
Benares	-	428	428	3	B.
Mirzapore	27	455	455	1	
Allahabad	61	516	498	2	D.
Cawnpore	129	645	628	4	B.
Agra	179	824	796	3 ½	
Muttra	35	859	818	1	B.
Delhi	98	957	900	3	D.
Meerut	44	1,001	906	5	D.
Umballa	127	1,128	1,033	5 ½	
Loodiana	70	1,198	1,103	1 ½	B.
Jullundar	213	1,411	1,316	5	
Umritsur	56	1,467	1,260	2	D.
Lahore	34	1,501	1,226	7	
Wuzerabad	60	1,561	1,266	3	
Jeelum	41	1,602	1,327	3	B.
Rawul Pindee	93	1,695	1,420	4	
Attock	37	1,732	1,457	"	D.
Peshawur	42	1,774	1,499	10	

The columns opposite the places named in the above table, show the road distance from place to place, the distance from Calcutta by the line of electric telegraph suggested, reckoning the distance to Benares by the Grand Trunk Road, the direct road distance of each place named from Calcutta, and the number of regiments stationed at the place named. The letter D. denotes a divisional head-quarter station, and the letter B. denotes the head-quarters of a brigadier.

The only places missed, where more than a single regiment is stationed, are—

	No. of Regiments.
Lucknow - - - - -	3
Bareilly - - - - -	2
Ferozepore - - - - -	4
Hoshearapore - - - - -	3½
Sealkote - - - - -	5

By this line of telegraph, including Barrackpore, the Governor-general could, in about an hour's time, put 70,614 men under arms at the stations through which the line passes, or 75,854 men, including Bhagulpore and Dinapore, on the Bengal River Line.

The line hits the great centres of trade quite as effectually as the great military cantonments.

BOMBAY.

In this memorandum, the line between Bombay and Bengal only will be mentioned under this head, leaving the line between Madras and Bombay for the head of Madras.

Some of the Bombay authorities seem to regret that Bombay and Calcutta are not to be connected by a direct line. They do not seem to admit that for political and military objects, if two places are merely included in the system, it does not matter anything how indirectly the electric current may be driven between them, or that even between two places holding much commercial intercourse with each other, it matters not whether the electric current travels along the arc or the chord of a segment of a circle, nor do they seem to recognise the principle that in an imperial view the problem to be solved is, how to include in the system the greatest possible number of important places with the least possible aggregate length of line.

All are agreed that, assuming the object to be to connect Bombay with the Calcutta and Peshawur line, the Bombay line should branch off from the Bengal line at Agra, and thence run through Gwalior to Mhow. This line lies along a great highway, and there will be probably no question about the direction so far.

From Mhow, the Bombay Government decidedly recommend that the line should continue along the same high road, through Dhoolia, Mulligaum, Nassick, and Tannah, to Bombay. The Bombay commander-in-chief, quartermaster-general, and postmaster-general, also prefer this line. But Mr. Hamilton, the Resident of Indore, and the Bombay Military Board, prefer a line from Indore, which would run to Poonah instead of Bombay, touching on its way Mundlaiser, Boorhampore, Aurungabad, and Ahmednuggur, the last of which places is an important military station, and the two first are important towns.

The Bombay authorities treat this line as if it were equivalent to 140 miles of additional telegraph, because by it the whole distance from Agra to Bombay is prolonged by that number of miles; but this is a fallacy. It matters not whether Poonah or Bombay be reached, as there will be certainly an independent line from Bombay through Poonah to Madras. Deducting 82, the distance in miles between Bombay and Poonah, from 140, the true additional length of Mr. Hamilton's line is only 58 miles. It is unquestionably the better line in respect to the places it touches, as it passes one considerable military station, Admednuggur, whilst the other line passes none; and it passes several more important towns than the other line. But, on the other hand, the other line is upon a great high road, along which at present the traffic of these towns passes; which, perhaps, may be considered by the Government of India, as by the Bombay Government, decisive in its favour. It lies also through our own territories, which Mr.

Hamilton's

Hamilton's line does not. And moreover, not only Ahmednuggur, but the important military station of Jaulnah also would be nearly provided for otherwise, by a branch line from Nagpore to Poonah, which is little longer than the shortest possible line, by which Nagpore can be brought into the system. The Madras Government regard telegraphic communication with Nagpore as an object of importance.

Below is given a tabular statement of the line recommended by the Bombay Government, similar to the one above given for the North-western Provinces. This line does not show very well, in respect to the great military stations it passes, but the most Noble the Governor-general has remarked upon its political importance.

	Number of Miles from last Station, according to Route Book.	Number of Miles from Agra by Line of Electric Telegraph.	Number of Miles from Agra by direct Road, according to Polymetrical Table and Route Book.	Number of Regiments at the Station, according to Bombay Army List, printed in April 1853.	D. Divisional Head-quarters Station. B. The Head-quarters of a Brigadier.
Agra - - - -	—	—	—	—	
Gwalior - - -	71.	71	71	4	B.
Goonah - - -	139	210	198	1	
Mhow - - - -	195	405	394	2	
Mulligaum - -	173	578	566	1	
Nassick - - -	70	648	636	—	
Tannah - - -	94	742	730	1 ½	
Bombay - - -	24	766	754	3 ½	B.

MADRAS.

The Madras Government agree as to the propriety of making no direct line from Madras to Calcutta, in the first instance, but they express a hope that such a line, running along the coast, may be made eventually.

The way they propose for connecting Madras with Bombay is by Bangalore, Bellary, Hyderabad, Kholapore, and Poonah, making a line 1,056 miles long. The Bombay Government, and all the authorities at Bombay, whilst they suggest the same line between Madras and Bellary, unanimously recommend that from Bellary the line shall run through Darwar, Belgaum, Kolapore, and Sattara, to Poonah and Bombay, with a branch line from Bellary to Hyderabad. This part of the line is especially a Bombay question. The line proposed at Madras would almost wholly miss the southern division of the Bombay army, taking in one station with one regiment, namely, Sholapore, to leave out four stations with six regiments and a civil corps, namely, Dharwar, Belgaum, Kolapore, and Sattarah. The one line would run for several hundred miles through foreign territory, whilst the other, in its main stem, would run wholly through territories which are our own, or, for this purpose, the same as our own; and the line recommended at Bombay, including the branch to Hyderabad, is hardly, if at all, longer than that recommended at Madras. In every point of comparison, therefore, the line proposed at Bombay has a vast advantage over the other.

The Madras Government considered it highly important to include Hyderabad in the main line; but every object will be served by including it in the system by means of a branch to Bellary.

The Madras Government suggested a branch of 323 miles between Hyderabad and Nagpore; but it has been above submitted whether, as the line would be quite useless, except inasmuch as it would bring Nagpore into the system, a branch not much more than a third part longer, from Poonah through Ahmednuggur and Jaulnah, would not be preferable.

Below is a Table of the Madras line, on the principle of the other Tables above given :

	Number of Miles from last Station, according to Map and Route Book.	Number of Miles from Bombay by Line of Electric Telegraph.	Number of Miles from Bombay by direct Road, according to Polymetrical Table and Route Book.	Number of Regiments at the Station, according to the Madras and Bombay Army Lists, printed in April 1853.	D. Divisional Head-quarters Station, B. The Head-quarters of a Brigadier.
Bombay - - -	—	—	—	—	
Poonah - - -	92	92	94	4	D
Sattarah - - -	73	165	163	1	
Kolapore - - -	70	235	233	1	
Belgaum - - -	82	317	318	3	D
Dharwar - - -	47	364	351	1	
Bellary - - -	147	511	446	2	B
Bangalore - - -	184	695	609	3 ½	D
Vellore - - -	128	823	737	1	
Arcot - - -	14	837	751	1	
Madras - - -	71	908	821	4 ½	D

Branch from Bellary to Hyderabad - - - 225 miles.

GENERAL.

The following are the lengths of the lines of telegraph above described :—

Calcutta to Agra - - -	824
Agra to Peshawur - - -	950
Agra to Bombay - - -	766
Bombay to Madras' - - -	908

TOTAL - - - 3,448

Add, Branch from Bellary to Hyderabad - - - 225

GRAND TOTAL - - - 3,673

Materials for 3,150 miles have been ordered at home, and of these a part has arrived.

To perfect the imperial system, about 1,200 miles more would be requisite to include Jessore, Dacca, Chittagong, Arracan, Pegu, and Tenasserim. At Dr. O'Shaughnessy's estimate of Rs. 350 a mile, this would cost Rs. 420,000 more.

As soon as the most Noble the Governor-general in Council has determined on the general direction of the lines in each Presidency, it will be necessary to instruct the several local Governments to procure the detailed information required by Dr. O'Shaughnessy, to take measures towards the distribution of the stores at certain grand depôts along the lines, in the quantities proposed by that officer, and to prepare the requisite number of wooden posts. Arracan has been found unable to supply more than 8,000 iron-wood posts, which Dr. O'Shaughnessy prefers to all others. The whole number of posts required is estimated at 50,000.

5 May 1853.

(signed) J. P. Grant,
Secretary to the Government of India.

Home Cons.
20 May 1853,
No. 16.
Electric telegraph
for India.

MINUTE by the Most Noble the Governor-General, concurred in by the Honourable J. Lewis.

1. ANSWERS having been received from the several Presidencies to the questions that were asked by the Supreme Government regarding the best direction for lines of electric telegraph throughout India, the subject is ripe for decision, and should be decided without delay.

2. In replying to the question, as Governor of Bengal, I have thought it right to submit to the Supreme Government considerations which appeared to be worthy

worthy of attention, that were advanced in favour of carrying the line of telegraph along the railway, rather than along the Trunk Road, as I had suggested.

3. It has been urged in favour of this view : 1st., that experience on the existing line has shown that it does not stand in need of protection by the police ; 2d, that the telegraph would be common to the Government and to the railway company, and would thus serve the purposes of both, thereby reducing the cost and expenses of the railway, in which the Government has a direct interest ; 3d, that it would not be much longer than the line by the Trunk Road ; 4th, that it would afford a greater amount of communication, military, civil, and commercial ; 5th, that it gets rid of a competitor to the Government telegraph, which the railway telegraph would otherwise become.

4. On the other hand, it has been urged in favour of the direct line, 1st, that the public interests require that the Government line should be under the control and management of Government ; 2d, that the railway must have a telegraph line of its own, and that consequently little would be saved in the way of expense.

5. Upon mature consideration of the several views entertained by the Supreme and by the local Governments, I am of opinion that the conclusion I originally expressed was the correct one, and that the line ought to go by the Great Trunk Road.

6. The security of the line from Calcutta to Kedgeree is not conclusive proof that the line would be equally free from depredators or evil-disposed persons in the thinly-peopled districts of Behar, or the North-western Provinces. It will be seen that the Lieutenant-Governor lays great stress on this consideration ; and I think that the presence of police at regular distances, and always patrolling at night along that line, is a strong argument in favour of carrying the electric telegraph wires in close proximity to it.

7. Second. I consider it to be quite necessary that the railway, especially as being a single line, should have an electric telegraph ; but the more obvious that necessity, the stronger would be the objections to the railway being dependent on the Government wires and establishment for its power of internal communication. The Government wires on the lower portions will carry the whole communications of India ; its occupation, it is believed, would be constant ; but many communications along a railway require to be immediate, if they are to be of any value at all ; either then that immediate communication for the internal wants of the railway will be rendered uncertain, or the official communication of the Government, and the commercial and personal communication of the public, must be liable to be abruptly interrupted ; therefore the railway must have a wire, and batteries, and establishment of its own ; moreover, it must have signalling establishments of its own at its intermediate stations ; for the Government establishments need only be entertained at points of importance. Hence it appears that all the expense that would be saved by making one telegraph along the railway line would be the cost of the posts on which the wires are carried.

8. Third. I apprehend it would be considerably longer than the direct line, because if there be a railway telegraph there would be no occasion for a branch from the Government line to Dinapore, which would at once cause a saving of 80 miles of wire, &c.

9. There is no doubt that it would serve many purposes, civil, military, and commercial, which the direct line would leave unprovided for ; but none of these purposes are of any very great intrinsic importance ; besides they will all be provided for if the railway has a telegraph, and the Government chooses to permit its use in some degree.

10. For, 4thly, there is no need that a telegraph along the railway line should be a competitor with the Government telegraph. If the Government shall, at its own cost, construct an electric telegraph over India, it will have as clear a right to prohibit the railway company from employing their line for any purposes but railway purposes, or such as the Government may sanction, as it has to prohibit the conveyance of letters otherwise than by the Government post, provided the public are allowed the full use of the telegraph line.

11. It is not absolutely essential that general lines of telegraph should be under the control and management of the Government; they are not so in England, although the Government, in certain specified emergencies, reserved power to itself to take temporary possession of them; but they are so among the continental powers of Europe; and the Government of India would certainly have a right to reserve such measure of control as it pleased; for it is about to construct a general system of telegraph lines all over India, open to the use of the public, at its own sole cost, and it has a direct interest in, and authority over every proceeding of the railway company; its control, therefore, over any competition by the railway telegraph line is complete.

12. For these several reasons: 1st, because provision for the security of the line is necessary; 2dly, because the public and the railway company could not be properly served by one wire and establishment, and consequently little expense would be saved by the selection of the course of the railway for the direction of the telegraph; 3dly, because communications with the places on and beyond the river by means of the railway telegraph may be made complete; 4thly, because, in that case, distance and cost of the direct line would be considerably reduced, by reason of a branch to Dinapore not being necessary; and, 5thly, because all competition may be excluded, I am of opinion that the electric telegraph from Calcutta to Benares should be carried through the station of Barrackpore, and along the Great Trunk Road to Benares.

13. There is yet an additional reason for selecting this line, which arises out of the immediate necessities of the time. The Government and the public want the telegraph forthwith. Great exertions have been made to expedite its immediate construction, and there is good ground for hope of success; but the line of railway is not yet settled, and certainly will not be constructed for about seven or eight years to come, according to the most sanguine estimate. The line of telegraph, therefore, could not be laid down with any approach to accuracy, or with any assurance that it would not be necessary afterwards to lift it, in order to bring it into due proximity to the railway line.

14. These considerations appear to me to be conclusive in favour of forming the Government line of electric telegraph along the Great Trunk Road to Benares, as being the shortest, cheapest, safest, and most immediately available line that can be found.

15. In so deciding, the Government will, of course, keep in view the construction of an electric telegraph along the line of railway, which shall be employed for the strict purposes of the railway itself, for Government purposes when required, and for such further lines of communication open to the public as the Government may sanction.

16. The reply of the Lieutenant-governor of the North-western Provinces establishes that there also the electric telegraph will best be carried, generally speaking, along the Grand Trunk Road.

Whether it is expedient to carry it across the Ganges at Raghbat, near Benares, and again across the Ganges at Allahabad, with a short branch to Mirzapore, or whether it would not be better to carry it by Mirzapore to Allahabad, and so cross only one great river, is a point of detail which may be settled by Dr. O'Shaughnessy hereafter.

The same remark will apply to the questions raised regarding Agra and Meerut. Those two places must certainly be included in the chain of communication by some means.

17. The table contained in the secretary's note will show how vast a power of communication and command the construction of this line will place in the hands of the Government, enabling it to put in motion from 70,000 to 75,000 troops over 1,500 miles of territory in probably less than an hour's time.

18. The subsidiary question of an electric line in connexion with the Ganges Canal will be attended to when the main line is laid out.

19. There appears to me to exist no room for doubt as to the proper direction of the electric telegraph between Hindostan and Bombay.

20. The Military Board of that Presidency appears to call in question the decision of the Supreme Government, that the Bombay and Calcutta commu-

nication should be effected, not directly, but by means of the main line, which must be carried into Hindostan at any rate. They do so on singular grounds.

They observe: "The extreme rapidity of communication by electric telegraph diminishes, in part, the objections to a circuitous route, but does not altogether remove them. The small additional delay may be of little consequence, but the increased expenditure and risk of interruption attending a lengthened line are more serious considerations."

It is precisely because I would avoid "increased expenditure," and would provide as much public convenience as possible for a given sum, that I think it expedient not to spend money on a separate direct line from Bombay to Calcutta, when use can be made of a line which must be made to Agra at any rate, and which enables Bombay to communicate with equal facility with Upper India and Bengal.

What the "risks of interruption," to which the Military Board alludes, may be, I do not know. I am aware of none upon the line by Agra, which would not exist upon a line direct.

21. All parties, with this exception, at Bombay, are agreed that the electric line should be brought from Bombay to Mhow.

The Government gives very good reasons why it should be carried from Mhow, by Mulligaum and Nassick, to Bombay.

As in the case of the Bengal Presidency, this line of direction seems to me to be the shortest, cheapest, safest, and most immediately available, I would therefore decide upon its adoption.

It does not touch many military stations, but it touches those from which alone effectual aid could be given by Bombay to Hindostan, if railways afforded the means of conveying it; for it communicates with Bombay and with Poona, by way of the Madras line; while Ahmednuggur, the great artillery station, is but 70 miles distant from Poona.

22. All concur in thinking that an electric line should be formed between Madras and Bombay, and all agree that it should be carried by Bangalore and Bellary.

From Bellary the Madras Government would proceed by Hyderabad Sholapore, and Poona; the Bombay Government would carry it by Belgaum, and Kolapoor and Poona.

23. The latter is by far the shorter line (excluding the branch to Hyderabad), and is of greater public importance. I would therefore select it as the main line of electric telegraph between Madras and Bombay.

24. The Madras Government urges the construction of a line of telegraph, for communication with Hyderabad and Nagpore.

I recognise the importance of this in both cases, especially in that of Hyderabad. The troops at both are from the Madras Presidency, and their natural communication would be with Madras. It seems also that the most direct line would be by Hyderabad to Nagpore. The distance from Bellary to Hyderabad is 225 miles; from Hyderabad to Nagpore, 325; in all, 550 miles. The alternative line of communication with Nagpore, by way of Poona and Ahmednuggur, would be about 375 miles; making the communication with the two places about 600 miles.

The direct line by Hyderabad to Nagpore is therefore the shorter. In both cases the line would pass almost entirely through foreign territory.

These considerations induce me to recommend that Hyderabad and Nagpore should not be included in the general scheme at the present moment.

25. That scheme will include nearly 3,500 miles of electric telegraph, and will form a system at once comprehensive and manageable.

26. Next in importance, I should be disposed to reckon a line connecting Calcutta with the Eastern Provinces.

In the first instance, it might be carried from Prome to Sandoway, whence a steamer would bring intelligence to the Presidency from Pegu, of two days' date. Subsequently it might be extended by Arracan and Dacca to Calcutta. This latter general line is probably remote in prospect. A line from Prome to Sandoway might with advantage be commenced at once. The distance is

short; materials, except the wires, are on the spot; and the benefit would be immense.

27. If my honourable colleagues should concur in these views, the secretary should be requested to carry into effect the detailed instructions without delay.

28. I can vouch, by personal inquiry on the spot, that the 50,000 posts of iron-wood indented for by Dr. O'Shaughnessy cannot possibly be obtained, either to the number or at the cost he named, in either of the Provinces of Tenasserim or Arracan.

29. The secretary is requested to submit a note of the points on which orders are required in the several Presidencies, as soon as he shall have despatched them.

(signed) *Dalhousie.*

7 May 1853.

I concur.

9 May 1853.

(signed) *J. Lewis.*

EXTRACT from a Despatch from the Government of India to the Honourable the Court of Directors in the Home Department; dated the 22d July 1853. No. 49.

Introduction of the Electric Telegraph in the North-Western Provinces.

Home Cons.
18 January 1853,
Nos. 31 to 35-

27. THESE papers, which ought to have accompanied our letter, No. 37, dated the 10th ultimo, but which were not forthcoming at the time, will inform your Honourable Court of the views entertained by the Lieutenant-governor of the North-western Provinces, with respect to the introduction of the electric telegraph in those Provinces.

EXTRACT from the Proceedings of the Most Noble the Governor-General of India in Council in the Home Department, under date the 28th January 1853.

No. 54 A, of 1853.—General Department.

No. 31. From *William Muir, Esq.*, Secretary to Government for the North-Western Provinces, to *J. P. Grant, Esq.*, Secretary to Government of India, Home Department.

Sir,

I AM desir'd to acknowledge the receipt of your letter, dated 22d December last, regarding the introduction of the electric telegraph into the North-western Provinces.

2. The Lieutenant-governor learns with great satisfaction that there is good hope of the early commencement of this great undertaking, and hails the prospect of its accomplishment, as forming a new era in the history of the country, and adding a fresh stimulus to the intellectual development of the inhabitants. His most earnest efforts will be always given to facilitate the progress of the work.

3. As justly observed in paras. 10 and 11 of your letter, the Grand Trunk Road at present undoubtedly affords the greatest facilities for conducting the line of electric telegraph through these provinces. It is direct level, well bridged wherever practicable, and above all has maintained upon it a constant and vigilant watch and ward. From it branches may be easily thrown off on either side. From Benares northward to Goruckpoor and Nipal; from Gopeegunge southward to Nagpoor and Hyderabad; from Cawnpore eastward to Lucknow, westward to Calpee and Bundelcund; from Bewar eastward to Furruckabad and Rohilcund; from Allyghur southward to Agra, Indore, and Bombay; from Rhoorjee north-ward

ward to Meerut and Mussoorie; from Delhi southward to Ajmere and Rajpootana.

4. From this enumeration it will be perceived that the line of road does not, in its passage through the British territory, always touch on the places of greatest commercial or political importance. The direct line passes through Benares, Allahabad, Cawnpore, and Delhi, but it leaves on either side Mirzapoor, Agra, Furruckabad, and Meerut. It must remain for the consideration of those who are familiar with the subject, whether it will be better to deviate in certain cases from the direct line so as to embrace some places that would be otherwise omitted. A small divergence from the direct road that unites Benares with Allahabad, would carry the line through Mirzapoor, and no great divergence from the direct road that unites Cawnpore and Delhi would carry it through Agra and Muttra on one side, or through Furruckabad on the other side. Again, the line from Delhi to Kurnaul might pass through Meerut. The expediency of adopting one or other of these alternative routes, will probably depend on the comparative cost of the formation of the line, the maintenance of the stations, and the cost of the necessary watch.

5. It may be of use to state that Lieutenant-colonel Cautley contemplates the necessity of constructing an electric telegraph along the Ganges Canal, at least in the upper part of its course, so as to guard against the possible loss and injury which might result from the accidents to any of the works where the volume of water is the largest. In this case the canal telegraph might be made to communicate with the Grand Trunk telegraph near Allyghur or Rhoorjee, and thus afford the means of communication by Meerut to Hurdweer.

6. It is possible that the future construction of a railroad along the Doab will afford another preferable line, by which the electric telegraph may be led. In this case, however, the cost of transferring the telegraph from one line to another will probably not be great, and it is hoped that a somewhat remote contingency will not be allowed to interfere with or to delay the execution of the project.

7. A copy of the correspondence will be forwarded to Colonel Cautley, in order that he may be apprized of what is in contemplation, and may be prepared to offer his very valuable suggestions on any question which may arise of doubt or of difficulty in the progress of the work.

I have, &c.
(signed) *W. Muir*,
Secretary to Government for the
North-Western Provinces.

Camp, 5 January 1853.

Copy PUBLIC DESPATCH to the Government of India, No. 64.

Para. 1. WITH reference to the proceedings reported in the letters noted in the margin,* we have only to express our entire concurrence in the selection which you have made of the lines for the electric telegraphs.

2. We observe that our Governor-general, in his minute upon the subject, refers to the expediency of connecting Calcutta with the Eastern Provinces by means of the telegraph: "In the first instance," he states, "it might be carried from Prome to Sandoway, whence a steamer would bring intelligence to the Presidency from Pegue of two days' date. Subsequently, it might be extended by Arracan and Dacca to Calcutta. This latter general line is probably remote in prospect. A line from Prome to Sandoway might with advantage be commenced at once."

3. It appears to us very desirable that a ready and speedy communication should be opened between the newly acquired province of Pegue and the seat of

* Letter from, No. 70, dated 29th December 1852, and No. 37, dated 10th June 1853, and para. 27 of letter from, No. 49, 22d July 1853.—Reporting proceedings in determining the direction of the electric telegraph lines throughout India.

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of government. We trust, therefore, that you will adopt measures for carrying out the suggestion of the Governor-general with reference to the connexion of Prome with Sandoway, or any more accessible point, in the course of the ensuing cold season.

4. With respect to the plan for continuing the line to Calcutta, we shall await your report as to the materials required for the purpose.

5. We observe also, in para. 25 of his Lordship's minute, that the scheme already sanctioned is calculated to include a distance of 3,500 miles. You are aware that we have taken measures for the supply of materials for 3,150 miles only. We do not apprehend that this supply will be insufficient for the completion of the first and second stages of the operation, as explained in Dr. O'Shaughnessy's manual, but we shall be glad to receive your views with regard to any further materials you may require, both for the plan already matured and the lines to the Eastern Provinces, in order that we may take the necessary steps for providing them.

London, 12 October 1853.

We are, &c.
(signed) *J. Oliphant,*
&c. &c.

Copy LETTER in the Home Department, No. 20, of 1854.

To the Honourable the Court of Directors of the East India Company.

Honourable Sirs,

It is with the highest satisfaction we have to announce to your Honourable Court the completion of the line of electric telegraph from Calcutta to Agra, and the opening of it on the 24th instant, by a message from the superintendent, Dr. O'Shaughnessy.

2. The event has been recorded in a minute by the Governor-general, and notified in the "Calcutta Gazette."

3. We have sanctioned, as a mark of our approbation of the energy and industry manifested in the accomplishment in so short a time of so great a work, the grant of double pay, for the month of March, to the whole of the establishment employed on the line.

Fort William, 27 March 1854.

We have, &c.
(signed) *Dalhousie.*
J. Dorin.
J. Low.
Fred. J. Halliday.

Copy PUBLIC DESPATCH to the Government of India, No. 41.

Letter from, No. 20, dated 27th March 1854.—Reporting completion of line of electric telegraph from Calcutta to Agra.

Para. 1. We have received, with the same degree of satisfaction that you have communicated the event, the announcement of the opening of the line of electric telegraph from Calcutta to Agra, on the 24th March last, by a message from the superintendent, Dr. O'Shaughnessy, to his Lordship the Governor-general.

2. We entirely concur with you in regarding the event as one of great interest and importance. The speedy execution of this section reflects the highest credit upon all who have been engaged in the undertaking, and we cordially approve of the manner in which you have testified your approbation of the services of the superintendent and those employed under him.

London, 21 June 1854.

We are, &c.
(signed) *J. Oliphant,*
E. Macnaghten,
&c. &c.

EXTRACT LETTER from the Government of India to the Court of Directors (in the Home Department), No. 21, dated 31 March 1854.

Para. 3. ON Dr. O'Shaughnessy's arrival, he was at once gazetted as "Superintendent of Electric Telegraphs in India," and his assistants, Messrs. Shepherd, Branton, and Green, as "Deputy Superintendents of Electric Telegraphs," in Calcutta, Madras, and Bombay, respectively.

4. Dr. O'Shaughnessy's official correspondence with the Government is conducted through the secretary in this department. The superintendent is responsible solely to the Government of India, and takes his orders exclusively from it. He will correspond directly, or through his deputies, with the several local authorities in the execution of the instructions he may receive from this Government, and in reply to communications from them. His deputies will correspond with such officers as the local governments may appoint; in the execution of the details of local business, and will attend with deference to any communications they may receive from the local governments, and comply with them, unless they should be at variance with the instructions of the superintendent, in which case the latter will refer to us for orders.

5. It is indispensably necessary for the effectual working of a general system of telegraphs throughout the country, that there should be uniformity of management and unity of authority; but the superintendent has been informed that it is our special desire that every deference which is consistent with the preservation of such uniformity, should be shown by the officers of the telegraph establishment to the local governments.

6. It has been left to the superintendent to recommend the appointment or removal of his deputies and inspectors,* and to appoint or remove signallers of his own authority. The latter fact will, however, be noticed in his periodical reports. These reports will contain a concise narration of all his proceedings, and will be furnished monthly.

7. The superintendent draws a salary of Rs. 2,000 per mensem, and actual travelling expenses. It was at first intended he should receive travelling allowance at the rate of Rs. 10 for every day that he may be absent on duty from his head-quarters at Calcutta; but this order was afterwards modified, at Dr. O'Shaughnessy's own request.

8. Each of his deputies will receive Rs. 500 a month. It was intended they should draw a travelling allowance of Rs. 5 per diem when actually employed on road duties, but this order has since been modified in favour of the officiating assistant superintendent at Calcutta, as in the case of Dr. O'Shaughnessy.

9. Mr. Browne, who came out in charge of the Warley artificers, has been appointed an inspector of the first class, on a monthly salary of Rs. 250, with travelling allowance of Rs. 3 a day while engaged on road duties.

10. The Warley artificers will each receive Rs. 68. 12. 9. per mensem. The men have been warned that misconduct on their part will be visited by retrenchment of their staff pay (Rs. 20), or by remand to the army.

11. The following scale of establishment has been sanctioned for the telegraph department of the several Presidencies:

For Bengal and the North-Western Provinces.

Two deputy superintendents, at Rs. 500 each a month, and a travelling allowance of Rs. 5 a day.

Four inspectors, 1st class, at Rs. 250 each per mensem, with travelling allowance of Rs. 3 a day.

Twenty

* During the progress of the works, the superintendent has been authorised to appoint inspectors himself, subject to our confirmation, he being of opinion that the arrangements respecting these officers can be best made on the spot in the different localities which he may visit.

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Twenty inspectors, 2d class; salary, Rs. 150 each per mensem, and a palanquin allowance of Rs. 50 each a month.

Twenty inspectors, 3d class; salary, Rs. 100 each per mensem, and a palanquin allowance of Rs. 50 each a month.

For Bombay.

One deputy superintendent, on the same pay and allowances as for Bengal.

One inspector, 1st class, on the same pay and allowances as for Bengal.

Five inspectors, 2d class - - ditto - - - ditto.

Five inspectors, 3d class - - ditto - - - ditto.

For Madras.

One deputy superintendent, on the same pay and allowances as for Bengal.

One inspector, 1st class - - ditto - - - ditto.

Three inspectors, 2d class - - ditto - - - ditto.

Three inspectors, 3d class - - ditto - - - ditto.

12. The superintendent, deputies, and inspectors will be supplied with tents and the necessary establishments from the commissariat department.

13. Dr. O'Shaughnessy has been allowed to entertain an office establishment at a cost of Rs. 133 per mensem. The *bonâ fide* travelling expenses of such portion of this establishment as may accompany him on his tours will be charged in a contingent bill.

14. For the deputy superintendent in Bengal, an office establishment to the extent of Rs. 224 per mensem has been sanctioned.

15. The office establishments for the other deputies have not yet been fixed.

16. These several establishments have been sanctioned, subject to any modification which the course of further experience may suggest.

17. We forward herewith a set of rules for the audit and account of the charges in the telegraph department, which have been laid down in communication with Dr. O'Shaughnessy and the accountant to the Government of Bengal.

18. In his communication of the 21st November last, Dr. O'Shaughnessy proposed to lay down at once a branch line to Simla, but this we did not consider necessary until the line in the plains shall have been completed. The superintendent's attention has been drawn to the necessity for the early completion of this line from Lahore to Peshawur.

19. In the same communication the superintendent alluded to the embarrassment and inconvenience caused in some districts by petty lines of telegraph established by private individuals. The only line of this description of which we were aware was the one at Indore, constructed by Dr. Impey, the Residency surgeon. From its being in the territories of an independent prince, it was not in our power to prohibit the establishment of this line, even if we were disposed to do so. But we had no such desire. England is not included among the countries where all private lines are prohibited; and although British India resembles some of the countries in Europe, in having the telegraph under the control of the Government, it is not advisable, we think, that the example of those countries should be followed, in the exclusion of every other telegraph but their own.

20. As private enterprise has not undertaken this public improvement, and as the outline of a general scheme of communication by electric telegraph has been commenced by the Government at its own sole cost, the Government is fairly entitled to prohibit by legislation, as in the case of the postal system, any private lines which shall compete with the Government lines of telegraph. But we are not disposed to commit the Government to any general prohibition of private lines in all possible circumstances. By extending the Government system over every line where there is any such need of it as is likely to encourage its

its being undertaken by private parties, the risk of competition will be removed, and the uniformity of system, to which the superintendent justly attaches so much value, will be preserved.

21. Dr. O'Shaughnessy left Calcutta in January last. Before doing so, he thus described the objects of his contemplated tour:

1st. To communicate personally with each working party in Bengal, the North-western Provinces, and the Punjab, and to witness their operations for two or three days, explaining to them in person all matters affecting their duties and progress.

2d. To organise at the flying terminus of each station of the works the movable classes of signallers who are to conduct the correspondence when the line is open.

3d. To start additional working parties as fast as the requisite straightening machines are supplied on the road as high as Peshawur.

4th. To visit Bombay and Madras after the above duties are accomplished, unless difficulties should in the meanwhile arise at either of those Presidencies, demanding his immediate and personal attention.

5th. To carry on, at, and from Agra the most important of all his duties, viz. the ascertainment by careful experiments of the distances at which direct stations of correspondence can be maintained during the rainy season, and the trial of all the instruments used in Europe and America.

6th. The arrangement of a "Code for Secret Government Correspondence," on the French system, from materials to be supplied from the several departments of the Government.

22. In the above duties, and in his subsequent visits to Madras and Bombay, the superintendent believes his time will be fully and most advantageously occupied for two years, after which time the head-quarters of the superintendent will be at Calcutta.

EXTRACT PUBLIC DESPATCH from the Court of Directors of the East India Company to the Government of India, No. 11.

1. In your despatch of 27th March, you reported to us the opening of the line of electric telegraph to Agra, and in our reply we expressed our satisfaction at receiving the announcement of that important event. It now only remains for us to signify our entire approbation of the proceedings which led to such a result.

Electric Telegraphs.

Letter from, No. 21, dated 31st March 1854.

Paras. 1 and 2.—Reporting electric telegraph proceedings prior to Dr. O'Shaughnessy's return to India.

2. We approve of the following scale of establishment for the telegraph department in the several Presidencies which you have authorised, viz.

Paras. 3 to 18.—Reporting proceedings connected with the organization of the electric telegraph department.

For Bengal and the North-Western Provinces.

Two deputy superintendents at Rs. 500 each a month, and a travelling allowance of Rs. 5 a day.

Four inspectors, 1st class, Rs. 250 each per mensem, and a travelling allowance of Rs. 3 a day.

Twenty inspectors, 2d class, salary Rs. 150 each per mensem, and a palanquin allowance of Rs. 50 each a month.

Twenty inspectors, 3d class, salary Rs. 100 each per mensem, and a palanquin allowance of Rs. 50 each a month.

For Bombay.

One deputy superintendent, on the same pay and allowances as for Bengal.

One inspector, 1st class, on the same pay and allowances as for Bengal.

Five inspectors, 2d class ditto ditto.

Five inspectors, 3d class ditto ditto.

For Madras.

One deputy superintendent, on the same pay and allowances as for Bengal.
 One inspector, 1st class, on - - - ditto - - - ditto.
 Three inspectors, 2d class, on - - - ditto - - - ditto.
 Three inspectors, 3d class, on - - - ditto - - - ditto.

3. You have determined that the superintendent shall be responsible solely to the Government of India, and that his orders shall be taken exclusively from it, so that "uniformity of management, and unity of authority may be ensured;" at the same time you have required that "every deference which is consistent with the preservation of such uniformity should be shown by the officers of the telegraph establishment to the local governments."

4. These arrangements, as well as the other matters of detail reported in these paragraphs, have our approval.

Paras. 19 and 20.—
 Regarding the construction of petty lines of telegraph, distinct from the general system undertaken by Government.

5. This question appears to have been raised by the construction of a short line of electric telegraph at Indore, which being within the territories of an independent prince, was beyond your power of direct control. With regard to the broad question of permitting lines, independent of those established by Government, to be constructed as used within our own territories, while we concur with you in opinion that no general prohibition of private lines under all possible circumstances should at once be laid down, we are disposed to think that it would be more advantageous to a country like India, where, you justly observe, uniformity of management is of great importance, and where the circulation of false or inaccurate information, either from design or accident, should be specially guarded against, that the telegraph operations should be conducted exclusively under the control of Government, and that whatever means are employed in constructing lines, they should all be included in the system under the management of the superintendent, who is responsible to you for the proper and efficient working of the department.

6. We do not here refer to the railway lines of telegraph, which will be considered separately.

7. We shall be glad to see the electric telegraph made available to the community at large, by the imposition of as low a rate of charge as possible for the transmission of messages; but while every encouragement is given to its general use, as well as to its extension into districts where it may be wanted, we think that precautions should be taken to prevent this important instrument of communication from being abused.

Paras. 21 and 22.—
 Stating the object of Dr. O'Shaughnessy's tour of inspection.

8. The objects of Dr. O'Shaughnessy's tour were very important. The success and efficient working of an undertaking of this nature, in a great measure depends upon a judicious commencement, and we have every reason to expect that Dr. O'Shaughnessy will, through his talent and energy, overcome all the difficulties which attend the establishment and organisation of a novel undertaking of such magnitude.

9. We observe from para. 22, that you have fixed upon Calcutta as the headquarters of the superintendent, when the lines are completed and in full work. The experience that you will gain in the meanwhile will enable you better to judge whether this arrangement will be the most desirable. It only occurs to us that a place in a more central situation as respects the system of telegraphs, might afford a better means of control to the superintendent, in case of instances occurring when his presence at certain parts of the line might be necessary.

We are, &c.

(signed) J. Oliphant,
 E. Macnaghten,
 &c. &c.

London, 17 January 1854.

EXTRACT PUBLIC DESPATCH from the Court of Directors of the East India Company to the Government of India, No. 48, dated 2 May 1855.

1. THE satisfactory reports on the progress of the electric telegraph works between Calcutta and the North-west Provinces, submitted with your letter No. 55 of 1854, display the effects of the energetic management of the superintendent.

2. We entirely approve of your proceedings, and concur with you in regarding the rapid prosecution of the works as highly creditable to Dr. O'Shaughnessy, and to those who by their zeal and activity have aided him in their execution.

3. The proceedings in the Bombay Presidency, though not marked by the same rapid progress, show an anxious desire on the part of the deputy superintendent and his assistants, to proceed with vigour in the execution of their duty, and the result is satisfactory.

4. We regret to find that the same gratifying reports have not been received from Madras, but we trust that the measures which you adopted have ensured an active prosecution of the works in that Presidency.

With respect to the charges for messages, you have sanctioned the rate of one rupee per 16 words for distances at and under 400 miles, and no message is to count as less than one rate.

Experience in the working and use of the line will enable you to judge of the expediency of this scale of charge. It would appear to us that the establishment of lower rates, for well-chosen stations at shorter distances, might afford additional convenience to the public, and might be advantageous to the interests of the undertaking. Under the rules in question, the charge for a message of 16 words from Calcutta to Barrackpore, a distance of 16 miles, would be as much as the same message to Benares, 400 miles distant. But we see no reason why it should not answer to have smaller charges for shorter distances. At the same time every station should be self-supporting, and not established without reasonable expectations of its being so.

Public Department, 27 November (No. 142) 1854.

To the Honourable the Court of Directors for the Affairs of the Honourable East India Company, London.

Honourable Sirs,

WE have the honour to report our proceedings in connexion with the introduction of the electric telegraph into this country.

2. In December 1852, the Government of India transmitted us a copy of your Honourable Court's despatch to their address, No. 38 of 1852, with its accompanying letter from Dr. O'Shaughnessy, and requested our opinion as to the direction which the proposed lines of telegraph between Bombay and Calcutta, and Bombay and Madras should take.

3. Our views on this subject were communicated to the Supreme Government in March 1853, and it was decided by that authority that the line from Agra should run along the high road through Gwalior to Mhow, and thence, *vid* Doolia, Malligaum, Nassick, and Tanna, to Bombay; and that the line between Bombay and Madras should be carried through Poona, Sattara, Kolapoor, Belgaum, Dharwar, Bellary, Bangalore, Vellore, and Arcot.

4. On receipt of your Honourable Court's despatch, No. 14 of 1853, intimating the appointment of Dr. Green as assistant-superintendent of the electric telegraph, we directed the Military Board, the engineer officers under their control, and the magistrates along the proposed lines of telegraph, to render that officer and the parties employed under him all the assistance they might require in carrying out the work.

5. Dr. Green arrived here on the 1st of August 1853. He was authorised to rent an office in the fort, and to appoint any persons whom he might select for his

his establishment, on such salaries as he might consider their services to merit, pending instructions from the Supreme Government in regard to the scale of allowances for the various grades in the electric telegraph department, a sum of Rs. 1,000 was placed at Dr. Green's disposal, to enable him to construct instruments for giving instruction to his assistants and signallers.

6. Several consignments of stores for the electric telegraph, despatched by your Honourable Court, were received during last year. These were stowed in godowns, hired for the purpose, and placed in charge of the assistant superintendent.

7. Dr. Green reported to us his intention to commence, on the 1st October 1853, the construction of a flying or temporary line of telegraph, consisting of a single wire, suspended on bamboos. This experimental line, it was intimated, was not intended to last for more than a year or two, during which all the points necessary for the establishment of a double and permanent line would be carefully studied and determined.

8. Dr. Green was permitted to organise six working camps previous to commencing field operations, and he was allowed credit to such extent as he required on our treasuries along the two lines, to enable him to meet the expenses which he might incur *bona fide* on account of the electric telegraph.

9. The duty of collecting, depositing, and erecting posts for the electric telegraph was entrusted to the local engineer officers of the Public Work Department, with authority to make such additions to their establishments as might be necessary for this purpose.

10. The 12 artificers referred to in the letter of the deputy-secretary at the East India House, of the 3d August 1853, arrived here in December last, and their services were placed at the disposal of Dr. Green.

11. Field operations for the construction of the electric telegraph were not commenced at the time fixed upon. The chief causes of delay were stated to be the non-arrival of the artificers and some of the materials from England. We beg to refer your Honourable Court to the letter addressed by Dr. Green to the Superintendent of the Electric Telegraph on this subject, under date the 1st December last, a copy of which will be found among the proceedings accompanying this despatch.

12. The timber-producing jungles of this Presidency being in some cases inaccessible until January, short delays occurred in some districts in the supply of posts for the electric telegraph.

13. Under instructions from the Superintendent of the Electric Telegraph, Dr. Green left Bombay on the 23d December last, to proceed along the Agra line to Indore. Before his departure he had succeeded in laying down wire underground from his office opposite the Secretariat to the Esplanade. This work was described by him as "a delicate operation, which has succeeded perfectly, although we had no instruments of any kind to test our work as we went along, neither could we obtain any plans or sections of the numerous drains we had to cut through."

14. Dr. Green having suggested the adoption of measures by which his department might be enabled to carry the telegraph works through private lands, &c., the requisite provision was made in a draft Act empowering Government to take land in the Mofussil for public purposes, which has been submitted to the Government of India from the Financial Department.

15. In the meantime, the European and native officers in the districts were instructed to enter into arrangements with the landholders, and compensate them for any loss they might unavoidably sustain. The collector of Bombay was at the same time directed to arrange with the landholders at the Presidency to remove, when necessary, any branches of trees, or similar obstructions.

16. Instructions were also issued to the local authorities to adopt measures for the protection of the telegraph lines from injury.

17. We have much pleasure in reporting that the line of telegraph between Bombay and Calcutta has been completed. The line to Madras has been finished

finished as far as Sattara. It is in progress beyond that point, and will, it is hoped, be complete to Madras in a month's time.

18. The completed lines have not, as yet, been officially reported fit for service, though they are frequently used for the transmission of messages. Dr. Green has intimated that "numerous experiments must be made, and various errors must be corrected, before he can venture on an official declaration that the line is open."

19. Temporary offices have been opened at Callian, Nassick, Malligaum, and Seerpoor for the purpose of testing the line. The points for permanent offices have not as yet been determined.

20. Dr. Green has been instructed to make an arrangement, whereby particular Government despatches may pass from the telegraph office to the Secretariate, without being known to the signallers or other persons in the former office.

21. We have authorized the erection of a building in the Secretariate compound at a cost of Rs. 7,421 as a residence for the clerk in charge of the separate department, who has been entrusted with the duty of making telegraphic communication between the Secretariate and Parell.

22. In December last we received intimation from the Government of India of the appointment of Dr. Green as deputy superintendent of the electric telegraph, on a salary of Rs. 500 per mensem, with travelling allowance at the rate of Rs. 5 per diem.

23. The following establishment of inspectors was at the same time sanctioned by the Supreme Government for this Presidency.

One inspector, 1st class, salary Rs. 250 per mensem, and travelling allowance at Rs. 3 a day.

Five inspectors, 2d class, salary Rs. 150 each, and a palanquin allowance of Rs. 50 each per mensem.

Five inspectors, 3d class, salary Rs. 100 each, and a palanquin allowance of Rs. 50 each per mensem.

24. The sums below specified have been separately sanctioned by us on account of the electric telegraph works :

	Rs.	a.	p.
For the purchase of zinc	1,317	6	11
For erecting standards in the vicinity of certain rivers in the Nassick sub-collectorate	220	-	-
For constructing masonry basements, and erecting teak posts, at certain unbridged nullahs between Dharwar and the Tungbudra River	1,951	-	-
For erecting masonry standards in the vicinity of certain rivers in the Dharwar districts	1,000	-	-

25. We have directed that the expenses incurred on account of the electric telegraph should be brought forward under the head of "Charges on account of electric telegraph," and audited according to rules which have been laid down by the Government of India.

Bombay Castle,
27 November 1854.

We have, &c.
(signed) *Elphinstone.*
J. G. Lumsden.

Copy PUBLIC DESPATCH from the Court of Directors of the East India Company to the Government of Bombay, No. 27.

1. THIS report embraces an account of the proceedings at your Presidency, relating to electric telegraphs, since, towards the close of the year 1853, it was determined to establish a system of telegraphic communication for the whole of India, up to the completion of the line between Bombay and Calcutta, *via* Malligaum, Mhow, Gwalior, and Agra.

Electric Telegraph.
Letter from, No. 142, dated 27th Nov. 1854.

Reporting proceedings in connexion with the introduction of the electric telegraph into the western part of India.

2. The

2. The commencement of field operations at your Presidency did not take place till December 1853, since which period the works have been prosecuted with vigour, and were brought to a successful issue within 12 months.

3. Dr. Green, the deputy superintendent of electric telegraphs at your Presidency, is entitled to much credit for the zeal and energy displayed by him in producing, with the aid of your Government, this satisfactory result.

4. We have, in a despatch to the Government of India, expressed our concurrence in the selection which has been made of the direction of the lines.

5. We hope soon to learn that a telegraphic communication has been effected between Bombay and Madras.

6. We have only to add the expression of our approval of the proceedings of your Government.

We are, &c.
(signed) *E. Macnaghten,*
W. H. Sykes,
&c. &c.

London, 2 May 1855.

ACT No. XXXIV. of 1854.

Passed by the Legislative Council of India.

(Received the Assent of the Governor-General on the 23d of December 1854.)

AN ACT for regulating the Establishment and Management of Electric Telegraphs in India.

Preamble.

WHEREAS it is expedient that provision should be made for regulating the establishment and management of lines of electric telegraph in India, it is enacted as follows:—

The East India Company to have the exclusive privilege of establishing electric telegraphs.

Proviso.

I. Within the territories in the possession and under the Government of the East India Company, the said East India Company shall have the exclusive privilege of establishing lines of electric telegraph; provided that the Governor-general of India in Council may grant a license to any person or company to establish a line of electric telegraph within any part of such territories, which license shall be revocable on the breach of any of the conditions therein contained.

Penalties for establishing or maintaining unauthorised electric telegraphs.

II. Whoever shall, otherwise than under a license duly granted as aforesaid, establish, or, after revocation of such license, maintain a line of electric telegraph within the said territories, shall be liable to a fine not exceeding Rs. 1,000; and for every week during which such line shall be maintained shall be liable to a further fine not exceeding Rs. 500.

Penalty for using or working such telegraphs.

III. Whoever shall use a line of electric telegraph, knowing or having reason to believe that it is an unlicensed line, for the purpose of sending or receiving messages, or shall perform any service incidental thereto, shall, for every such offence, be liable to a fine not exceeding Rs. 50.

Government may take possession of telegraphs established by license.

IV. The Governor-general of India in Council may, on the occurrence of any public emergency, take temporary possession of any line of electric telegraph established under license within the said territories.

Government may establish telegraph on land of railway company.

V. Any railway company, on being required so to do by the Governor-general of India in Council, shall permit the Government to establish upon the land of such company adjoining the line of railway a line of electric telegraph, and shall give every reasonable facility for establishing and using the same.

Governor-General in Council to frame rules for the conduct of Government telegraphs.

VI. The Governor-general of India in Council may from time to time frame rules for the conduct of electric telegraphs established by Government not inconsistent with this Act, and therein prescribe the regulations, conditions, and restrictions according to which all messages and signals shall be transmitted.

VII. The

VII. The Government shall not be responsible for any loss or damage which may occur in consequence of any person employed by the Government in the electric telegraph department failing to transmit with accuracy any message entrusted to him for transmission, and no such person shall be responsible for any such loss or damage, unless he shall cause the same negligently, maliciously, or fraudulently.

Government not responsible for loss or damage.

VIII. Whoever shall, without permission, enter into a Government telegraph office, or shall refuse to quit the same on being requested to do so by any officer or servant employed therein, or shall wilfully obstruct or impede any such officer or servant in the performance of his duty, shall be liable to a fine not exceeding Rs. 100.

No person to intrude into a telegraph office.

IX. Whoever shall wilfully cause, or attempt to cause, any interruption to the transmission of signals along a line of electric telegraph established by the Government, by cutting or injuring the wire, or by injuring any portion of the line, or any instrument or apparatus, or by any other means, shall be liable to be imprisoned, with or without hard labour, for a term not exceeding two years, or to fine, or to both.

Penalties for cutting the line.

X. Whoever shall wilfully or negligently damage or injure any post or any portion of the line of such electric telegraph, shall be liable to a fine not exceeding Rs. 50.

Injuring posts, &c.

XI. Whoever, being in the employ of the Government in the electric telegraph department, shall fraudulently or maliciously secrete, make away with, alter, or omit to transmit any message which he may have received for transmission, or shall fraudulently or maliciously disclose any message so received by him and directed to be kept secret, shall be liable to be imprisoned, with or without hard labour, for a term not exceeding two years, or to fine, or to both.

Penalties for fraudulently omitting to transmit messages, or for disclosing secret messages.

XII. Whoever being in such employ shall be guilty of any act of drunkenness, carelessness, or other misconduct, whereby the transmission or delivery of any message shall be endangered, or who shall loiter or make delay in the transmission or delivery of any message, shall be liable to a fine not exceeding Rs. 100.

Penalty for misconduct.

XIII. Whoever being in such employ shall transmit by the electric telegraph any message upon which the prescribed charge has not been paid, intending thereby to defraud the Government, shall be liable to be imprisoned, with or without hard labour, for a term not exceeding two years, or to fine, or to both.

Penalties for sending messages without payment to Government.

XIV. Whoever shall fraudulently or maliciously transmit or cause to be transmitted by an electric telegraph established by Government a message which he knows to be false or fabricated, shall be liable to be imprisoned, with or without hard labour, for a term not exceeding two years, or to fine, or both.

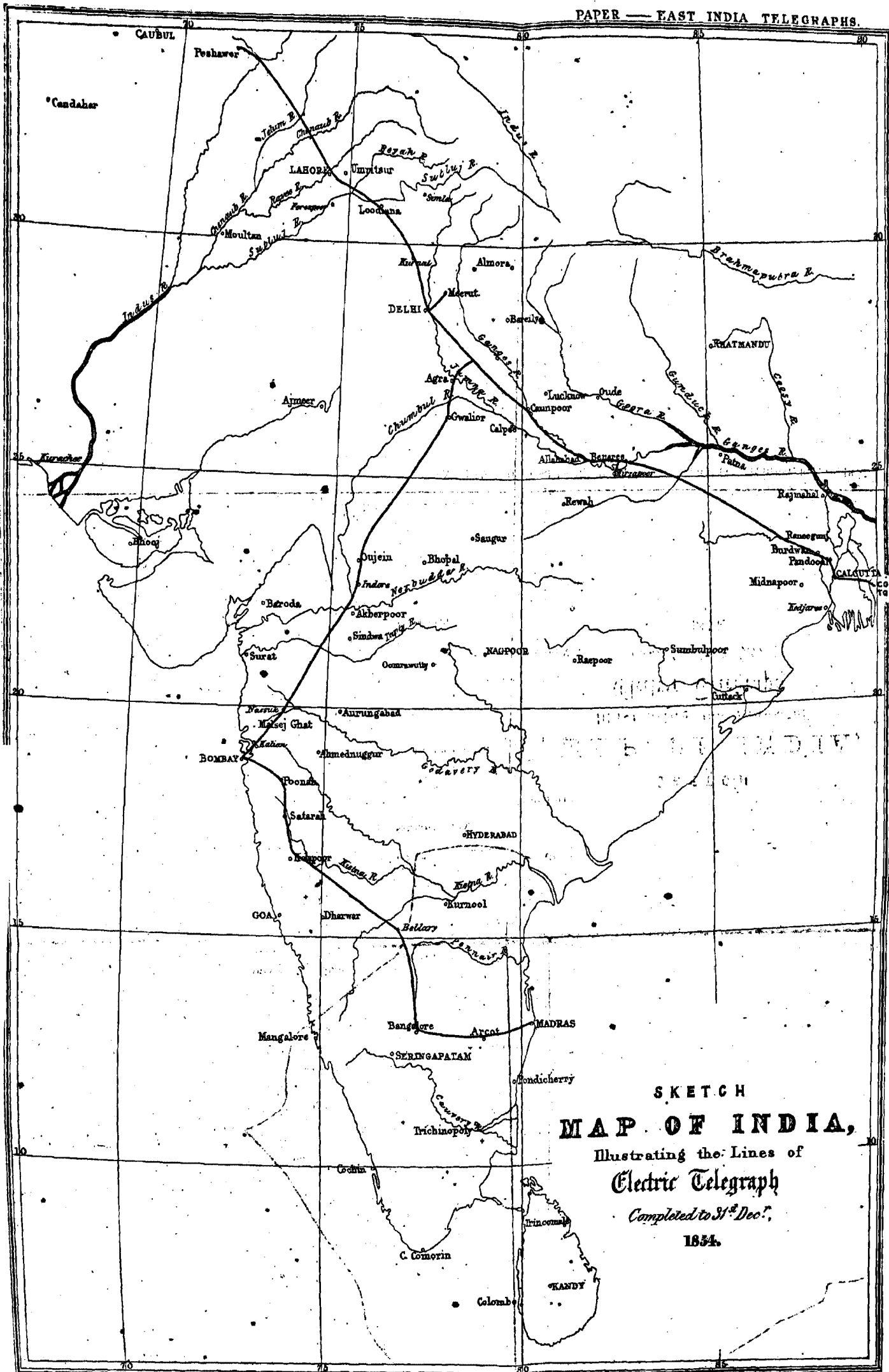
Penalties for transmission of fabricated messages.

XV. Any person not being a European British subject, who shall, beyond the local limits of the jurisdiction of Her Majesty's Supreme Court of Judicature, commit any of the offences mentioned in Sections IX. XI. XIII. and XIV. of this Act, shall be punishable upon conviction by any magistrate within whose jurisdiction the offence shall be committed.

Persons other than European British subjects liable to be punished.

XVI. Any person, whether a European British subject or not, who shall be guilty of any offence, for which, according to the provisions of this Act, he shall be liable to a fine only, shall be punishable for such offence by any justice of the peace for any of the Presidency towns of Calcutta, Madras, and Bombay, or for any of the Settlements of Prince of Wales' Island, Singapore, and Malacca, magistrate, joint magistrate, or person lawfully exercising the powers of magistrate, within whose jurisdiction the offence shall be committed; and any person hereby made punishable by a justice of the peace shall be punishable upon summary conviction,

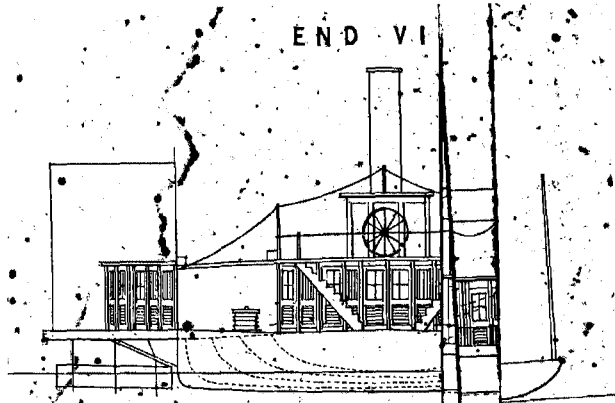
Fines, how to be recovered.



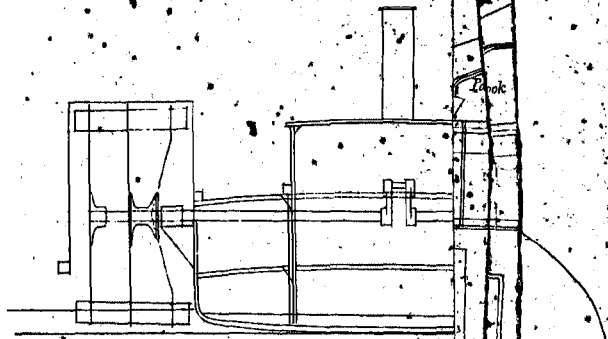
SKETCH
MAP OF INDIA,
 Illustrating the Lines of
Electric Telegraph
Completed to 31st Decr.,
1854.

Printed by G. S. & Co. for the Queen.

END VI



SECTION AT EN C



PASSENGER BOAT FOR T

DIMENSION

Length on 2 nd Water Line	
Bearn	
Depth	
Do. to top of Fore and Aft Girders	
Draught Loaded	
Displacement per inch beyond 2'	
Engines	Effective
Do	Nominal

Scale 1/8" = 1'

