8 The British Indian telegraph network

8.1 1857 and the telegraph

On 29 September 1897, the *Daily News* printed a short piece on the Indian Uprising, which forty years earlier had been in full swing. Under the heading 'How the Electric Telegraph Saved India', the article commemorated the contribution of the novel technology – and in particular that of a teenage telegraph signaller at Delhi – to putting down the 'mutiny'.

> There is a third claimant [to the title Saviour of India – after Viceroy Lord Lawrence and John Nicholson], Mr. William Brendish, the signaller boy at the Delhi telegraph office in 1857, who on the 11th May (a day after the outbreak at Meerut) sent the messages partly founded on bazaar 'gup,' which gave the Punjab men, and the Commander-in-Chief at Simla, the first vague news of the mutiny and its murderous work. The electric telegraph, said Montgomery – one of that great school – has saved India. Said Sir Herbert Edwardes, 'that message,' sent by 'that little boy,' was, 'I do not hesitate to say, the means of the salvation of the Punjab.' It enabled Montgomery, and the commanding officer at Lahore to disarm the native troops before the news of the revolt reached the barracks; and to flash their warning over the lines to Peshawar. According to one version of the story, the telegraph boy had just finished the last click of his message when the Sepoys burst into the office and killed him. But young William Brendish not only escaped in good time, but is still living, having retired from the Indian Service with a special pension, and a flattering acknowledgement of his services from the Governor-General.[1]

Of course, what Robert Montgomery, the judicial commissioner of the Punjab,[2] meant when he said that the telegraph 'has saved India' (and what the *Daily News* meant when quoting him) was that it had saved India for rather than from the British.[3] A similar attitude towards the potential uses of the telegraph in India also transpires from a statement by

[1] 'How the Electric Telegraph Saved India', *Daily News*, 29 September 1897, 6.
[2] Deep Kanta Lahiri Choudhury, '"1857" and the Communication Crisis', in *Rethinking 1857*, ed. Sabyasachi Bhattacharya (Delhi: Orient Longman, 2007), 262.
[3] Headrick, 'A Double-Edged Sword', 53; Headrick, *The Invisible Weapon*, 52.

Lord Dalhousie made five years before the uprising and quoted in Deep Kanta Lahiri Choudhury's article on the communication crisis of the year 1857. In 1852, Dalhousie had called the project of creating a telegraph system in India a 'national experiment'. As Choudhury argues, Dalhousie 'was not referring to India as a nation. He meant that it was a national investment for Britain and an experiment in empire. India was to be the empty space for the enactment of the telegraph experiment'.[4] From these quotes it becomes apparent that the introduction of telegraphy to India needs to be seen in a larger imperial context. Questions of administration, security and control were far more important than they ever were regarding the British inland telegraph system. In the latter case, not only had the Admiralty held on to their semaphores for quite some time and shown little interest in the new technology, it had also needed private railway companies, betting men and, of course, the trading community to create a demand for telegraphic communication in the first place. While, in the course of time, the Admiralty and other government departments developed an interest in telegraphy and acquired a number of lines for their exclusive use, the aspect of administration and control was never very prominent in the British inland system, which was mainly geared to serving a business clientele (or the railways for their own purposes). This was different in India, where the sheer geographic size of the colony posed a significant challenge to the British administrators. Here, aspects of efficient administration and imperial control clearly informed Dalhousie's and the East India Company Court of Directors' decision to invest in an Indian telegraph system.[5] The route of the first Indian telegraph line, finished in 1855, from Saugor Island via Diamond Harbour to Calcutta and on via 'the key military cantonments in upper and central India until Peshawar',[6] and the fact that 'Dalhousie even had a line built to the hill station of Ootacamund, where he spent the hot season of 1855',[7] illustrate clearly how important strategic and administrative considerations were in the design of the system. Less well known, however, is the fact that the needs of the business community (and the potential profit to be made from this) had, of course, never been completely absent in the deliberations of the men behind the network.

[4] Choudhury, '"1857" and the Communication Crisis', 263.
[5] Headrick, 'A Double-Edged Sword', 52–3; Headrick, *The Invisible Weapon*, 52–3.
[6] Deep Kanta Lahiri Choudhury, '"Beyond the Reach of Monkeys and Men"? O'Shaughnessy and the Telegraph in India circa 1836–56', *Indian Economic and Social History Review* 37, no 3 (2000), 348.
[7] Headrick, *The Invisible Weapon*, 52.

William O'Shaughnessy[8] – an army surgeon with a long-standing interest in telegraphy and eventually the first Superintendent of Electric Telegraphs in India – had proposed to build the very first stretch of the first line from Calcutta to Chinsurah as he was convinced that

> [a] very large return would, in the opinion of the mercantile gentlemen consulted, be made from Mizrapore and mercantile and banking establishments of Muttra, and the Marwaree shroffs. The newspapers of Upper India would also contribute . . . I would consider it highly probable that these items with the amount above specified (Rs. 8 for 480 words for Calcutta and Bombay) would pay a large sum beyond the yearly expenditure and leave the telegraph eighteen hours available in the day for the use of the government without charge.[9]

O'Shaughnessy's words aptly sum up Dalhousie's and the East India Company's view on the purpose of telegraphy in India: of course, fostering commerce in the colony and generating revenue with the help of the telegraph would not hurt and must surely be included in one's considerations, but most importantly the new means of communication must be at the immediate disposal of the government whenever need arises. Contrary to O'Shaughnessy's plans, John Bethune, a member of the Governor-General's Council, put forward that before being extended to Agra, a line to Chinsurah would not attract much commercial traffic. As an alternative first step, Bethune suggested to telegraphically connect Diamond Harbour with Calcutta in order to provide the Calcutta merchants with swift shipping information. This plan was eventually followed and the stretch from Calcutta to the coast where the Hooghly meets the Bay of Bengal became the first non-experimental telegraph line in India.[10] This choice and the deliberations of both O'Shaughnessy and Bethune clearly illustrate that economic considerations were, of course, not absent in designing and building the Indian telegraph system. Its principal purpose nevertheless rested in enhancing the administration of and ultimately control over the subcontinent. In view of the sheer size of the territory and the large distances that needed to be covered, telegraphic communication promised even higher gains in administrative efficiency than it did in smaller entities. Contrary to what had happened, for instance, in the United Kingdom or the United States, the telegraph was introduced in

[8] For more information on O'Shaughnessy, see Choudhury, 'Beyond the Reach of Monkeys and Men?'; Saroj Ghose, 'William O'Shaughnessy: An Innovator and Entrepreneur', *Indian Journal of History of Science* 29, no 1 (1994); Gorman, 'Sir William O'Shaughnessy, Lord Dalhousie, and the Establishment of the Telegraph System in India'.

[9] Home Department, Public Proceedings, 4 April 1850, No 48, Report 1, quoted in Choudhury, 'Beyond the Reach of Monkeys and Men?', 348–9.

[10] Ibid., 349.

British India practically on government initiative and, at least initially, as a government monopoly. While its economic potential was not unimportant, the origins of the Indian telegraph system therefore need to be interpreted within a larger imperial context in which questions of administration, strategy and control set the general tone. In this context, it is all the more surprising that the system realized during the mid-1850s could not rightly be called a network. Governmental attention rested on the main line between Calcutta and Peshawar (following the general course of the Grand Trunk Road) and on a second route from Madras to Bombay connecting with the first line at Agra.[11] Additional loop lines and cross-connections had long been suggested by experts but had not been realized when crisis struck in 1857. There were only singular connections without backup options. 'The lack of a link between Calcutta and Madras and the absence of circuits or duplicate lines made the system inherently vulnerable.'[12]

The story of the telegraph in the Indian Uprising, therefore, has two rather different sides. On the one hand, there is the imperial narrative popularized in the accounts of British colonial officials and spread by English-language newspapers in both the United Kingdom and the colonies. This is the tale of how the telegraph 'has saved India'. As the *Daily News* article at the opening of this chapter shows, this version of the story emphasized the role of the initial telegram that alerted the British and enabled them to prepare themselves for the outbreak of hostilities. On the other hand, however, most of the important nodes in the rudimentary Indian telegraph network were easily put out of operation during the uprising and the system proved to be vulnerable to the point of uselessness.[13] Accordingly, when the rebellion was eventually put down, the British had learned a double lesson as regards telegraphy in India. First, of course, the technology had proved its potential and it could, indeed, be very useful in times of crisis. Second, however, in order to guarantee such usefulness throughout a crisis, the network had to be improved, extended and cross-linked. As a consequence, as Choudhury points out, after 1857 'the principle of alternate and duplicate lines was adopted in every case, in India, as well as internationally'.[14]

[11] Saroj Ghose, 'Commercial Needs and Military Necessities: The Telegraph in India', in *Technology and the Raj: Western Technology and Technical Transfers to India 1700–1947*, ed. Roy MacLeod and Deepak Kumar (New Delhi, Thousand Oaks and London: Sage Publications, 1995), 157.
[12] Choudhury, '"1857" and the Communication Crisis', 267.
[13] Ghose, 'Commercial Needs and Military Necessities', 166–8; Choudhury, '"1857" and the Communication Crisis', 267.
[14] Choudhury, '"1857" and the Communication Crisis', 267.

The experiences of 1857–8, therefore, gave a great boost to telegraphic development within India and led to the extension of the network in terms of both the length of lines and the number of stations.[15] This will be discussed in more detail in the following section. Such an extension and improvement of the service seems to have been overdue not only regarding security issues but also from a public perspective. On 7 October 1858, *The Times* published a substantial article by its special correspondent in India, William Howard Russell. The piece carried the title 'The English Raj in India' and had been finished at Simla on 17 August 1858, only about two months after the last substantial part of the uprising had been put down at Gwalior. Russell – who had been in Lucknow during the siege and would later publish his Indian diaries[16] – first discussed the old and new attitudes of British administrators towards 'disinherited or ousted rajahs' before he paid very detailed attention to the current state of the Indian telegraph system. About halfway through his article, Russell changed the topic in a rather abrupt manner:

To return to our own affairs, ere I close this letter, the Indian electric telegraph system is in a most imperfect and unsatisfactory state. For the purposes of Government and for the transmission of depatches [*sic*] it is, perhaps, adequate enough, and its utility during the recent campaigns was beyond all price or praise, but even for those purposes it sometimes failed. Posts hastily erected fell or were blown down, and interruptions occurred, which were, however, rapidly remedied by the activity of the European officers of the department. Admitting its uses as a Government machine, it must, however, be fairly stated that as far as the public are concerned the electric telegraph in India is conducted with such utter indifference to good faith that it is practically a swindle, and nothing else or less. They take your money, receive your message, and there is an end of the transaction. The Indian papers teem with groans on this score, but their indulgence in scurrilous personality and their habit of universal aggression and attack have, with some most able

[15] And they also provided additional motivation for the laying of submarine cables as a message transmitted via the short-lived 1858 transatlantic cable successfully cancelled the transhipment of Canadian troops to India when the uprising had already been brought under control. This emphasized the geostrategic potential of submarine telegraphy and gave an additional boost to initiatives in this field (see Chapter 2). Odlyzko, 'History of Communications and Its Implications for the Internet', 38; Headrick, *The Invisible Weapon*, 18; Scholl, 'The Global Communication Industry', 200.

[16] William Howard Russell, *My Diary in India, in the Year 1858–9. Vol. 1* (London: Routledge, Warne and Routledge, 1860); Russell, *My Diary in India, in the Year 1858–9. Vol. 2* (London: Routledge, Warne and Routledge, 1860). Russell was interested in and very well acquainted with telegraphy. As a war correspondent in the Crimean he had reported from the scene by means of telegrams. In 1865, Russell was commissioned to write a book about the laying of the Atlantic telegraph cable. He was onboard the *Great Eastern* during the telegraph expedition in order to get a first-hand impression. The resulting book was richly illustrated by Robert Dudley. William Howard Russell, *The Atlantic Telegraph* (London: Day & Son Limited, 1866).

and honourable exceptions, utterly destroyed the influence of their representations with the Government and the public, if it ever existed.[17]

A little further on Russell then referred to his own experiences with the Indian telegraph system and gave the following case:

> About a month ago I sent a message from Umballah to Calcutta. As I received no reply I wrote to the gentleman respecting its subject matter, and he, in his answer a fortnight after, said, – 'I have received no telegraph message from you. It is, no doubt, on the road, and will turn up some time or other.' Another message to Calcutta I have traced from Umballah to Delhi, beyond which there is no sign of its existence, and the gentleman who honours the country by accepting his salary for the charge of that station has not deigned to reply to an inquiry which I sent him weeks ago as to the fate of a telegram destined for a much longer career.[18]

In the remainder of the report, Russell then moved on to discuss the Indian postal service as an alternative to sending telegrams but pointed out that the post was also not free of deficiencies. He closed the section on the telegraph and postal system in India by saying that every week 'some 20 or 30 complaints appear in the various Indian papers respecting delay in the post and in the telegraph'.[19]

While the size and capacity of the Indian telegraph network started to grow substantially in 1858, Russell's report confirms that for the general public the system worked only imperfectly and was anything but reliable. Therefore it seems that the local commercial classes, for instance, could not use and benefit from the network to the same extent as their European counterparts. This was not for lack of interest, though, as the case of a 'telegraph fraud' occurring in India illustrates. Quoting from the *Bombay Gazette* of 27 February 1861, *Lloyd's Weekly Newspaper* on 31 March 1861 reported on 'The Telegraph Frauds in India', where a few 'speculators in opium have caused messages to be most grossly falsified whilst passing through the wires between Galle and Bombay'. Apparently, two telegraph signallers, George Pecktall and William Allen, who had both been dismissed from service in the Indian telegraph office, had been approached by shady speculators and hired to find a way to interfere with the telegraph system. Pecktall and Allen obliged, somehow managed to obtain a battery and signalling apparatus, 'and proceeded to a spot in the immediate vicinity of the village Beebee chawaddee, about four or five miles off at the foot of the Katruj Ghaut, over which the telegraph wire from Sattar passes'. There, they cut the telegraph wire and inserted their own apparatus into the circuit, which enabled them to intercept messages and forward them in falsified form. The messages concerned dealt with

[17] 'The English Raj in India', *The Times*, 7 October 1858, 9. [18] Ibid., 9. [19] Ibid., 9.

opium prices and 'enormous sums of money were alleged to be made by the parties in the secret'.[20] Despite the fact that the telegraph line had been temporarily disrupted and that suspiciously high profits were made, the fraud was only discovered when full information on opium prices reached Bombay by steamer from Galle.[21]

This episode illustrates how inexperienced in telegraphic matters the Indian mercantile community still was in the early 1860s. But it also draws attention to the general deficits of the telegraph system itself. First, the fact that the fraud remained undetected until the arrival of the steamer testifies to the prevailing lack of alternative routes and cross-links in the Indian telegraph system via which confirmation or rejection of the forged telegrams could have been obtained. Second, the distances covered by the lines were so great that the network was practically unmanageable. Years after the experiences of the Indian Uprising, it was still easy to interfere with the wires without being detected. Third, a notorious shortness of competent and sufficiently trained signallers and clerks further enhanced the unmanageability of the system and made the hiring of unqualified or otherwise unreliable staff a not uncommon feature. This was such a pronounced problem that even the director general of telegraphs in India, Daniel George Robinson, did not fail to notice it in his administration report for the 1862–3 year (which was compiled only in 1866). Here, Robinson commented on the many new provisions in 'the code, which is to define the duties, salaries, responsibilities, and rights of the different officers of the department', and went on to say that these

> changes, all tending to make the officers and signallers of the department feel they are sure of considerate and liberal treatment, have already done an immensity of good. The scarcity of signallers that a year since bid fair to stop work altogether, no longer exists. Many of those officers who had left are anxious to rejoin the department.[22]

Of course, Robinson's report drew attention to the improvement of the situation, but in doing so also made clear how problematic the matter had been around 1860 and 1861.

[20] 'The Telegraph Frauds in India', *Lloyd's Weekly Newspaper*, 31 March 1861, 2.

[21] In the 'Abstracts from the Annual Reports of the Superintendents of Circles for the Year 1862–63', reference was made to the case. 'On the 24th of January 1863, George Pectall [*sic*] . . . incautiously made some admission as to the party who bribed William Allen and himself to cut the wire in February 1861. With the assistance of the Police, it was ascertained that one Nim Chund Melap Chund, a Marwarree Merchant, was the instigator, and he was convicted in the High Court and sentenced on the 6th April to two years' imprisonment with hard labour.' British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1862–63', 1863.

[22] Ibid., 4.

In addition to the changes in the code for signallers and officers, the department also improved their policy towards complaints. Robinson was, again, slightly overoptimistic when he stated that

> it is gratifying to learn [from the officer in charge of the check and complaint office] that there is considerable improvement in the accuracy as well as speed with which messages are now transmitted; were it otherwise, it may fairly be presumed that the number of complaints would have very materially increased, since complaints are now encouraged, instead of remaining months unanswered; replies are now promptly rendered, and when demanded, every satisfaction is given as far as the rules of the department admit. So far, indeed, from resisting or deprecating complaints, the administration is grateful to any person who supplies information of any kind which may facilitate the detection and correction of faults of commission or omission, or in any way facilitate or improve the efficiency of the department.[23]

Again, the references to the situation now allegedly overcome – i.e. to the practice of 'resisting or deprecating complaints' – is telling about the state of affairs in the telegraph department in the late 1850s and early 1860s. While Robinson himself – at least in his reports – was absolutely positive that things were improving quickly, the public for some time would not concur in this view, as can, for instance, be seen in both the content and the tone of the following article. On Thursday, 20 October 1864, the *Friend of India* – published in Calcutta and one of the forerunners of *The Statesman* – reported on the state of the telegraph system in India. The substantial article opened with the following lines:

> It is a curious fact that the two public departments which in Europe and America have been wrought to the highest possible state of perfection are, in India, peculiarly conspicuous for defective administration and consequent inefficacy in the service of the public. The two departments to which we allude are the Post Office and the Telegraph.[24]

At the time of writing, of course, only the postal affairs were managed by government departments in either the United States or the United Kingdom. In 1864, the telegraph systems in both countries were still in private hands. That the article nevertheless refers to 'public departments' emphasizes the belief that it was the duty of whoever ran the postal and telegraph networks to provide a service to the public. Regarding the management of the Indian telegraph system, which had been under government management from its inception, there seemed to be room for improvement, in the opinion of the writer:

> It may seem scarcely fair to institute a comparison between the working of the telegraph lines in Europe and the administration of the telegraph department in

[23] Ibid., 5. [24] 'The Government Telegraph', *Friend of India*, 20 October 1864, 1175.

India; for, in the one case, there is private management and a vast number of competing lines, and, in the other, governmental administration and an entire absence of competition. But these facts can scarcely be set forth by the Indian government in excuse for the shortcomings of its own department, for we have, at all events, a right to expect that such experience as may be derived from the practice of home institutions shall be applied, so far as differences of local peculiarities will permit, in India. As far as we have been able to discover, this is not done in the instance to which we are now alluding. On the contrary, we have little hesitation in asserting that of all the departments of the Indian government in this country that of the Telegraph is the most mismanaged. This is saying a good deal.[25]

The author moved on to say that there was 'a good deal of hard work done in the principal offices of the department, but it is, for the most part, work in the wrong direction'. He eventually came to the condemning

conclusion that, taking it all in all, the telegraph department is about as thoroughly bad as it well can be. The plant is bad, the organization defective, the directing power misapplied. The result is failure. We do not know of a single line in India that can be really depended upon. For commercial purposes the telegraph in India is practically of no value.[26]

The last two lines point at the heart of the problem. In order to become a valuable instrument for investors and merchants, the telegraph needed to be reliable. Investments, sales and purchases could not be made on a potentially imperfect information basis. While speed in transmission was, of course, an important asset for the business community, it helped little if there was a constant uncertainty as to whether a telegraphic message actually reached its destination. The reasons for the unreliability of the system were manifold and could be found, among other factors, in the unsuitable technical specifications of the system itself, the at times extreme climatic conditions and the only basic training of signallers and clerks that often did not suffice to guarantee a smooth working of the communication process. In order to justify the condemning conclusion reached, the author of 'The Government Telegraph' then provided an example of the doubtful working of the telegraph system that referred precisely to the last factor:

A few days ago a gentleman had occasion to despatch a telegram from one of the most important stations in the North-West. The clerk in charge of the office was a native; and, from the importance of the station, it might have been expected that he would at least have been an intelligent native. The message was clearly and legibly written upon the usual form. This is what the clerk did with it. He counted the words and stated the cost of the message. But when, at the sender's suggestion, he tried to read it he could not do so. It was read over to him, but still he failed to comprehend

[25] Ibid., 1175. [26] Ibid., 1175.

it, and it was not until it had been thrice repeated to him that he was able, even imperfectly, to spell over the words of the message. This is an incident that would be scarcely worth recording except that it serves as a practical illustration of the inefficient instruments through which the telegraph is worked. Here, in charge of one of the most important offices in the country, was a man who whether you judged of him by his education, or by his speech, or by his knowledge of the English language, would not be admitted as a common writer into any mercantile office in Calcutta. Now, if we consider that the chief requisite of a signal clerk in the telegraph is a complete acquaintance with the language in which messages are transmitted we may, from this, come to some understanding of the numerous delays, errors, omissions, and blunders, that so constantly occur on the Indian lines.[27]

From the tone and choice of words in which this example is related to the reader, it seems not completely unreasonable to assume that the author might have entertained some prejudice against the intellectual capabilities of the native Indian population that informed his opinion on the employment of native clerks in the telegraph department. Therefore the entire example should be interpreted with caution, allowing for the possibility that the matter might well have been exaggerated. On the other hand, the central problem identified in the example – an only rudimentary knowledge of the English language – could, of course, seriously hamper the smooth working of the system when occurring on a larger scale. And around the time of writing the article for the *Friend of India* this problem seemed, indeed, to have peaked.

8.2 The growth of the Indian Telegraph Department network

In the following years, however, Robinson's small reforms appear to have yielded first results. Hiring competent and well-trained telegraphers gradually became easier and the quality of the service started to improve. In the administration report for the 1870–1 year, Robinson proudly stated that '[s]ix years ago, signallers in sufficient numbers were not obtainable. It even was difficult to retain the services of those we had; now, the demands for admission are so far in excess of our wants that we can afford to be particular'.[28] In the preceding paragraph, he had already found only the warmest words for those selected and in the service of the department:

Our signalling staff is in truth the backbone of our Telegraph Establishment. According to the evidence given before Parliament in 1866, the Indian signalling

[27] Ibid., 1175.
[28] British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1867–68 to 1870–71', 1871, 12.

staff was then deplorably ignorant and thoroughly incompetent. The status of education was then decidedly low, but that the lads only needed stimulus and opportunity to profit by instruction is manifested by the discontinuance of complaints, and the universal admission that the signallers work is now done very well. I have now little fault to find with them. I believe that the Government now possesses a thoroughly reliable body of signallers, contented, generally well conducted, and far better educated than is usual with men of their class.[29]

This significant improvement in the training and in the motivation of the staff is also reflected by the department's records on transmission errors and complaints by the public. The administration report also contained figures that depict development between 1867 and 1871 in these two fields.[30] The number of errors occurring in the transmission of telegrams in the Indian inland system decreased from 4,526 in 1867–8 to 2,938 two years later, while the total number of messages dispatched grew from 337,022 to 499,946 in the same period. Relatively speaking, this marks a drop in the percentage of errors from 1.342 to 0.587. In 1870–1, the number of errors increased significantly again and reached a percentage of 0.81. Robinson, however, was very keen to point out that 'this is due to the scrutiny in the Check Office having, under better management, become much more searching, and not to any real falling off in efficiency'.[31] This, of course, explains the pronounced increase in errors in 1870–1, but it also casts some doubt on the accuracy of the figures for the previous years, as the responsible officers seem to have applied rather slack quality standards in their search for errors. The number of complaints by the public, however, confirms the general development of the quality of service. Regarding the Indian inland system, the number of complaints peaked in 1868–9 at 618 and then fell significantly to only 312 in 1870–1. Given the rising number of total messages, this amounts to a drop from 0.18 per cent to 0.06 per cent of all paid messages and indicates real improvement in terms of the quality of the service.

The above-mentioned rise in the total number of messages handled already hints at the fast growth of the Indian telegraph system that had begun in the late 1850s. Regarding the structure of the network, the experience of 1857–8 brought about a quick expansion of the system.[32] Both the lengths of lines and wires and the number of telegraph offices increased substantially directly after 1858 and sustained a reasonable growth rate thereafter. By 1860–1, the Indian state telegraph system had

[29] Ibid., 12. [30] Ibid., 54–5. [31] Ibid., 54.
[32] British Library, Oriental Collections, IOR/V/24/4288, 'Administration Report of the Indian Telegraph Department for 1900–1901', 1901, 8–9.

reached a total length of almost 18,000 kilometres of line and only a few hundred kilometres more of wire. Messages could be posted at 145 telegraph stations in the colony. In the following decades, the network grew mostly continuously at rates that usually were in the range between 2 per cent and 5 per cent annually. Every few years this equilibrium was punctuated by an explosive expansion of the system. The 1864–5 administrative year, for instance, brought about an increase in the lengths of lines and wires, as well as in the number of stations, of more than 12 per cent. Here, the network was expanded particularly in the Bengal, Bombay and Madras 'circles', completing lines, for instance, from Titalya to Gowhatty, from Ajmere to Deesa, or from Mercara to Mangalore.[33] During the late 1860s, the length of lines in operation saw little expansion, but the length of wires and the number of stations grew pronouncedly. The capacity of parts of the network increased accordingly and access became easier. Another example can be found in the 1871–2 year, during which telegraph lines increased by almost 10 per cent in length compared to the previous year, while the length of telegraph wires increased by almost 25 per cent. During this year, 'between Bombay and Madras a thoroughly good line ha[d] been erected along the Railway, providing perfect communication for the through traffic between the cables'. And furthermore, '[t]he construction of a line along the Chord Line of the East Indian Railway ha[d] shortened the distance between Calcutta and Bombay and Kurrachee – a great desideratum – and has rendered communication between these important places secure'.[34] Another similar surge in expansion occurred a few years later in 1879–80, when the length of lines grew by 14 per cent and that of wires by more than 20 per cent. From the early 1880s onwards, the network then started to grow much faster on average, sporting annual growth rates of up to 8 or 9 per cent for several consecutive years. At the same time, access to the system improved significantly through the introduction of combined postal and telegraph offices. This measure led to a more than doubling of the number of offices in the three years between 1882–3 and 1885–6. Growth rates in all structural categories remained high throughout the rest of the nineteenth century. By 1900–1, the Indian telegraph system consisted of more than 88,000 kilometres of line, most of which contained more than just one wire and therefore supported a total of 293,189 kilometres of wire. Almost

[33] British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1862–63, 1863–64, 1864–65, and 1865–66', 1866, 37–8.

[34] British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1871–72', 1872, 6.

2,000 postal or telegraph stations were now open to the public and provided access to the system. This accounts for a continuous structural growth of the Indian telegraph network in the four decades after the Indian Uprising – even if the network could not compare by far with those of the telegraphically well-developed countries in Europe and North America.[35]

Regarding the use of the system, reliable and comparable data becomes available from 1866–7 onwards. It seems that Robinson's optimism about the steady improvement of the service in the late 1860s and 1870s was reflected in customers' rising trust in the system (see Table A.24 in the Appendix).[36] Throughout this period, the number of paid inland messages grew substantially at rates between 12 and 21 per cent annually. Almost all of this growth was generated in the private sector and not by state use of the telegraph. Generally, this development continued throughout the nineteenth century (leaving aside a few exceptional years with no or minimal growth). In the 1900–1 administrative year, about 5.5 million paid inland messages were transacted by Indian Telegraph Department offices and forwarded over its wires.

Given its modest origins in the 1850s and 1860s, this number constitutes a remarkable expansion of the use of the network. In comparison with European or North American networks, however, the use rate is meagre. In the same period, the French system handled more than seven times the number of telegrams, Western Union in the United States more than eleven times and the British government telegraph more than fourteen times.[37] Considering the size of the territory and of the population of the subcontinent, it becomes very clear that the telegraph in India catered to a very select part of the populace.

Starting in the 1867–8 administrative year, the Indian Telegraph Department's reports also contain information on average transmission times between the principal cities of the subcontinent. On practically all important connections, transmission times significantly improved in the closing years of the 1860s.[38] While in 1867–8 it took almost eighteen hours on average for a telegram posted in Calcutta to reach Karachi, the

[35] ITU Archives, Bureau international des administrations télégraphiques, 'Statistique générale de la télégraphie', 1900.

[36] British Library, Oriental Collections, IOR/V/24/4288, 'Administration Report of the Indian Telegraph Department for 1900–1901', 1901, 8–9.

[37] See Wenzlhuemer, 'The Development of Telegraphy, 1870–1900'.

[38] British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1867–68 to 1870–71', 1871; British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1872–73', 1873; British Library, Oriental Collections, IOR/V/24/4286,

average transmission time on this central route had dropped to just under two hours only four years later. Another five years on, such a message reached its destination in less than one hour. Improvements of a similar magnitude can be found on practically all other major lines, such as the Calcutta–Bombay, the Calcutta–Madras, the Bombay–Karachi or the Bombay–Madras routes. Transmission times along all these lines dropped massively between 1867 and 1871. This, again, confirms the beneficial effect of Robinson's adjustments in the service.

From about the mid-1870s onwards, transmission times continued to shrink throughout the remainder of the century but at an altogether much lower (and sometimes temporarily reversing) rate. But then there was a sudden rise of transmission times on practically all routes in the 1899–1900 year. Communication times between many major cities again reached lamentable values of between thirty and more than sixty minutes in this year, and thus roughly equalled the average of the mid-1880s. However, this increase does not indicate an abrupt deterioration of the service but rather stems from the coincidence of two unrelated factors. First, it had been 'the practice in previous years to calculate the maxima [*sic*] time intervals on messages transmitted by the direct routes only. From the beginning of the year 1898–99, the time intervals on messages transmitted by alternative routes on account of pressure of traffic on direct routes have also been taken into account'.[39] As telegraphic traffic in India was not particularly high during the 1898–9 administrative year, these changes in the statistical method are not directly reflected in the average transmission times for this year. Due to the lack of traffic pressure, alternative routes rarely had to be used. In the following year, however, inland traffic practically exploded and grew by more than 15 per cent. The number of state telegrams increased significantly due to 'the arrangements necessary for the despatch of the Indian Contingent to South Africa' and the mobilization of the force in this regard.[40] At about the same time, private inland telegrams also multiplied around 'the middle of August, when probably the failure of the rains in certain parts of India had been realised [and] speculation in the prices of grain became acute, causing an exceptional increase in traffic'.[41] Both these events led to rising traffic pressure on the main routes and therefore to an increased resorting to alternative routes. In combination with the change in the statistical

'Administration Report of the Indian Telegraph Department for 1880–81', 1881; British Library, Oriental Collections, IOR/V/24/4288, 'Administration Report of the Indian Telegraph Department for 1899–1900', 1900.

[39] British Library, Oriental Collections, IOR/V/24/4288, 'Administration Report of the Indian Telegraph Department for 1899–1900', 1900, 21.

[40] Ibid., 6–7. [41] Ibid., 7.

method, this brought about the significant surge in transmission times for the 1899–1900 administrative year. This episode, however, also testifies to the fact that by the end of the nineteenth century, India was eventually hosting a generally reliable and cross-linked telegraph system that could cope with exploding traffic numbers when need arose. In the three decades leading up to 1900, the network had been systematically expanded and technically improved. Access had been facilitated for private customers and, accordingly, network use had grown continuously throughout this period.

8.3 Indian Telegraph Department network structure in 1871–1872

Despite the sustained growth of the British Indian telegraph network in the late nineteenth century, both its structural density and the degree of telegraph use in India was minuscule when compared to most European countries or the United States. British India lagged far behind in terms of lines and stations per unit of area and also regarding the number of telegrams transacted per head. For instance, British India reached only about 9 per cent of the European average density of lines per unit of area and 1 per cent of stations per unit of area in the year 1870. In the same year, the number of inland messages transacted per inhabitant amounted to only 1 per cent, while foreign messages per head were rounded down to 0 per cent of the corresponding European average.[42] This significant lag in development can only be explained by looking at both the geographical and the demographical preconditions as well as at the purpose of the network. First, of course, the sheer size of the subcontinent and its large population both posed a formidable challenge to constructing a tight network of sufficient length that was accessible at many telegraph stations. To some extent, this distorted the per-area and the per-head measures and led to overly low figures in these categories when compared to a European average. Second, and even more importantly, the telegraph in British India was an imperial endeavour born out of the demands (and fears) of colonial administrators. Therefore it catered primarily to the needs of a very small group of officials, soldiers, merchants, financiers and newsmen who were by no means equally distributed throughout the subcontinent. The British Indian telegraph network therefore had not been designed to spread evenly across the colony. From its beginnings, it concentrated mainly on the important administrative and business centres and connected these with each other. While such a focus on the

[42] See Wenzlhuemer, 'The Development of Telegraphy, 1870–1900'.

centres is, of course, quite common in the European context as well (as has been seen in previous chapters), in British India the communicational gap between the few centres and the hinterland is much more pronounced than, for instance, in Europe in general or in Great Britain in particular.

In late nineteenth-century India, the telegraph only very rarely left the central axes of communication in order to reach out into the less-central regions. This can be seen both in the structure of the network and in its use figures. While the next section will be concerned with the latter, the former is the subject of this section. In the following, a network analysis of the British Indian telegraph network as it stood in the 1871–2 administrative year will be conducted. This particular time of observation has been selected for three reasons. First, the Indian Telegraph Department network reached a first stable working state in the early 1870s. By this time, the overall structure of the network had been laid out and the most urgent improvements had been made. While the following decades would bring further gradual development, a level of reasonable manageability and reliability had been achieved by that time. Second, the time of observation is reasonably close to 1868 – the only year for which comprehensive network information for the British telegraph system is available. The following analysis is, therefore, chronologically close enough to the study conducted in the previous chapter to allow for a direct comparison of the two cases. Third, sufficiently accurate and cross-referenced data is available for this year that renders a structural as well as a use analysis possible. In combination with use data for the 1872–3 administrative year, the structural data can be contrasted with individual information on foreign and inland traffic as well as on the total traffic split into sent, received and transmitted categories – all within an observational period of two years.

The data, which informs the following network analysis as well as the use study in the next section, stems from the administrative reports published by the Indian Telegraph Department. Therefore it covers only the government-run part of the British Indian telegraph network. However, private railway lines operating in the subcontinent also maintained telegraph lines along their railway tracks. While co-operation and the interchange of messages between the various railway companies seems to have worked quite well, this was more problematic between the government and the railway systems. In the combined administrative report for the years 1867–8, 1868–9, 1869–70 and 1870–1, Robinson comments on this point in the following words:

> The extravagance of having two lines of telegraph on the opposite sides of the same Railway when one would suffice, and the absurdity of the two systems, both

supported out of Indian Revenues, competing against each other for the favor of the public, instead of being combined together to serve the public in the best possible manner, are too obvious to require any lengthened demonstration, indeed, so obvious that one would suppose that, considering the intimate relations that exist in this country between the Government and the Railway, there would be less difficulty in effecting their removal than in almost any other part of the world. Not so, however, although all over Europe and in England since its telegraphs have come under State management, the Railways carry messages for the public only as agents for or as servants of the State, and only over those short lengths which are not provided with a Government Telegraph, in this country the vested interest of the Companies, and the impatience of control of the agents and representatives of the two great Companies, have effectually resisted the arrangement of this important question.[43]

As becomes clear from this statement, two practically independent telegraph systems with only very little contact co-existed in British India. Message exchange between them was absolutely minimal. The administration report for the 1871–2 year gives the number of messages transferred in both directions. Altogether, only 19,528 messages were handed from the railway telegraph operators to the government telegraph officers during that year. And even fewer than that, just 13,305 telegrams, were transferred in the other direction. In the case of the former, this amounts to 2.8 per cent of all messages posted at government stations in that year. Regarding the latter, it is 1.9 per cent of all messages received at government stations.[44] Contact and, thus, division of labour between the two systems were, indeed, minimal. Both networks were largely isolated from each other. And, as Robinson in the first sentence of the above extract indicated, the two systems mostly ran parallel to each other in geographical terms as well. Map 8.1 depicts both the Indian Telegraph Department lines existing in 1871–2 and the railway lines operating in British India by 1875–6. Completed government lines are shown solid, while railway lines are dashed for private companies and dotted for state railways. As can clearly be seen, the state telegraph and the railway network were almost completely congruent. At times, the railway lines diverted slightly from the telegraphs as they called at more and smaller intermediary stations. And in South India the railways, indeed, catered to a region that had largely been bypassed by the state telegraph. Yet, all in all, the two systems worked along the same axes and provided telegraphic communication to the same cities and regions. Due to both the isolation and the congruence

[43] British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1867–68 to 1870–71', 1871, 16.
[44] British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1871–72', 1872, 35.

of the two systems, an analysis of only one of them – in this case of the government telegraph network as compatible data exists only here – does make sense and produces valid results.

In the structural analysis of the Indian Telegraph Department network existing in 1871–2, 268 stations and their connections have been considered. The information on their position in the various government circuits has been extracted from Annexure III of the Administration Report of the Indian Telegraph Department for the Year 1871/72, entitled 'Classification and Description of the Lines of Telegraph in India, British Burmah, and Ceylon, as They Stood on the 31st March 1872'.[45] The connections between these 268 government stations have been entered into a data matrix which forms the basis for a social network analysis looking at the degree, betweenness and eigenvector centrality measures. The visualization of the government and railway telegraph network in Map 8.1 already quite clearly suggests that the structure of the British Indian telegraph system in the early 1870s differed quite markedly from that of contemporary Western networks, for instance the British network discussed in some detail in the previous chapter. While the British network centred quite pronouncedly on London – and to a lesser extent on the industrial north of England – the British Indian network seems to have had no obvious centre. It featured clearly discernible circuits and communicational axes but had practically no cross-connections between these. The distribution of degree centrality within the network confirms this preliminary visual analysis.

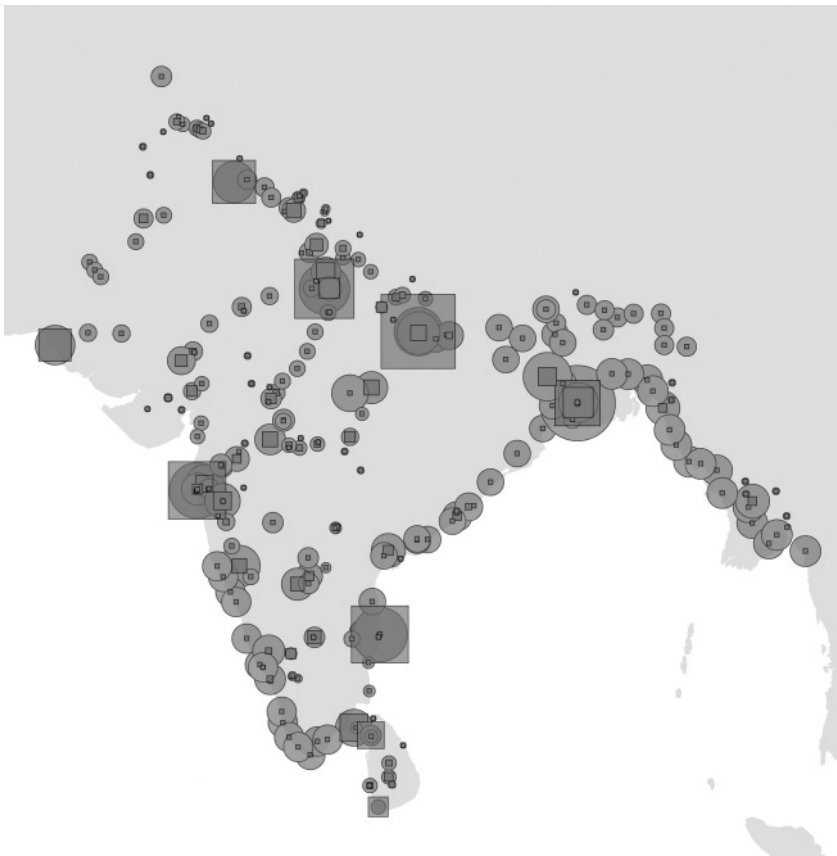
Calcutta is the only node in the network with a degree value (48) significantly higher than those following (see Table A.25 in the Appendix). Bombay, Madras, Barrackpore, Agra, Allahabad and Raneegunge all exhibit values in the range between thirty-five and thirty. Ranks nine (Nynee) to nineteen (Bezwarrah) still feature degree values between twenty-six and twenty. From there it is a very gradual decline to the town of Sylhet, which still has a degree of ten and ranks 120th. For comparison, London Central in Electric's network exhibits a degree value of 343. These results testify to the fact that the telegraphic circuits in India do not branch out much, concentrate on their principal routes and – most importantly – have almost no cross-connections between each other. There are only few alternative routes or direct circuits in the system. As visualized by the circles in Map 8.2, degree centrality is also relatively evenly distributed across the subcontinent, with centres at the eastern coast (Calcutta, Barrackpore, Madras), the western coast (Bombay) and

[45] Ibid., Annexure III.

inland (Agra, Allahabad). While Calcutta occupies a *primus inter pares* position, it does not have values high enough to qualify as the single hub or gatekeeper of telegraphic traffic in India. The degree analysis confirms that there was no central switch, no control station in the British Indian system. Rather, this function was relatively well distributed among the colonial centres.

The results of the betweenness analysis further support the above findings. The five nodes with the highest betweenness values are all among the top degree nodes as well (see Table A.26 in the Appendix). Interestingly, however, the inland towns of Allahabad (22.9 per cent)

Map 8.1 Telegraph lines of the Indian Telegraph Department (1871–2) and railway lines (1875–6) operating in British India. Note: Government telegraph lines are shown as solid; private railway lines as dashed; state railway lines as dotted.



Map 8.2 Freeman degree and betweenness centrality in the Indian Telegraph Department network, 1871–2. Note: Circles represent degree; rectangles represent betweenness.

and Agra (17.9 per cent) exhibit the highest values. The coastal centres of Bombay (17.4 per cent), Madras (17.2 per cent) and Calcutta (13.5 per cent) follow at ranks three to five – with Calcutta's betweenness significantly lower than that of the other nodes. This has been visualized in the rectangles in Map 8.2. It confirms the findings of the previous paragraphs and underlines that the British Indian government network knew no central switch and featured no single gateway or control centre. The even distribution of betweenness in the network shows that the network structure was quite balanced. While there were almost no cross-connections between circuits, the few alternative routes available

were connected in a decentralized and geographically spread-out fashion that increased the durability of the network at least in a modest way. Several nodes shared responsibility in the British Indian network.

The Bonacich eigenvector centrality measure produced data of only limited usefulness. With 46.4 per cent normalized eigenvector, Calcutta ranks highest, followed by Barrackpore (37.6 per cent) and Raneegunge (26.2 per cent). All the following towns are nodes on the Calcutta–Moulmein circuit and seem to potentiate themselves statistically. The British Indian telegraph network was comparably tight around Calcutta, and the city sat at the centre of a number of important connections. Therefore the eigenvector centrality of Calcutta is plausible. The high values of the Calcutta–Moulmein stations, however, seem to be a statistical oddity.

8.4 Indian Telegraph Department network use in 1872–1873

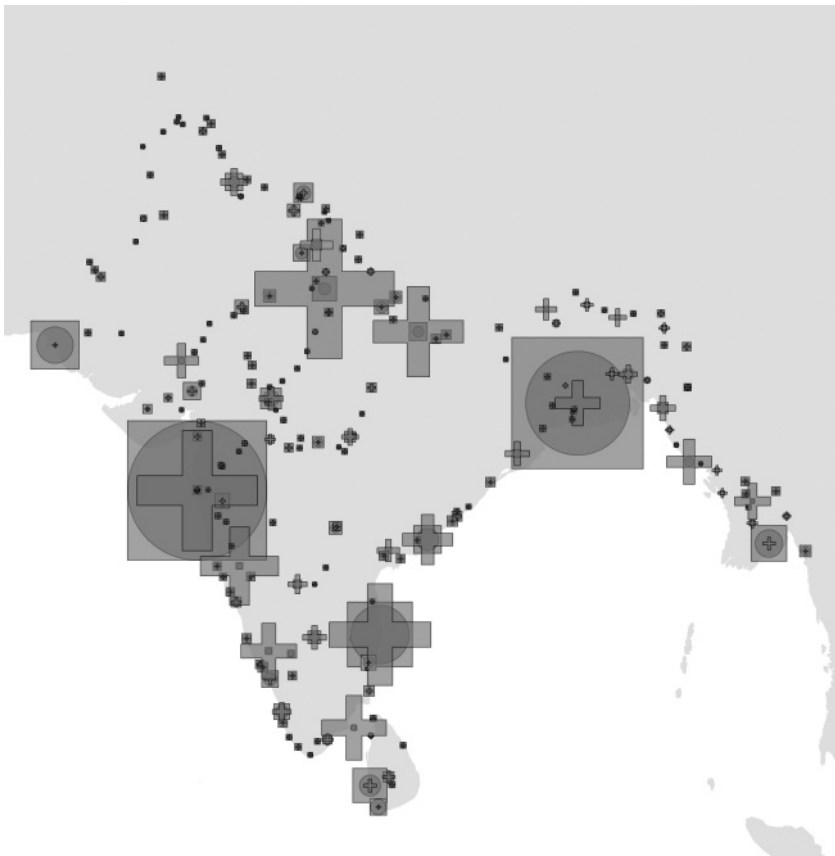
The findings discussed in the previous section clearly confirm that the British Indian government telegraph network did not emerge as an answer to the real or perceived needs of the public – a public, of course, that consisted mainly of people with an interest in business – as it did, for instance, in the United Kingdom. There, the telegraph network structure obviously reflected the perspective of a thriving business community that placed London at the centre and then needed a seemingly endless number of direct connections all across the country. In the case of British India, the network structure mirrored a more specific administrative purpose and exhibited a design developed on the drawing board rather than shaped by market forces. Such a design fulfilled the interests of the colonial government in the most economical way possible. As was seen in the first section of this chapter, these interests, from the very beginnings of the system, also encompassed the needs of the merchants and financiers operating out of the principal cities of the subcontinent who were crucially important to the British administrators. At the same time, however, concentration on the principal cities and important communication axes also limited the capacity, durability and attractiveness of a network system that thrived on the existence of cross-connections, alternative routes and ready access. At the time of observation in the early 1870s (and for a long time thereafter), the biggest parts of British India and its populace remained completely untouched by the telegraph. The already existing gap between centre and periphery, urban and rural India, therefore, widened with the increasing use of the telegraph. Active market participation outside the population centres became even harder when market information

travelled over the wire. In short, the British Indian telegraph network of the nineteenth century was designed with the needs and demands of a very small elite community of colonial administrators and mostly white businesspeople in mind and clearly reflected this in its structure.

While the British Indian telegraph network of the late nineteenth century strongly concentrated on connecting the principal centres of the subcontinent, and thereby further enhanced a prevailing integration gap within the colony, the network in itself – as has been shown above – had no particular control centre, no central switch or gateway comparable to the role of London in the United Kingdom's network of the time. The examination of the available network use data presented below, however, produces different results. Network use was by no means evenly distributed within the system but rather concentrated in and around a handful of metropolises in British India – namely Bombay, Calcutta and Madras, as well as, to a smaller degree, Karachi and Rangoon. This section draws on two different sets of information on telegraphic traffic in the British Indian network. The government department's administration report for 1871–2 lists 217 telegraph stations according to the administrative division they belonged to. The list contains information on the number of telegrams sent, received or transmitted at each individual station.[46] In the report published one year later, Appendix H consists of a 'List of Offices arranged according to the number of paid Sent Messages during the year 1872–73' that contains 212 telegraph stations with data on the inland and foreign messages sent from there.[47] In combination, these two data sets allow for a relatively refined and differentiated analysis of telegraphic traffic and its distribution within the British Indian system in the early 1870s.

The distribution of messages sent and received within the British Indian state network is very similar (see Table A.27 in the Appendix).[48] In both cases, Bombay and Calcutta handled by far the largest portion of traffic. Madras ranks third and is followed at some distance by Karachi and Rangoon. At Bombay, 120,638 telegrams were posted in 1871–2 and 88,579 were received. For Calcutta, the corresponding figures are 89,171 and 83,582. This means that, taken together, the two cities account for 29.9 per cent of all telegrams sent from all 217 British Indian government stations included in the list and for 24.1 per cent of all messages received there. The top twenty nodes within the network

[46] Ibid., 26–33.
[47] British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1872–73', 1873, 49–51.
[48] British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1871–72', 1872, 26–33.



Map 8.3 Messages sent, received and transmitted at stations in the Indian Telegraph Department network, 1871–2. Note: Circles represent sent messages; rectangles represent messages received; crosses represent messages transmitted.

together account for 61.7 per cent of all sent messages and for 57.2 per cent of all received. Map 8.3 visualizes this traffic concentration in and around the principal cities of the subcontinent. This imbalance was especially pronounced regarding the posting of telegrams, while at least a slightly higher proportion of messages was delivered to places outside the principal metropolises. All in all, however, a disproportionately high percentage of the total traffic in the network originated or terminated in three or four important cities. Often standing at the intersection of two or more telegraphic routes, these cities also saw much of the transit traffic

between different circuits. For these switching purposes, however, they were joined by other, lesser stations at places such as Agra, Allahabad, Belgaum or Paumben, where several important lines met. While the top twenty transit nodes together handled 80.2 per cent of all transit messages and therefore exhibited an even more extreme concentration than in the earlier categories, work was more evenly distributed among these nodes themselves. Regarding their role as traffic switches, Bombay, Calcutta and Madras were nodes like many others at circuit intersections. While enormous portions of the entire system traffic either originated or terminated in Bombay, Calcutta or Madras, these three places did not see much more through-traffic than many other stations at intersections. The stations at Agra and Allahabad, located on the Calcutta–Peshawar axis, handled a particularly high number of transit messages. There, important telegraphic routes to Bombay, Surat, Karachi or the south of India connected and produced transit traffic. This, in general, concurs with the findings of the network analysis above, but, of course, the concentration of transit traffic was much more pronounced than the structural analysis could ever have suggested.

Looking at the number of inland messages posted during the 1872–3 administrative year, the ranking corresponds closely to the list of stations handling most of the sent and received traffic a year earlier (see Table A.28 in the Appendix).[49] The traffic concentration also corresponds closely with the figures of the previous year. Bombay and Calcutta together accounted for 28 per cent of all messages sent. All twenty stations in the table handled 57.9 per cent of all inland telegrams posted in British India in 1872–3. In the case of telegrams sent from India to places abroad, the concentration of traffic in and around a handful of urban centres was even more pronounced. Again, Calcutta and Bombay easily lead the table. In these two places, 9,989 and 7,301 respectively of the 25,849 telegrams sent abroad originated. Taken together, this accounts for 66.9 per cent of the total. The top twenty nodes handled 95.3 per cent of all the messages to destinations outside India. Outside the principal centres of the subcontinent, practically no foreign telegraphic traffic was handled. Map 8.4 displays the number of telegrams sent inland and abroad in correct proportions and reveals that only a minuscule part of the entire traffic handled by the British Indian telegraph system was destined for places abroad.

In short, both inland and foreign telegraphic traffic in British India was highly concentrated around only a very small number of principal

[49] British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1872–73', 1873, 49–51.

Map 8.4 Inland and foreign paid telegrams sent from stations in the Indian Telegraph Department network, 1872–3 (in proportion). Note: Circles represent inland messages; rectangles represent foreign messages.

administrative and business centres. Network traffic was, therefore, anything but equally distributed within the system. Unlike, for instance, the case of the British telegraph system, network structure and network use patterns did not correspond much with each other. While the structure – which presents the theoretical maximum potential of the network – knew no real centre or single privileged gateways, network use clearly revolved around only a few places and revealed the position of the key switches in the system. This non-correspondence between structure and use also stems from the fact that the British Indian telegraph system had been purposely designed with the specific needs of a small colonial elite in

mind, and therefore could not respond much to the demands of the wider public. The relation between structure and use, however, largely works through demand and supply, through the market. Ideally, real or perceived demand of potential customers is taken into account whenever the network is structurally reconfigured. In this way, the structure of an open network will, indeed, resemble – not fully but closely – the actual use of the network as demand for use shapes new structural developments. In nineteenth-century British India, however, this correspondence worked only within some very narrow limits. The structure of the telegraph network catered to the needs of the administration and the military in the first place. For this, it did not need a central switch or many seemingly superfluous cross-connections. Centrality was accordingly rather equally distributed in the network. Actual traffic, however, was produced in only a handful of business centres, which largely communicated with each other.

8.5 Communication between Europe and India

On 21 January 1886, *The Times* of London reported on the state of affairs in newly annexed Upper Burma. This short report is instructive, in several different respects, as to the importance and the different functions of telegraphy in colonial affairs. Since the Third Anglo-Burmese War in late 1885, the British troops in Burma had seen themselves confronted with local armed resistance against foreign rule. Referring to this, *The Times* article opened, 'Telegraphic communication between Mandalay and the lower province, which has been open for two days, is again interrupted, the wires having been cut by dacoits.'[50] The importance of the telegraph for the organization of British rule in Burma had thus been duly noticed by the local resistance movement. Furthermore, the article itself was based on a correspondent's report from Mandalay posted there on 19 January. Communication between Burma and London therefore worked quickly and enabled a stable and reasonably up-to-date flow of information to the British public. And the interest of just this public was certainly aroused more than usual by the further contents of the article, which would eventually trigger a whole flurry of telegraphic interchange between London, Calcutta, Rangoon and Mandalay. The article ended with the following passage:

> The Rev. Mr. Colbeck, the representative in Mandalay of the Society for the Propagation of the Gospel, has addressed a public protest to the Chief Commissioner against a recent attempt by the Provost-Marshal to procure

[50] 'Burmah', *The Times*, 21 January 1886, 5.

testimony against other persons from a Burman while he was covered by the presented rifles of a firing party. Mr. Colbeck, who has long been resident in Burmah, declares that such proceedings cannot fail to bring shame and discredit upon our name, nation, and religion.

The ghastly scenes which constantly recur in executions carried out by the Provost-Marshal constitute grave public scandals. The Provost-Marshal, who is an ardent amateur photographer, is desirous of securing views of the persons executed at the precise moment when they are struck by the bullets. To secure this result, after the orders, 'Ready,' 'Present,' have been given to the firing-party, the Provost-Marshal fixes his camera on the prisoners, who at times are kept waiting for some minutes in that position. The officer commanding the firing party is then directed by the Provost-Marshal to give order to fire at the moment when he exposes his plate.

So far no satisfactory negative has been obtained, and the experiments are likely to be continued. These proceedings take place before a crowd of mixed nationalities, and cannot fail to have a demoralizing effect on both soldiers and spectators.[51]

This caused a public stir in England and almost immediately led to questions in the House of Commons. In the Commons sitting of 25 January, the Secretary of State for India, Lord Randolph Churchill, answered several questions referring to the treatment of Burmese prisoners under martial law and to the conduct of Provost-Marshal Willoughby Wallace Hooper. Among other things, Churchill said,

With regard to the Questions asked me on Friday, I am sorry to say that the information in my possession is far from satisfactory. The Viceroy telegraphs to me that it is clear that the Provost Marshal has proceeded in a most unjustifiable manner; at any rate, in one case. That alludes to the case where evidence was sought to be extorted by placing a prisoner apparently under the fire of soldiers. The Viceroy says he has telegraphed to General Prendergast directing that if a prima facie case is made out against the Provost Marshal on either of the counts mentioned, he and other officers implicated are to be suspended from their functions, and, if proved to be guilty, to be visited with the severest penalty. Mr. Bernard telegraphs from Rangoon to the Viceroy that he is still investigating or asking for information at Mandalay as to the allegations with regard to the Provost Marshal photographing prisoners under execution.[52]

The telegrams, which the Secretary of State referred to, formed only a small part of the somewhat hectic communication between London, Calcutta, Rangoon and Mandalay that had unfolded after the report in *The Times*. The entire telegraphic exchange was later compiled as a parliamentary paper presented to the House of Commons and has, therefore, survived in its full length. Only a day after *The Times* article had been

[51] Ibid., 5.
[52] Hansard, vol. 302, cols. 314–17. 'House of Commons Debate', 25 January 1886.

published, Churchill had grasped the seriousness of the situation and telegraphed the viceroy at Calcutta:

> 'Times' yesterday reports Mandalay, 19th January, grave scandals at military executions in Burma through Provost-Marshal photographing prisoners at moment of execution . . . Please report circumstances at once, and, if in any degree true, gravest and most immediate action must be taken . . . Questions now pending in Parliament. These reports are creating a very unfavourable impression.[53]

Again a day later, on 23 January 1886, the viceroy sent a telegram each to Chief Commissioner Bernard at Rangoon and Lieutenant-General Prendergast in Mandalay. An extract of the former reads,

> I cannot believe that proceedings so contrary to what was proper and desirable should have taken place. Am telegraphing to General Prendergast in same sense. You will not fail to comprehend extreme gravity of foregoing subject. Effect upon public opinion in England, in Europe, and in India, if such transactions should have taken place, cannot fail to be most disastrous.[54]

Between 22 January and 1 March 1886, twenty telegrams were exchanged between the different parties involved in order to establish the exact facts of Hooper's alleged misconduct, to do some damage control and to prepare a formal court of inquiry into the matter.[55] Eventually, the court of inquiry held at Mandalay on 19 March 1886 came to the opinion that the 'conduct of Colonel Hooper ... has deservedly met with public condemnation. It reflects discredit on the army to which he belongs, and is damaging to the character of the British Administration in India'. Nevertheless, taking into account that Hooper 'had already suffered severely from the consequences of his actions', the former provost-marshal got away with nothing but a public reprimand.[56]

This episode is telling in many different ways. Most obviously, it highlights the ruthlessness with which the British in Burma acted against those whom they perceived and denounced as dacoits. Furthermore, the scandal around Provost-Marshal Hooper drew public attention to questions of morality and ethics regarding the application of a relatively new technology (in this particular case, photography). Most relevant to the purpose of this study, however, is the illustration of several of the different functions that the telegraph fulfilled in the context of communication between Europe and Asia, between the imperial metropolis and the colony. First, telegraphic communication had long become a routine feature of military

[53] House of Commons Parliamentary Papers, C. 4690, 'Burmah, No 2 (1886). Telegraphic Correspondence Relating to Military Executions and Dacoity in Burmah', 1886, 7.
[54] Ibid., 7. [55] Ibid., 7.
[56] 'The Charges against Colonel Hooper', *The Times*, 8 September 1886, 3.

and other strategic operations. The compilation of telegrams later published as a parliamentary paper shows that there existed a regular flow of information from Burma – sometimes via India – to England. Until the publicization of Hooper's questionable practices in *The Times* article, these messages were unidirectional updates on the situation in Burma sent from Asia to Europe only. The telegraph was, accordingly, used in a routine fashion to inform the higher echelons of colonial administration (in this case either in Calcutta or directly in London) about the strategic situation on the spot. Second, the telegraph could, of course, be deployed as an administrative tool. The Secretary of State's message from 22 January constituted the first message in the exchange sent in the other direction and changed the nature of the communication. The telegrams changed in tone, contents and purpose. The technology was now used to make urgent inquiries and to swiftly implement policies. It was employed in a mainly administrative fashion and provided the only means to resolve the issue – and its implications on public opinion back in England – fast and efficiently. This is all the more true as, third, reports about such grievances in the colonies also reached the British papers, and thus the British public, by telegraph. The original report in *The Times* was published only two days after the correspondent had dispatched his views in Mandalay. The flow of news between the imperial metropolis and the colonies also used the telegraph as a medium.[57]

Of course, telegraphy could also be employed in communication between Asia and Europe in ways not covered by the above episode. By far the biggest proportion of telegraphic traffic was produced not by governments or the press but by private persons, most of whom belonged to the business community. During the 1888–9 administrative year, for instance, state messages accounted for only about 2.6 per cent of messages sent via the lines of the Indo-European Telegraph Department (IETD). Press telegrams – including those of *The Times* of London handled under a special agreement – made up another 2.2 per cent. The remaining (rounded) 95.3 per cent of messages were labelled 'Commercial and Private'.[58] From the early 1870s onwards, all these telegrams between Europe and India could be sent over three different routes. Since 1865, it had been possible to communicate with India over a landline through Turkey that connected with the Indo-European Telegraph Department's cables at Fao (Al-Faw) near Basra. From

[57] For more background on this, see Bonea, 'The Medium and Its Message'.
[58] British Library, Oriental Collections, IOR/V/24/4290, 'Administration Report of the Indo-European Telegraph Department for 1892–93', 1893, 21.

there, the cable reached Karachi in several legs.[59] The so-called Turkish line, however, was notoriously slow and unreliable and,[60] in the eyes of the British administration, had the additional drawback of passing through territory not under direct British control. Relief came in 1870, when within only three months two new alternative routes to India were opened to the public. In January, the Indo-European Telegraph Company (IETC) inaugurated its landline service from London via Prussia and Russia to Tehran.[61] In Persia, the line connected with the system of the Indo-European Telegraph Department – with which it has often been confused due to the similarity of the names. While the IETD was operated by the British Indian government, the IETC was a private company led by Siemens. In March 1870, John Pender's British Indian Submarine Telegraph Company completed its cable connection between Suez and Bombay. In June, the Falmouth, Gibraltar and Malta Telegraph Company linked up with this connection and direct submarine cable communication between Great Britain and India became possible (with only a short stretch of landline between Alexandria and Suez in the circuit). Both these new lines presented serious competition to the slow and inefficient Turkish line and attracted much traffic immediately. Only two years after its opening, the Siemens line handled at least twice, sometimes up to five times, the monthly traffic of the Turkish line (see Table A.29 in the Appendix).[62] From April 1873, the administration reports of the IETD also contain figures for the Suez cable's traffic, and thus a fuller picture of the monthly telegraphic exchange between Europe and India emerges. By that time, the share of the Turkish line had dropped to under 10 per cent and the cable already handled a little more traffic than the

[59] Harris, 'The Persian Gulf Submarine Telegraph of 1864'; Farajollah Ahmadi, 'Linking India with Britain: The Persian Gulf Cables, 1864–1907' (unpublished PhD thesis, University of Exeter, 2003).

[60] See the statistics on average transmission times via Turkey, Tehran and the submarine cable given in the administration reports, for instance British Library, Oriental Collections, IOR/V/24/4289, 'Administration Report of the Indo-European Telegraph Department for 1873–74', 1874; British Library, Oriental Collections, IOR/V/24/4289, 'Administration Report of the Indo-European Telegraph Department for 1882–83', 1883; British Library, Oriental Collections, IOR/V/24/4290, 'Administration Report of the Indo-European Telegraph Department for 1889–90', 1890.

[61] Elisabeth Bühlmann, *La Ligne Siemens: La construction du télégraphe Indo-Européen 1867 – 1870* (Frankfurt a. M.: Peter Lang, 1999); Margot Fuchs, 'The Indo-European Telegraph System 1868–1931: Politics and Technical Change', *Berichte zur Wissenschaftsgeschichte* 13 (1990); Andre Karbelashvili, 'Europe–India Telegraph "Bridge" via the Caucasus', *Indian Journal of History of Science* 26, no 3 (1991).

[62] British Library, Oriental Collections, IOR/V/24/4289, 'Administration Report of the Indo-European Telegraph Department for 1873–74', 1874; British Library, Oriental Collections, IOR/V/24/4289, 'Administration Report of the Indo-European Telegraph Department for 1878–79', 1879.

landline. During the following years, Turkish line traffic further decreased, while the two other routes shared the remaining message volume in fluctuating but mostly equal proportions. The traffic figures also highlight the interdependence of the three routes. Between November 1875 and February 1876, for instance, traffic via both Turkey and Tehran increased explosively due to an interruption of the submarine cable connection. Between May and August 1877, service on the Siemens line was disrupted and more than 90 per cent of all Euro-Indian telegrams were transmitted via the Red Sea cable. Although owned and run by completely different entities, the different parts of the communication system depended very much on each other and reacted sensitively to all sorts of events and disturbances along their routes.

By the 1870s India had become well connected with Europe. The communication system was reasonably stable due to the existence of several fallback options. And, as can be seen in Map 5.2, the network was immediately extended further to the east. Another one of Pender's companies – the British Indian Extension Telegraph Company – opened cables from Madras via Penang to Singapore already in 1870. The British Australian Telegraph Company extended the connection to Batavia in the same year and on to Port Darwin in Australia in 1871. A connection to Shanghai and Hong Kong was inaugurated in that year as well. And Rangoon was linked with Penang in 1877. These are just a few examples of the growth of the global telegraph network to the east, in the course of which India developed into a veritable hub of telegraphic traffic between Europe and Australasia. Data in the 'Administration Report of the Indian Telegraph Department for the Year 1872–73' already reflects this development. The statistics on inland and foreign messages sent from India contain further information on international transit traffic that has not been discussed above (again, see Table A.28 in the Appendix). Accordingly, during the 1872–3 administrative year, the principal government telegraph station at Bombay handled 11,327 transit messages from Europe to what has been called the Far East. The station at Karachi transacted 2,049 such telegrams. And Madras saw 14,256 transit messages from the Far East to Europe.[63] Table 8.1 shows how telegraphic traffic was distributed between the Indo-European Telegraph Department's Persian Gulf cables (connecting with the Turkish line and the Indo-European Telegraph Company's route) and Pender's submarine cable system through the Red Sea. The submarine cable attracted a bigger share of the total traffic between Europe and India towards the end

[63] British Library, Oriental Collections, IOR/V/24/4284, 'Administration Report of the Indian Telegraph Department for 1872–73', 1873, 49–51.

Table 8.1 *Indo-European and Far East telegraphic traffic, 1873–4 to 1878–9.*

	Red Sea line		Persian Gulf line	
Year	Between India and Europe	Far East traffic	Between India and Europe	Far East traffic
1873–4	25,123	24,863	24,255	3,992
1874–5	31,608	23,892	31,761	4,354
1875–6	29,408	17,200	41,210	9,213
1876–7	56,862	23,977	37,415	4,950
1877–8	86,637	50,838	23,494	2,602
1878–9	81,605	56,549	27,799	3,655

Source: British Library, Oriental Collections, IOR/V/24/4289, 'Administration Report of the Indo-European Telegraph Department for 1873–74', 1874; British Library, Oriental Collections, IOR/V/24/4289, 'Administration Report of the Indo-European Telegraph Department for 1878–79', 1879.

of the 1870s. Regarding messages to and from the Far East, however, its position was unrivalled from its very opening. Table 8.1 shows that only a small share of the Far East traffic went through the Persian Gulf cables at all. In 1872, the individual companies operating the submarine connection between Europe and India had been merged to form the Eastern Telegraph Company. Likewise, a year later the companies controlling the extensions to the east of India had been united to create the Eastern Extension, Australasia and China Telegraph Company. The two co-operated closely and thus provided a direct connection in which telegrams did not need to be interchanged between differently owned companies. This was efficient and convenient for the customer and therefore attracted the biggest part of the Far East traffic, which was growing substantially throughout the 1870s and the following decades. Until the opening of the cross-connection between Africa and Australia via the Cocos Islands in 1901, practically all the telegraphic traffic between Europe and Africa in the west and East and South East Asia as well as Australia in the east had to pass through India at one point in time. The British colony had, therefore, become one of the central switches in the global telegraph network of the nineteenth century.