

First railway line opened between Bombay and Thane and Telegraph line in Calcutta

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Abstract

This paper examines how the development of the railway-telegraph viz railway line opened between Bombay and Thane and telegraph line in Calcutta, technological complex impacted the tenuous relationship between the rulers and those they ruled; the British and the Indians. India's first passenger train was flagged off on its maiden run between (later Victoria Terminus, now Chhatrapati Shivaji Terminus) and Thane — a distance of 21 miles covered in 57 minutes, at 3.35pm on April 16, 1853. Drawn by three engines, Sahib, Sindh and Sultan, the train lurched forward amid fanfare and celebration. modern rail operations of a developing superpower. Sign up here for GlobalData's free bi-weekly Covid-19 report on the latest information your industry needs to know. Despite beginning life as a by-product of British colonial rule, India's railways have come to define and shape the country over the course of the last century and a half. Tracks that were laid to boost a regime and fill the coffers of foreign investors evolved to support the country itself, forming a staggeringly vast network which you could call a jewel in the Indian crown. As Indian Railways (IR) celebrates the 165th anniversary of its first passenger service, we take a look back at some of its major highlights and chart its course to becoming one of the most prestigious rail providers in the world. 1853-1869: Launching passenger rail services Although rail services in India were initially proposed in the 1830s, historians cite 16 April 1853 as the kickstarter for India's passenger rail revolution.

In 1856 the British completed a 4000-mile Indian telegraph system. It connected Calcutta, Agra, Bombay, Peshawar, and Madras. The telegraph was the brainchild of a visionary inventor named William O'Shaughnessy, and it secured England's grip on India. O'Shaughnessy had gone to India in 1833 as a 24-year-old assistant surgeon with the East India Company. There he began experimenting with electricity. He invented an electric motor and a silver chloride battery. Then, in 1839, he set up a 13½-mile-long demonstration telegraph system near Calcutta. That was only two years after Samuel F.B. Morse built his famous demonstration system in the United States. But O'Shaughnessy was unaware of Morse's work. His telegraph used a different code and, at first, he transmitted the message by imposing a series of tiny electric shocks on the operator's finger. He also came up with another unique invention. He used a 2½-mile stretch of the Hooghly River, in place of wire, to complete the circuit.

Key words: British, India, rule, economy, railway, Portuguese, Calcutta, Bombay, telegraph

Introduction

On this date, the country's first passenger train set off on a 34km journey between Bombay's BoriBunder station and Thane. It consisted of 14 cars being hauled by three steam locomotives, and carried 400 passengers. The line was built through an alliance between the Great Indian Peninsular Railway (GIPR) – incorporated in 1849 – and the East India Company, which at that point ruled large swathes in India. Its success spurred subsequent launches of railways in Eastern India (1854) and South India (1856). Following the opening of the Calcutta-Delhi line in 1864 and the Allahabad-Jabalpur line in 1867, these lines were linked with the GIPR to create a 4,000-mile network spanning the width of India. This early era of passenger travel was primarily funded by private companies under a guarantee system created by the British Parliament, which ensured they would receive a certain rate of interest on their capital investment.

In total, eight railway companies were established between 1855 and 1860, including Eastern India Railway, Great India Peninsula Company, Madras Railway, Bombay Baroda and Central India Railway. 1869-1900: Famine and economic growth Following the Indian rebellion of 1857 and the subsequent liquidation of the East India Company, the British Raj reigned supreme in India. From 1869-1881, it took control of railway construction from external contractors and increased expansion to help areas struck by famine after intense droughts in the country. The length of the network reached 9,000 miles by 1880, with lines snaking inward from the three major port cities of Bombay, Madras and Calcutta. The 1890s saw the introduction of new passenger amenities, including toilets, gas lamps and electric lighting. By this point the popularity of the railways had skyrocketed and overcrowding led to the creation of a fourth class onboard. By 1895, India had started building its own locomotives and by 1896 was able to send its own experts and equipment to assist with the construction of the Uganda Railway. A plan for a rail system in India was first put forward in 1832, but no further steps were taken for more than a decade.

In 1844, the Governor-General of India Lord Hardinge allowed private entrepreneurs to set up a rail system in India. Two new railway companies were created and the East India Company was asked to assist them. Interest from investors in the UK led to the rapid creation of a rail system over the next few years. The first train in India became operational on 1851- 12-22, and was used for the hauling of construction material in Roorkee. A year and a half later, on 1853- 04-16, the first passenger train service was inaugurated between Bori Bunder, Bombay and Thana. Covering a distance of 34 km (21 miles), it was hauled by three locomotives, Sahib, Sindh and Sultan. This was the formal birth of railways in India. The British government encouraged new railway companies backed by private investors under a scheme that would guarantee an annual return of five percent during the initial years of operation. Once established, the

company would be transferred to the government, with the original company retaining operational control. The route mileage of this network was about 14,500 km (9,000 miles) by 1880, mostly radiating inward from the three major port cities of Bombay, Madras and Calcutta. By 1895, India had started building its own locomotives, and in 1896 sent engineers and locomotives to help build the Uganda Railway. Soon various independent kingdoms built their own rail systems and the network spread to the regions that became the modern-day states of Assam, Rajasthan and Andhra Pradesh. A Railway Board was constituted in 1901, but decision-making power was retained by the Viceroy, Lord Curzon. The Railway Board operated under aegis of the Department of Commerce and Industry and had three members: a government railway official serving as chairman, a railway manager from England and an agent of one of the company railways. For the first time in its history, the Railways began to make a tidy profit. In 1907, almost all the rail companies were taken over by the government. The following year, the first electric locomotive appeared.

With the arrival of the First World War, the railways were used to meet the needs of the British outside India. By the end of the First World War, the railways had suffered immensely and were in a poor state. The government took over the management of the Railways and removed the link between the financing of the Railways and other governmental revenues in 1920, a practice that continues to date with a separate railway budget. The Second World War severely crippled the railways as trains were diverted to the Middle East, and the railway workshops were converted into munitions workshops. At the time of independence in 1947, a large portion of the railways went to the then newly formed Pakistan. A total of forty-two separate railway systems, including thirty-two lines owned by the former Indian princely states, were amalgamated as a single unit which was christened as the Indian Railways.

Objective:

This paper seeks to unravel the economy and political impact of the railway line opened between Bombay and Thane and telegraph line in Calcutta

Railway and telegraph Genesis

In 1847, Lord Dalhousie took over as Governor General of India. Dalhousie showed real vision in developing public works. He initiated roads, canals, steamship service to England, the Indian railway, and a postal system.

Of course it was Dalhousie who saw the potential of O'Shaunessy's telegraph. He authorized O'Shaughnessy to build a 27-mile line near Calcutta. That was running so successfully by 1851 that Dalhousie authorized him to build a full trans-India telegraph. O'Shaughnessy finished it three years later. It was an amazing

triumph over technical and bureaucratic problems. By then O'Shaughnessy knew about the new English and American telegraph systems, but that was more hindrance than help. It simply meant he had to invent his own equipment to avoid patent disputes. He also had to work with local materials, environments, and methods of construction. He had to invent his own signal transmitter and create his own means for stringing lines. While the system was still under construction, it helped the British in the Crimean War. Three years later, the full system so networked British rule that it was decisive in putting down the Sepoy Uprising. One captured rebel, being led to the gallows, pointed to a telegraph line and bravely cried, "There is the accursed string that strangles us." So question nineteenth-century British colonialism if you will. There is much to question. But you can only admire O'Shaughnessy. He showed what one person can do by trusting the creative ability that's there to claim. He stands as a reminder that one person can make a difference.

John Lienhard, at the University of Houston, where we're interested in the way inventive minds work. The arrival of the telegraph in the mid-1800s was a significant event in the development of the signal systems that humans have used to communicate with each other. The earliest signaling systems were based on light or sound, such as smoke signals and drums. The first telegraph, which was not electric but optic, was created in 1794 by the Frenchman Claude Chappe who that year succeeded in sending a telegraph message over a distance of 15 kilometers. Chappe's telegraph consisted of a series of semaphores placed in elevated locations about ten kilometers apart. A message was sent from one semaphore to the next, where it was then repeated and sent on to the next and so on to the final destination. A Swedish pioneer in optic telegraphy was Abraham Niklas Edelcrantz, who somewhat later than Chappe developed a more advanced and faster optic telegraph system. This system included ten moveable shutters mounted on two posts. The various positions of the shutters created combinations of digits that could be translated with signal books into words and sentences.

The combination 2-4-0, for example, meant "general." As in Chappe's system, the stations were located about ten kilometers apart. The optic telegraph was important in military applications but the rest of society was little affected by this innovation. The electric telegraph, on the other hand, had a great impact on all parts of society – in business, for news distribution and for private correspondence. The foundation for this invention was provided by the Danish H C Ørsted's discovery of electromagnetism in 1820. Advances in this field then occurred rapidly. In 1832, a Russian diplomat named Schilling von Cannstadt came upon the idea of using an electric current produced by a magnetized needle. Five years later, two Brits, Cooke and Wheatstone, using Cannstedt's experiments as their starting point, constructed a working electric telegraph. At about the same time, the American Samuel Morse presented an even more sophisticated telegraph in which an electromagnet registered pulses of current on a strip of paper. The registration was based on an

alphabet created by Morse that consisted of various combinations of short and long pulses. Letters were formed by switching an electric current on and off using what was called a telegraph key.

Metal wire magic wand of telegraph

By using a metal wire, Morse messages could be transmitted over long distances in an instant. Although Great Britain and the US continued to lead development of the electric telegraph for the rest of the century, interest for the invention was great throughout the entire western world, and telegraph poles quickly became a natural part of the landscape. In 1851, an underwater cable was laid between Dover in Great Britain and Calais, France that connected the two countries' telegraph networks. In Sweden, the electric telegraph was introduced in 1853, and four years later, the telegraph network extended from Ystad at the southern tip to Haparanda in the far north of Sweden. By 1855, Sweden established contact with the European telegraph network via a cable across Öresund. The major underwater cable project was otherwise the Atlantic cable, which was drawn between Ireland, which at that time belonged to Great Britain, and the US. After several complete and partial failures, a working link across the Atlantic was established in 1866. The first message sent over the new link was about share prices on Wall St. During the premier year, only one telegram was sent from Sweden to America. It was just 20 words but cost no less than 378 riksdaler, an amount estimated to correspond to about SEK 17,000 in today's money. In 1870, an Indo-European cable link was opened over land from London to Calcutta. A Danish telegraph company combined a trans-Siberian telegraph line from St Petersburg to Vladivostock with an underwater cable to China and Japan. This long connection was completed in 1871. By the early 1870s, the electric telegraph network had been built out to encompass nearly the entire world. Telegraph services in India date back to 1850, when the first experimental telegraph line was established between Calcutta and Diamond Harbour.

The British East India Company started using the telegraph a year later, and by 1854—when the system opened to the public—telegraph lines had been laid across the country. The telegraph continued to thrive, in India and around the world, even after Alexander Graham Bell patented the telephone in 1876. For more than half a century, telegrams were sent over cable lines, but in 1902 (capitalizing on the work of Italian inventor Guglielmo Marconi) the Indian system went wireless. In India, as in the rest of the world, a trend toward digital communications that began with the advent of the digital computer in the 1960s, increasingly threatened the continued relevance of the telegraph. By the 1980s, the analog facsimile telegraph, perfected in the 1930s and used to send information over telephone and telegraph lines, was replaced by the digital fax machine. Fax—and later email—began to eclipse telegrams, regular mail and other earlier communications systems, a process that only accelerated with the rise of the Internet. In the 1990s, Indian telecommunications company Bharat Sanchar Nigam Ltd. (BSNL) took over the country's telegraph system from the Indian postal service.

Economy and social ramifications of the rail/telegraph

But the increasing dominance of email and SMS continued to take its toll on the newly privatized telegraph. Two years ago, faced with declining revenues, BSNL instituted the first telegram price hike in some 60 years. From three or four rupees (U.S. \$0.05 to \$0.07) for 50 words, the price of taar shot up to 27 rupees (U.S. \$0.47) for 50 words. Last March, in a last-ditch effort to cut costs, the company ceased international telegraph service. Despite these efforts to make the telegraph business financially viable, BSNL still posted losses of some 17 million rupees (U.S. \$290,000) during the last two years. When BSNL then asked the Indian government to support the telegraph again, the company was told to evaluate whether the system was still necessary. As a result, in consultation with the Department of Posts, BSNL decided to cease all services beginning July 15. A senior BSNL official told the Times of India that: “The telegram had lost its relevance. The basic idea of a taar was to send a message fast. Now SMS, fax and emails do that job.

With smart phones, people send and receive emails on the move. So when we sought government support to keep the telegram alive, we were asked to decide its fate on a commercial basis and hence will now be discontinuing the service.” The company plans to shift telegraph staff members to work with its modern-day successors, including mobile services, landline telephony and broadband. An official from India’s National Federation of Telecom Employees criticized the decision to shut down the telegraph, arguing that people in poorer areas of the country, who are unable to afford the Internet, computers or phones, still rely on telegrams. In addition, Indian courts had previously accepted only telegrams and telegram receipts as proof of evidence in civil or criminal suits. In the age of smartphones, India is only the latest country to bid goodbye to the telegram. Western Union, the dominant telegraph company in the United States since its founding in 1856, was reorganized as the Western Union Corporation in 1988 and refocused on handling money transfers and related services. In 2006, the company shut down its telegraph services for good. On the other hand, correspondents in Sweden and the United Kingdom still use telegrams for nostalgia purposes, and a dwindling number of countries—including Russia, Canada, Germany, Switzerland, Belgium, Mexico, the Netherlands, Slovenia and Bahrain—continue to offer full telegraph services. The rise of industrialization continued undiminished as the 19th century went on, with the result that people needed not only rapid modes of transport for themselves and their products, but also modern means of transmitting all kinds of news. Being able to transmit information reliably could be crucial in gaining access to colonies as well as linking with markets and trade partners. Making such communication a reality necessitated major investments in new technologies and infrastructure projects, many of which were offered and implemented by only a handful of specialized companies. New kinds of telegraph networks had been growing up throughout Europe since 1845.

The invention of electric telegraphy, which replaced the previous optical transmission of messages via visual signaling systems, brought a quantum leap in communication technology. Numerous companies became involved in the new field, including Berlin's Siemens & Halske. Long land lines that would permit fast communication between strategically important terminal points were of particular interest. The plan to build a telegraph line from England to India had repeatedly come up for discussion ever since the 1850s or so. Individual sections of the line had been built along the route as a result. But there was no reliable, uninterrupted connection until 1870.

Technological challenges

Even the technical ability to transmit information across such a long distance simply did not exist as yet. Yet the incentive to overcome these obstacles remained – because such products offered the promise of great profit. In 1850, the first experimental electric telegraph line was started between Calcutta and Diamond Harbour. In 1851, it was opened for the use of the British East India Company. The Posts and Telegraphs department occupied a small corner of the Public Works Department, at that time. The history of Indian telecom can be started with the introduction of telegraph. The Indian postal and telecom sectors are one of the world's oldest. In 1850, the first experimental electric telegraph line was started between Kolkata and Diamond Harbour. In 1851, it was opened for the use of the British East India Company. Subsequently, the construction of 4,000 miles (6,400 km) of telegraph lines connecting Kolkata (then Calcutta) and Peshawar in the north along with Agra, Mumbai (then Bombay) through Sindwa Ghats, and Chennai (then Madras) in the south, as well as Ootacamund and Bangalore was started in November 1853. William O'Shaughnessy, who pioneered the telegraph and telephone in India, belonged to the Public Works Department, and worked towards the development of telecom throughout this period. A separate department was opened in 1854 when telegraph facilities were opened to the public.

Telegrams sent by the signallers at Delhi warning of the rebellion were crucial to the British retaining their control over the Punjab, thus saving British power in India. 'The telegraph saved us', claimed Sir John Lawrence of the Punjab. The original statement by Montgomery, Judicial Commissioner of the Punjab, was, 'The electric telegraph has saved India', and it was he who received the telegram sent by William Brendish, Signaller, warning of the emeute at Meerut. There were serious technical flaws in the system. Defects in design were attributed to W. B. O'Shaughnessy's pride in claiming to be the pioneer of 'Indian' telegraphy. The first problem was non-insulation and many of the Indian telegraph lines were not insulated. Subsequently, he used his influence in England to patent the 'Brook Insulator',³ which was a vulcanite cap slotted into an iron hood with sulphur cement that proved useless in practice. Ceramic insulators were

established to be the best. These together damaged the system irrespective of the uprisings, and the uprisings were a boon in disguise for the department, which used reconstruction as an excuse for extensive modification in design and structure.

In 1866, the Director General of the telegraph attributed the bad working of the early lines to their being 'inflicted' with the Brook bracket and insulator, 'both of which are thoroughly unfit for the purpose for which they were designed.' O'Shaughnessy's obsession with his own method of insulation had other difficulties. Initially, he claimed to have dispensed with the need for insulation through the use of iron rods weighing as much as a ton to the mile, and Luke, writing in the 1890s, noted the existence in India of thousands of miles of circuit weighing half a ton to a mile.⁵ Though he then patented his own brand of insulation, blatantly contradicting his previous claim of the feasibility of non-insulation, he continued to prefer extremely heavy iron rods rather than wires. The problem with this was that the quality of the transmission of signals was very poor.

Consolidation of British power through railway and telegraph

A corollary of the argument that Britain gave India political unity and democracy is that it established the rule of law in the country. This was, in many ways, central to the British self-conception of imperial purpose; Kipling, that flatulent voice of Victorian imperialism, would wax eloquent on the noble duty to bring law to those without it. But British law had to be imposed upon an older and more complex civilisation with its own legal culture, and the British used coercion and cruelty to get their way. And in the colonial era, the rule of law was not exactly impartial. Crimes committed by whites against Indians attracted minimal punishment; an Englishman who shot dead his Indian servant got six months' jail time and a modest fine (then about 100 rupees), while an Indian convicted of attempted rape against an Englishwoman was sentenced to 20 years of rigorous imprisonment. In the entire two centuries of British rule, only three cases can be found of Englishmen executed for murdering Indians, while the murders of thousands more at British hands went unpunished. The death of an Indian at British hands was always an accident, and that of a Briton because of an Indian's actions always a capital crime. When a British master kicked an Indian servant in the stomach – a not uncommon form of conduct in those days – the Indian's resultant death from a ruptured spleen would be blamed on his having an enlarged spleen as a result of malaria. Punch wrote an entire ode to The Stout British Boot as the favoured instrument of keeping the natives in order. Nor did Britain work to promote democratic institutions under imperial rule, as it liked to pretend. Instead of building self-government from the village level up, the East India Company destroyed what existed. The British ran government, tax collection, and administered what passed for justice. Indians were excluded from all of these functions. When the crown eventually took charge of the country, it devolved smidgens of government authority, from the top, to unelected provincial and central "legislative" councils whose

members represented a tiny educated elite, had no accountability to the masses, passed no meaningful legislation, exercised no real power and satisfied themselves they had been consulted by the government even if they took no actual decisions. As late as 1920, under the Montagu-Chelmsford “reforms”, Indian representatives on the councils – elected by a franchise so restricted and selective that only one in 250 Indians had the right to vote – would exercise control over subjects the British did not care about, like education and health, while real power, including taxation, law and order and the authority to nullify any vote by the Indian legislators, would rest with the British governor of the provinces.

Conclusion

The uprisings of 1857 were a major turning point in the history of British rule in India and an equally major test for the telegraph system recently built in India. 1857 was a communication crisis of enormous proportions for the British in India, and the telegraph has conventionally played a redemptive role in the huge volume of narratives generated around the uprisings. These uprisings cannot be limited to the years 1857 and 1858, and they were still echoing in central India while the professional and English speaking literati were negotiating the founding of the Indian National Congress in the port cities in 1885. So the term ‘1857’ has a much wider meaning both in terms of content and extent than the evocation of a single year indicates: a similar example is the term ‘1789’ in the history of France (though Stokes preferred the parallel with 1848: a ‘failed revolution’).

Through the experience of building and operating the railway, Indians came to understand the railway and telegraph as their own technologies well before the eventual handover of control over the networks from the British. The reasons behind the British desire to retain their grasp over the networks included profit, power, and orientalist notions of socially advancing Indians, all at the expense of Indian taxpayers. This arrangement was problematic and ultimately facilitated the Raj's undoing, while revealing certain realities of British imperial rule.

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