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Electrification, urbanization, and politics: British Bengal to princely Cooch Behar

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Received: 20 September 2024 / Accepted: 16 October 2025 / Published online: 28 October 2025
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Abstract

"There was no electricity, in contrast with our brightly lit house in Dhaka, but I got used to living in the light of kerosene lamps—and doing my studies by it as well. If in my subsequent life I have shown a strong urban preference, this could be because I felt I had done my stint of rural living already." Thus, Harvard Professor Amartya Sen, recipient of the Nobel Prize in Economics, recalls his childhood days in Santiniketan during the 1940s (Sen in Home in the world, Allen Lane, New Delhi, 2021). The statement emphasizes the connection between electricity, a modern technology, and urbanity in the early twentieth century. The article is an attempt to understand how electric light and power facilities were established in several municipalities in the Bengal Presidency and how they subsequently grew and changed. The Calcutta Electric Supply Corporation, popularly known as CESC, played a significant role in the electrification of Calcutta. Can one identify similar private power companies in other municipal towns—Darjeeling, Burdwan, Khulna, or Malda? Could the electrification of colonial Bengal create new conditions? What impact does it have on the socio-political condition of the region? How was the production and consumption of electric supply and technologies, and the social and cultural engagements with and responses to electrification developed at the interfaces of numerous transnational and local channels? In recent years, the Indian princely states have become a focus of attention among South Asian historians. For a quick example, Barbara Ramusack examines the evolution of public and private medical services for women in Mysore, a state that has commonly been seen as 'progressive' and 'modern' (Ramusack, in Ernst, Pati (eds) India's princely states, Primus, New Delhi, 2010). The modernization of Cooch Behar, a princely state located in the northern part of British Bengal, started during the reign of Maharaja Nripendra Narayan (1862–1911). What was the policy of Cooch Behar State regarding electrification? How far was it going to be different from the electric power policy of colonial Bengal?

Keywords *Technopolitical* · Electrification · Urbanization · Colonization

1 Introduction

This article explores the triple engagement between electricity, urbanity, and politics in the context of British Bengal during the 1880s–1940s. It delineates the electricity generation and distribution timeline, first in Calcutta and Darjeeling, and progressively extending to several municipal towns in Bengal. It also illustrates the early history of electrification in princely Cooch Behar, situated in the sub-Himalayan region of eastern India. In doing so, the study makes the case that understanding technological projects like electrification

in a colonial setting requires understanding how regional differences and politics have influenced one another. The article shows how different historical actors—management of the private electric companies, colonial bureaucrats, the Indian middle class, including politicians and specialists, and native princes—acted in diverse ways and thus impacted the growth of illumination, municipalization, etc. Finally, the article highlights how electrical infrastructures remained susceptible to political control and intervention by shifting the focus away from viewing them as constantly functioning technological objects. How did electricity, primarily electric lighting, redraw luminous boundaries within the capital? What were the varied forces and interests that shaped the technological system during the electrification process? How did the entanglements of electricity-related technicalities impact the electrification in Bengal? How did

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the overarching politiceconomy impact this entanglement? Can one locate the deliberation of colonial hegemony and princely autonomy within the purview of electrification?

The following item appeared in a well-circulated news daily: “*TMC MPs on dharna over power supply at Jai Hind Camp*—Trinamool Congress MPs on Monday began a dharna at Delhi's Jai Hind Camp over electricity being disconnected to the settlement, which is dominated by Bengali-speaking migrants. The settlement lies between Vasant Kunj and the urban village of Masoodpur, with most of the around 5000 residents hailing from Cooch Behar. The power supply was cut off on July 8 by officials who came with Delhi Police and CRPF personnel, following a court order in an encroachment case” (*The Times of India*, Kolkata Edition, July 15, 2025). The migrant population from West Bengal found themselves at the heart of a political struggle between two influential political parties. However, the medium through which they were grilled was a technology—electricity. The local administration chose to halt two of the most essential civic amenities—power supply and water supply—in order to vacate the area that had been “illegally” encroached upon. Thus, improving illumination and comfort through technology is one of the strategies employed by political parties to gain an advantage. As a history student, I travelled back in time to explore the intricate connections between electricity, urban space, and political dynamics, taking into account the contributions of the colonial state, Indian princes, the middle class, and entrepreneurs in the context of the 1880s to 1940s.

2 From technosocial to technopolitical

I use the sociotechnical system approach developed by Thomas Hughes to examine the historical trajectory of electrification in colonial Bengal. He argued that historians need a more comprehensive analytical framework than just looking at the technical aspects of the built infrastructure to understand the development of large technological systems (Hughes, 1983, pp. 1–17). The infrastructure is shaped and constructed in part by organizations, the state of the economy, political order, and availability of resources, key individuals, decision-makers, and labourers. Colonialism also had a major role to play in a colonial setting (Macleod & Kumar, 1995). Thus, technology is not merely an isolated product; it is a component of a continuous network of objects, people, laws, institutions, scientific knowledge, technical know-how (codified and tacit), labour practices, and ideologies. In other words, South Asian electric infrastructure was designed and developed mainly as a technopolitical project. My examination of the technopolitical nature of the electrification programme underscores that technological development is not apolitical. When electricity was introduced in India, some specific modes of transformative

resistance shaped how it would eventually be used and given meanings by its users.

The final decade of the nineteenth century witnessed a prolonged debate and discussion on developing legislation to facilitate and deliver electricity in Calcutta, the then capital of British India. The outcome was the Calcutta Electric Lighting Act, 1895, which enabled the local Government to permit a utility provider to supply electricity for public and private purposes within the specified area of Calcutta. This statute limited the length of licences awarded to twenty-one years.¹ Colonel REB Crompton significantly contributed to modernizing India (Sarkar, 2020, pp. 120–125). He was referred explicitly by Messrs. Kilburn & Co., agents of Indian Electric Co. Ltd., registered in Britain, in their application to the Bengal government to provide electricity and power to Calcutta. In reality, they sought to distribute energy using overhead wires, which was completely foreign in India. The idea caused a lot of criticism even though overhead wires had been widely employed in America, Canada, and Britain. A section of the bureaucracy opined that the streets of Calcutta were mostly lined with trees that could pose a risk to overhead wires carrying powerful currents. However, Crompton was able to overcome the obstacles because of his connections with the bureaucracy.²

As the huge amount of electricity (two million units annually) to be produced by the private utility company could not be consumed for lighting purposes alone, they intended to supply a bulk portion of it to the Calcutta Tramway Company as well. They claimed that by using the trolley wire system of overhead conductors for tramways, the posts could be utilized to support arc lamps for street lighting in the years to come. J. R. Maples, managing agent of the tramway company, supported the electric utility provider, “If lighting and traction are each separately remunerative, it is obvious that their combination must give economy in production.” A special meeting of the commissioners of the Municipal Corporation was held at the Town Hall (May 7, 1896), to consider the applications of prospective power companies submitted to supply electricity within their jurisdiction. Following much deliberation, Messrs. Kilburn & Co. were granted a licence to provide electricity in the Calcutta region.³ They received a revised license from the provincial Government that included limitations on using uninsulated metallic, low-resistance returns for tramway operations, so excluding the use of electric supply in

¹ Government of Bengal, PWD, 1895, MPI Branch, File 5E/1 of 1895, Nos. 1–5, WBSA.

² PWD, Civil Works: Miscellaneous, November 1896, Nos. 7–46, NAI.

³ Government of Bengal, PWD, MPI, File 5E/1 of 1897, Nos. A 1–79, January 1897, WBSA.



general. It stressed that an inspector must regularly check the cables for the electric scheme to function effectively (February 1897).⁴ Thus, it is evident from the above discussion that safety concerns loomed large, and there were contradictions and contestations among the different sections of the administration and specialists regarding the installation of electric currents.

After securing the coveted license, the utility company changed its name to Calcutta Electric Supply Corporation Ltd., known as CESC. After a year, they filed an appeal with the Bengal government, requesting that they either grant a new license or amend the one they already had to expand the region so they could deliver electricity. The reason mentioned: “We are now receiving applications for supply to premises just beyond the limits of the district covered by our existing license...” J. W. Meares, electrical engineer of the Bengal government supported the power company. On the contrary, several municipal department officials were apprehensive as they intended to evaluate the power company's performance before expanding its monopoly in Calcutta.⁵ The utility corporation could not be stopped and successfully pushed for the passage of the Calcutta Electric Lighting Act, 1899, which authorized them to distribute electricity “by means of the low tensions, continuous current system, distributing by means of distributing mains.” The licence, however, did not grant them permission to install any electricity lines in the Hooghly River or to in any way interfere with the rights or authority of the Port Commissioners of Calcutta.⁶

In 1899, Curzon wrote an intriguing letter to the Secretary of State for India at the time recommending that the essential plants for installing electric light be purchased locally rather than importing them from Europe for Government House Calcutta, Viceregal Lodge Simla, Government House Naini Tal, and Government House Maymyo, the Lieutenant Governor of Burma's summer residence. He claimed that because the materials were typically sent from England, the local firms that would have to be employed without qualified government personnel would demand a heavy price and be motivated to find out that those materials weren't up to quality. Unfortunately, only the Bengal government had a qualified electrician who could supervise such electric installations, but there was no technical team to support him. It was next to impossible for him to personally oversee a number of installations in different parts of the country.

Therefore, the Government of India might, in the future, be permitted to engage with local firms for such electric installations. Changes were made to several bureaucratic segments to facilitate the transmission of electrical power in a new region.⁷ During the same time, a question emerged about the appropriate motive power for driving the machinery with steam or electricity while constructing the locomotive and carriage workshops at Kharagpur, Bengal Nagpur Railway. The railway board was authorized by the Indian Government to take a decision (1900). Their answer was electricity. In the official correspondence, Stanley Franklin, the electrical engineer of Bengal Nagpur Railway at the time, was thus quoted:

Electric light is undoubtedly the healthiest, coolest, and most convenient artificial light, and I anticipate that after paying the cost of generating, plus a reasonable amount to cover fair wear, and tear of the plant, electricity will compare favourably with any other form of lighting that may be required locally.⁸

A proposal was made to introduce electric power at the workshops of the Telegraph Department in Calcutta (1901). They wanted to buy the electrical plant locally from Messrs. Kilburn & Co. on an urgent basis. The utility company agreed to assist in installing the power plant. The Director General of Telegraphs emphasized that “the advantages of electrical over steam power are now so thoroughly recognized that it does not appear necessary to go into details to prove that in a place like Calcutta, where electrical power will be available close to our Workshop in a few months, it is best form of energy to adopt.” The Government of India quickly sanctioned the proposal including the local purchase of the necessary plant.⁹ There were more than just the official and semi-official circles that could hear the chest-thumping of a new technology. But it penetrated deeply into Indian society from the very beginning. The manager of the Bengal Silk Mills, located at Ultadanga, desperately appealed to the chairman of the Manicktollah Municipality when faced with difficulties in getting electric power to their premises (1905). The manager lamented that their factory was situated outside the Calcutta Municipality's jurisdiction, writing, “...a distinct hardship that we cannot have the same privileges as the Calcutta people because we are a short distance outside the boundary”. As CESC was also willing to provide electricity, he further requested that the chairman mediate between the Bengal government and the power company so

⁴ Government of Bengal, PWD, MPI, File 5Z/1 of 1897, February 1898, WBSA.

⁵ Government of Bengal, PWD, 1899, MPI, File 5E/3 of 1899, Nos. 1–11 of KW, WBSA.

⁶ Government of Bengal, PWD, MPI, File 5E/4 of 1900, Serials 1, 4–16, August 1900, WBSA.

⁷ PWD, Civil Works Miscellaneous, June 1899, Nos. 1–4, NAI.

⁸ PWD, Railway Construction, A Proceedings, April 1902, Nos. 212–136, NAI.

⁹ PWD, Civil Works-Miscellaneous, A Proceedings, August 1901, Nos. 5–11, NAI.



that they could get the comfort of electricity.¹⁰ This technological marvel impressed Calcuttans and its neighbours and distant places like Port Blair. W.R.H. Mark, the then Chief Commissioner of Andaman and Nicobar Islands and Superintendent of Port Blair, requested his counterpart at the Home Department, Government of India, to provide electric lights and fans in the European barracks and to the local club and officers' dining mess. A passage from his letter is perhaps relevant:

It will be a great boon to the British Infantry here if their barracks which have no punkhas are supplied with electric fans. I need hardly say that electric lights and fans in the club and mess will add considerably to the amenities of life at an isolated station, and will keep convict punkah-coolies out of the house, an obvious advantage in a place like a club and mess.¹¹

3 The visibility of electric infrastructure

In August of 1905, CESC wrote to the Government of India to ask whether they needed any additional power to illuminate the area while the Prince and Princess of Wales were in Calcutta. The concerned official responded by affirming that the Imperial Secretariat, Foreign and Military Secretariats, and other imperial buildings in Calcutta would be illuminated on the event of the planned royal visit on January 3, 1906, and "that Their Royal Highness will drive through the city to view the illumination." The budgetary allowance of Rs. 60,000 for establishing the Veterinary Institution in the Science and other minor departments for 1905–1906 would be reduced to meet the expected illumination cost of Rs. 86,063.¹² Thus, displaying the 'power' of electricity is more significant than building scientific institutions for the colonial Government. One salient feature of this technology is that it needs to be transmitted and distributed using wires. Despite being a century-old technology, wireless transmission of electric current over long distances has not been accomplished. Cables and wires are needed to transmit and distribute electricity, a requirement that made electrification in a densely populated city like Calcutta challenging. It was not an easy task either to generate and transmit electricity in Darjeeling, a hill station located at an altitude of 2000 m in the Eastern Himalayas. The power station was situated at Sidrapong (1897) and at the heart of this were two turbo-dynamos of 100 HP each (Crompton-Brunton Copper

Alternator) situated between the hospital and Kotwalla *jhora* (spring), about 3 miles from the town and 3500 feet lower. There were four types of aerial line in Darjeeling—(a) bare high tension line, (b) insulated high tension line, (c) heavy house lighting distribution, and (d) street and minor house lighting distribution.¹³ Colonel Crompton was instrumental in the installation of the country's first hydroelectric generating station driven by a water turbine. Later, Crompton's memoirs reveal his and his team's significant challenges while building the electric works (Crompton, 1928, pp. 164–165). John Meares, one of Crompton's subordinates and later an electrical engineer for the Bengal government, mentioned the difficulties faced while building the reservoir and transmitting electric current to the town in his autobiography (Meares, 1934, p. 69).

The topography of Darjeeling created considerable hardship. According to Major P. Cardew, an engineer with the Public Works Department, there was a genuine danger from the high-pressure wires above Darjeeling town and on the same poles as the low-pressure wires. His suggestion was "...these wires should either be laid underground or that they should be taken to the distribution points by lines skirting the town, or at any rate avoiding the crowded streets, and kept separate from the low-pressure lines." He further recommended establishing telephonic communication between the generating station and the township for safety considerations.¹⁴ Initially, the energy generated was exclusively used for street lighting and to illuminate private residences like the houses of the Cooch Behar Estate. A proposal was even made by the Darjeeling municipality to supply electric power to the tea gardens. The cost of supplying power would depend on two factors: (i) the distance of the garden from the generating station, and (ii) the actual brake horsepower required.¹⁵ While inspecting the electric installations in Darjeeling town, a series of discrepancies was identified by a group of electrical engineers constituted by the Bengal government in 1904. According to them, these installations had not been constructed in accordance with the existing rules and regulations. The municipal commissioners of the town decided to implement the necessary changes and modifications recommended by the committee. Subsequently, the Government of India provided the funds needed to the Darjeeling Municipality to execute the work.¹⁶ Following the renovations, the Lieutenant Governor of Bengal permitted

¹⁰ Government of Bengal, PWD, MPI, File No. 5E/2/1905, Proceed No. B, B 1–5 & KW, WBSA.

¹¹ Home, Port Blair, A Proceedings, July 1905, Nos. 1–3, NAI.

¹² Government of Bengal, PWD, MPI, File No. 11/12/1906, Proceed No. A A43 to 85, January 1906, WBSA.

¹³ Government of Bengal, PWD, MPI, File No. 5E/1/1904, Proceed No. A A1 to 37 & K.W., WBSA.

¹⁴ PWD, Civil Works Miscellaneous, July 1899, Nos. 6–9, NAI.

¹⁵ Government of Bengal, PWD, MPI, File No. 5E/1/1904, Proceed No. A A1 to 37 & K.W., WBSA.

¹⁶ Home, Municipalities, A Proceedings, March 1904, Nos. 53–54, NAI.



the Darjeeling Municipality to provide electricity within the limits of its jurisdiction.¹⁷

Lebong and Jalapahar, however, were not covered by this statute and were not receiving energy. A few years later, an agreement was made between the Military Supply Department (Government of India) and the Darjeeling Municipality to supply water and electrical power to the cantonments of Katapahar, Jalapahar, and Lebong. In addition, it was decided that this type of delivery would not be equated with a power supply to the general population. The Darjeeling Municipality was responsible for providing the Military Works Pumping Station with enough electricity to pump the necessary amounts of water to Jalapahar and Katapahar. The agreement stated that they were responsible for installing and maintaining a transformer at the pumping station, along with all the required high-tension switches and other equipment. They also provided a high-tension circuit, which would exclusively supply electricity for the cantonments.¹⁸ Meanwhile, a proposal was put forth to expand the Sidrapong hydropower station facility by constructing an additional plant. The modification guaranteed uninterrupted operation and increased the installation's overall efficiency. Permission was even granted to import machinery from England at an early date; "otherwise, the work cannot commence before the next rains."¹⁹

This technology triggered intense debate and disagreement among various government agencies and electric utility companies. In one such instance, Messrs. Nixon & Co. and John Fleming & Co., Bombay, applied to the Bengal government to supply electrical energy in bulk for essentially industrial purposes, which was the first of this kind in the province. They intended to supply electricity "on both sides of the river Hooghly from Uluberia and Budge-Budge on the south to the East Indian railway bridge across the Hooghly on the north, excluding the portion within the Municipalities of Calcutta and Howrah..." The Advocate General of Bengal objected as the proposal was not in compliance with the Indian Electricity Act of 1903. He claimed that the applicants appeared to have thought that since the rights they were seeking had been given for a number of large areas in England; they would also be awarded in India. The power corporations probably ignored the fact that the authority granted by the English Acts differed greatly from that granted by the Indian Act. Even CESC objected, as it might end their monopoly in the region. The Lieutenant-Governor

of Bengal, however, preferred to ignore such objections, as CESC had hitherto made any attempt to supply energy in bulk to mills and factories. Citing the objection of the Advocate General of Bengal, the Government of India advised their counterpart in Bengal to pass a special act to deal with the case—supply of electricity in bulk. Meanwhile, the applicants revised their original application removing the terms and clauses of bulk supply and resubmitted it to the Bengal government for consideration. Thus, Messrs. Nixon & Co. and John Fleming & Co., Bombay, were granted the Hooghly River Electric Licence, 1907, in order to provide electricity to the Hooghly River district of Bengal.²⁰ The Bengal government had something to offer CESC as well. The Calcutta Electric Licence, 1907, superseded all previous licences that had been granted to CESC. This was for the purpose of supplying energy for electric traction and for the general supply of energy to the public.²¹

Several interesting propositions surfaced when the Indian Government solicited feedback on the proposed Indian Electricity Bill, 1909, from various quarters. Sita Nath Ray, Secretary of the Bengal National Chamber of Commerce, specified: "In the former Act of 1903, energy was defined as electrical energy expended at a rate greater than 25 watts, which excluded electric energy in electric bells, telephones, etc.; but in the present bill the definition includes every use of electric power, and would have the effect of interfering with the use of energy in domestic and scientific apparatus, which can do no harm to the public, and with which the public has no concern. If the former definition is not restored, it will be necessary to take out a license even for an exhibition of the Rontgen rays." R.E. Winkfield, acting agent and manager of the CESC, emphasized that the development of the electrical undertakings in India was carried out by imported capital. The foreign electrical company might forfeit these ventures if the licence was not renewed, even after making significant investments. This is detrimental to the growth of the electrical industry. CESC also strongly objected to appointing an Indian as an electric inspector: "...both the Chief Inspector and Electric Inspector be chosen only if they had a theoretical training in England, and many years of practical experience in some of the large companies in England. At the present time a junior Electrical Inspector acts as a wiring contractor for the Government. We consider that he should be quite unbiased in that event of being referred to. If he is acting as a wiring contractor, he tends to be biased in favour of his own work. We suggest that only Europeans from Home be chosen, and that no native, Eurasian or

¹⁷ Government of Bengal, PWD, MPI, File 5E/1 of 1904, Serial Nos. 29–31, 34–38, September 1904, WBSA.

¹⁸ Government of Bengal, Municipal Department, Municipal Branch, File M 1-W/5, Nos. 9–11, March 1908, WBSA.

¹⁹ Government of Bengal, Municipal Department, Municipal Branch, File M 2D/2, Nos. 43–49, B Proceedings, December 1908, WBSA.

²⁰ PWD, Civil Works—Electricity, A Proceedings, May 1907, Nos. 1–19, NAI.

²¹ PWD, Civil Works—Electricity, A Proceedings, October 1907, Nos. 1–4, NAI.



country-born-and-bred European should be chosen. "A further striking observation made by the power company was the rising number of power thefts! The proposed bill, in the opinion of N.R. Mukherji, deputy magistrate of the Darbhanga district, would eliminate the dual system of control established by the previous legislation. It was recommended that the local Government be granted complete authority to oversee and authorize the production and distribution of electricity.²²

Around the turn of the twentieth century, electric tramways began to appear in Indian cities. However, even though this technology was widely used and significantly impacted everyday life, very little research has been done on the electrification of Indian tramways (Rao, 2022, pp. 99–120). Calcutta was the first Asian city to get an electric tram. The service began in 1902 between Esplanade and Kidderpore. Unlike Bombay and Madras, where the electricity supply companies were identical for public lighting and tramway traction, Calcutta used to get electric power for lighting and tramway traction from two different service providers (Mahaluxmivala, 1936). Throughout the course of our study, it frequently caused considerable upheaval in Calcutta's power politics. The Indian Government sought to protect the interests of the local authority as the purchaser in a combined undertaking for tramway traction and general power supply without impeding the expansion of the electrical industry (1910). At the time, the Government of India's electrical adviser, J.W. Meares, issued a memorandum with some workable suggestions:

There should, however, be no conflict between the law relating to tramways and that dealing with electric supply. If a man proposes to start an electric tramway, supplying it himself with electricity, the whole business—generating station and all—should be constructed under the Tramways Act, and the terms of purchase provided by the Act should apply. If he subsequently wishes to supply energy to other people and take out a license under the Electricity Act for that purpose, that Act should not affect the terms of purchase of any part of the tramway, including the generating station.

He further suggested a slight alteration in the existing Indian Tramways Act, 1886, by "enabling power to be given to construct electric tramways with their equipment and electric supply lines." In the opinion of CESC, the current Tramways Act was designed for horse traction and thus needed to be significantly reframed. Lawmakers from Bengal also suggested creating a new Electric Traction

(Tramways) Act that would not apply to tramways or railways.²³ The condition of the tramway tracks and tram cars drew considerable attention. An anxious Calcutta Municipal Corporation emphasized a thorough examination of the electrical apparatus attached to the tramcars and the overhead wires. They hired Mr. Reynolds, an electrical engineer, to carry out the inspection.²⁴ However, referring to the existing clauses, R.J. Browne, the electrical inspector of the Bengal government, raised an objection as the Calcutta Corporation had no powers to inspect the overhead equipment of the Calcutta Tramways. They were entitled to oversee the maintenance of the tracks and tram cars only. The responsibility of inspecting the electrical equipment rested with the Bengal government. Thus, after a thorough inspection of the existing 61 miles of overhead wires both in Calcutta and suburbs, he certified that "beyond some few defects, chiefly bearing on the crossing of signals and wires over the trolley wire, for which the Tramway Company are only indirectly responsible, the Company's overhead construction conforms to the requirements of the Indian Electricity Rules, 1911." By appointing him to manage an annual inspection of the tramway's electrical apparatus, the Bengal government altered the decision taken earlier by the Calcutta Corporation.²⁵

The legislators of Bengal were busy interpreting the different aspects of this technology. It attracted considerable criticism when Darjeeling Municipality levied certain charges for testing electrical installations at the Campbell Cottage in Darjeeling. As per the existing rules, the power companies and local bodies were not entitled to provide electricity to consumers' premises unless they were reasonably satisfied with the safety concerns. In the license holders' best interests, the electrical equipment ought to be tested. Therefore, an agitated Bengal government clarified that it was quite improbable that consumers would be charged at the whim of the municipal authorities for testing and other purposes.²⁶ But it was impossible to avoid accidents altogether. As the municipal engineer of Darjeeling reported (May 18, 1911), "...a fatal accident has occurred in connection with the supply of electric energy to Mr. Forstmann's estate. I have made a personal enquiry on the spot and find that at about 12–15 P.M. today a cooly was sent onto the roof of Mr. Forstmann's rink to stop rainwater leaks, that he slipped and caught hold of two bare copper wires carrying

²² Government of Bengal, PWD, MPI, File 1E/44 of 1909, Nos. 1–32 & KW, November 1909, WBSA.

²³ Government of Bengal, PWD, MPI, File 1E/8 of 1910, Nos. 24–35, March 1910, WBSA.

²⁴ Government of Bengal, PWD, MPI, File 1E/14/1911, Proceed No. A 1&3, July 1911, WBSA.

²⁵ Government of Bengal, PWD, MPI, File 1E/14 of 1911, Serial Nos. 5–9, December 1911, WBSA.

²⁶ Government of Bengal, PWD, MPI, File 1E/9, 1–5 of 11, B Proceedings for May 1911, 22–31, WBSA.



current at 220 V. He was pulled off, taken to the ground, and artificial respiration applied for about half-an-hour without effect. In a recent case against Mr. Forstmann for theft of electric energy, the wires in question were held to be his private distribution wires." A.N. McIntyre, the electrical inspector of the Bengal government, however, identified "the cause is attributable to the proximity of the bare conductors of the service line to the roof of the rink" and accused the Darjeeling Municipality because the service line had not been installed in accordance with the laws currently in place. A fine was charged to the municipality for the incident.²⁷ The defects in the service line were eventually remedied. The electrical inspector also certified that same: "The service line to the Rink on Beechwood Estate, Darjeeling, has been altered on lines of the second method specified in the order, and although not strictly in accordance with it, the service line may now be considered safe."²⁸

In Calcutta, owing to the steady increase in demand, several sub-stations were erected by CESC to cope with the situation. It was of utmost importance to introduce high-tension alternating current instead of working with direct current to meet the additional demand. In 1912, the power company built a central station with the most modern generating plant at Cossipore. While CESC proposed to erect an electric sub-station at the north end of Babu Bathing Ghat, which fell within the Fort William zone, the Calcutta police commissioner strongly objected (1915). According to him, if permitted, it would create a bad precedent for private firms obtaining public land for business purposes. The Bengal government differed, saying, "The sub-station is required for the use of the Port Commissioners in the public interest and not for the direct benefit of any private firm. An electric sub-station somewhere near this point to provide accommodation for plants to increase the power of the jetties is considered absolutely necessary..." After receiving the required approval from the Indian Government, the sub-station was built atop steel stanchions so as not to obstruct the use of the steps of the bathing ghat.²⁹ Although CESC enjoyed an absolute monopoly in the field of the power supply industry in Calcutta, its dominance was never uncontested. A committee was constituted by the Bengal government in 1916 to consider the charges levied by the CESC. The committee was of the opinion that there was scope for substantial reduction, but in view of the current turbulent times due to World War I, the Government's reduction of rates was

detrimental to the growth of the electrical industry.³⁰ Now, the chairman of CESC, P.V. Luke, wrote directly to the provincial Government of Bengal about their decision to reduce the flat rate by 1/4 anna per unit at the first instance, and, when the Bengal government expressed their dissatisfaction, CESC further reduced the rate from 3 3/4 annas to 3 1/2 annas per unit for a consumption up to 6000 units. The Bengal government replied, "The Governor in Council notes with satisfaction that this is the second reduction within the period of one year." (June 18, 1918)³¹ In this context, two separate but connected questions arose: (a) do the concession rates enjoyed by the Government adversely affect the public? and (b) does the Government's action in the matter of rebate in any way hamper the development of electrical undertakings and industries generally?

R.J. Browne, electrical adviser to the Bengal government, emphasized that if the Government had not patronized the power company from its inception, CESC could not have allowed the current concessions to be made to the public. Big consumers like the Government, with particularly large day-loads and therefore proportionately much smaller power-house equipment, were very profitable from CESC's point of view, while simultaneously benefiting the public by helping to reduce the cost of generation. Due to the lower production costs, CESC was even able to declare further rebates to big consumers like Baranagar Jute Mill. Reasonable concessions to the Government did not negatively impact the power supply company or the general public. He further refuted the charges made by the newly formed Electric Supply and Traction Federation about the lack of government support: "The Government of Bengal has always been sympathetic towards development of electrical undertakings. Their demand in regard to Government guarantee of dividends on capital is childish and does not merit much consideration. Electric supply undertakings, like any other business, must be run on commercial lines."³² From the perspective of technological expansion, the agreement signed between the Secretary of State for India and CESC for carrying aerial conductors across the Hooghly River is significant. By this agreement (1920), CESC was permitted to utilize their producing station, located on the east bank of the river in Calcutta, to supply electricity to specific areas on the west side of the river. Electricity was carried from the generating station to the other side of the Hooghly River using overhead cables, masts or towers erected on

²⁷ Government of Bengal, PWD, MPI, File 1E/13 of 1911, Serial Nos. 1–4, Nos. 1–6 & K.W., August 1911, WBSA.

²⁸ Government of Bengal, PWD, MPI, File 1E/13 of 1911, Serial Nos. 5–7, Nos. 6–8 & K.W., September 1911, WBSA.

²⁹ Government of Bengal, PWD, MPI, File 1M/3/1915, Proceed No. A 1–6, May 1915, WBSA.

³⁰ Government of Bengal, PWD, MPI, File 1E/4/1916, Proceed No. A 1–2, March 1917, WBSA.

³¹ Government of Bengal, PWD, MPI, File 1E-11, Proceed No. A 1918, July 1918, WBSA.

³² Government of Bengal, PWD, MPI, File 1-E—7, Serial No. 1 & 3, Progs. Nos. 6-7B, March 1920, WBSA.



the riverbank (foreshore).³³ The following year, the Indian Electricity Rules, 1911, were amended to include the following: (a) sufficient safeguards against lightning to be provided by the power company; and (b) licensee safeguards against electrical, mechanical, chemical, or other damage to the insulation, as well as the arrival of moisture.³⁴

The Dishergarh Power Supply Co. Ltd. was set up in 1919 to provide electricity to just four colliery companies operating under Messrs. Andrew Yule & Co. Located in the Burdwan division, the capital of the power company was raised entirely by the coal companies so that it could be mutually beneficial—"The energy supplied to them is charged at a rate which has been provisionally and experimentally fixed at a sum (much smaller than any rate charged by supply concerns established for profit) which is believed to be just sufficient to provide according to the estimated consumption of the coal companies and concerns." The Government immediately accepted the prayer of the power company to carry a supply line across Grand Trunk Road. However, Messrs. Kilburn & Co., managing agents of Coalfields Co. Ltd., objected to such sanction as they were supposed to provide electricity to the entire region except the collieries mentioned by the Dishergarh Power Supply Co. Ltd. However, the Bengal government provided the necessary permission to the Dishergarh Power Supply Co. Ltd. to generate electricity and supply it exclusively to the collieries mentioned in their application for a period of ten years.³⁵

4 Technology and transformation

The trajectory of technological development was not only determined by political ideology; individuals and establishments in positions of power, who had helped to forge nation-states, also made a substantial contribution. In the Madras Presidency, the strong political position of individuals like C.P. Ramaswami Aiyar, who was a great admirer and proponent of modern technological projects, influenced the initiation and development of the electricity system (Rao, 2010, pp. 59–66). Similarly, the local municipal bodies, along with some influential technocrats, played a very significant role in the electrification of Bengal as well. In 1925, the Uttarpara Municipality decided to enter into an agreement with the CESC for lighting with electricity portions of the area where the mains of the power company had already been

constructed, as well as those portions within the municipal limits where connections to the CESC may be extended in the future. It was further decided that one hundred twenty-five electric lamps would be installed, of which only one at the Grand Trunk Road would be 50-cd-power, the rest being 25-cd-power each.³⁶ An important decision was taken in a meeting held in March 1925 at Baranagar Municipality to decide whether the street lamps should be lit with gas or electricity. It appeared to the municipal commissioners that the maintenance charges for lighting with electricity would be much less than those for lighting with gas, and thus they resolved unanimously that the street lamps be lit with electricity. Accordingly, they entered into an agreement with CESC to install and maintain the street lights. It was further decided that two hundred and six electric lamps would be installed, each a 60-W or 50-cd-power lamp burning for 2500 h.³⁷ At the request of the secretary, Ramkrishna Anath Asram, located in the same municipality, the commissioners wrote to the Bengal government for necessary approval to exempt the organization from paying house and lighting taxes. It was decided that, with the approval of the local Government, the holding in question would not be subject to the house rate or lighting rate because it was an entirely charitable institution.³⁸

The Bally Municipality Chairman, Manomohan Mukherji, wrote to the Howrah District Magistrate regarding their decision to use electricity to light up the streets of the town where CESC had taken over their mains for commercial purposes (1927). They additionally developed a plan for the street lighting for this reason. He continued that the commissioners of the municipality would be happy to extend street lighting to the other major streets within the licensed area if the power company had agreed to extend lines to those streets free of charge. In the meantime, a section of the educated elites of Bally Municipality (Prasanna Kumar Smrititirtha and others) sent a petition to the Bengal government that raised certain pertinent issues regarding the introduction of electricity for street lighting:

- Those people (representatives of the municipality) have not explained to the uneducated (i) the future of the lives of themselves as well as their successors, (ii) economy of lighting kerosene oil lamps instead of electric ones, (iii) the initial expenditure of several lakhs of rupees for

³³ Government of Bengal, PWD, MPI, File 1-E-5, Proceed No. A 9-12, May 1920, WBSA.

³⁴ Government of Bengal, PWD, MPI, File 1E-21 of 1920, Proceed No. A 1-4 & K.W., January 1921, WBSA.

³⁵ Government of Bengal, PWD, MPI, File 1-E-1 of 1920, Proceed No. 1-22 & K.W., February 1921, WBSA.

³⁶ Government of Bengal, LSG Department, Municipal Branch, File M 4L-5, Progs. A 29-36, May 1926, WBSA.

³⁷ Government of Bengal, LSG Department, Municipal Branch, File M 2T-4, Progs. A 39-42, December 1926, WBSA.

³⁸ Government of Bengal, LSG Department, Municipal Branch, File M. 2T-16, Progs. B 22-24, April 1929, WBSA.



installation and other incidental charges, and (iv) development of rates per year.

- The people's economic condition is so straitened that they can hardly furnish oil for their earthen pots that are daily lighted up in their houses, and the imposition of tax for the new scheme would be an additional burden upon them.
- That, in view of the complete inability of the municipality to maintain most of the existing roads, even with cinders, whenever the Commissioners have not given any satisfaction to the ratepayers, the municipality should not be justified in moving to execute such formidable scheme in its jurisdiction.
- That if the Local Government itself have ever resolved to force the municipality to equip with electric installation to turn the place into a metropolitan town, without paying any least regard to the conditions of the lives of the general poor people at present economic stress, then your poor citizens will stretch their feeble hands to welcome the informal inauguration by the Government and will readily withdraw their habitations and put up to a less busy quarters of the province.

The Government, however, rejected the petition on the ground that none of the objections disclosed adequate reasons for refusing sanction to the scheme for introducing electric lighting into the Bally Municipality. The chairman of the municipality had something to offer his residents as well (1928). Upon the installation of electricity in the allotted area of Bally, up to two forty-eight kerosene lamps currently utilized there for lighting would be moved to the roads, which were presently underlit. Only the 'advanced portions' of the town would at present have electric lights, and the 'backward areas' would still continue to be illuminated with kerosene lamps, whose numbers must be increased to provide better amenities to the residents of those localities.³⁹

While executing the plan, it became apparent that a number of holdings belonging to the East Indian Railway and the Calcutta Chord Railway fall within the jurisdiction of the Bally Municipality. In order to levy a 'light tax' on the railway properties, the chairman of the municipality requested that the Bengal government negotiate with the governor-general in the council for necessary permission. The Railway Board made it clear in correspondence that they did not object to the lighting rate being imposed, except in the cases of the East Indian Railway holding at Lillooah, which was effectively lit by electricity at the railway's expense, and the temporary structures built for the Calcutta Chord Railway, which had its own electrical installation. This

time, Jyotsna Kumar Banerjee, Vice-Chairman of the Bally Municipality, emphasized that apart from the railway holdings, other private properties like factories and mills had their own installations but paid regular taxes to the municipality for electric lighting. He gave the specific example of the Howrah Municipality, where the East Indian Railway paid lighting fees, despite the railway having its own arrangements. Moreover, as the roads that led to the railway stations were lighted with electricity by the municipality and thereby provided amenities to railway passengers, the railway authorities, according to him, should pay the lighting tax. Subsequently, the provincial Government directed the Bally Municipality to enter into a contract with the railway administration to recover the lighting rate.⁴⁰

In 1920, the Burdwan Municipality entered into an agreement with Messrs. J.C. Banerjee & Co., Calcutta, to supply electric energy to Burdwan. However, for unspecified reasons, the firm did not finish the installation work until the town was lit with electricity at the end of 1926. When the proposal was first mooted, the commissioners of the municipality resolved that the imposition of a lighting rate was undesirable because the people had been paying the maximum house, water, and latrine rates. As individuals started using electric lights, the question of whether the municipality could use electricity to illuminate the streets without charging for it emerged. N. N. Sarkar, the then Advocate General of Bengal, opined that the Burdwan Municipality could meet the cost of lighting its roads with electricity from general revenues without imposing a lighting rate (1929).⁴¹ On another occasion, the District Magistrate of the 24 Parganas ordered the Tollygunge Municipality to update their plan to more closely resemble the South Suburban Municipality's after they announced their intention to install electric lights and sign an agreement with CESC, the service provider (1928). He also asked for an explanation regarding the proposed higher rates charged by CESC in comparison to the South Suburban Municipality. However, Purna Chandra Mitra, Chairman of the Tollygunge Municipality, repudiated the directive citing the following justification:

The plan cannot be revised on the lines of the South Suburban Municipality, because the area over which the electric lights will be installed in the South Suburban Municipality is compact. In contrast, in the case of this municipality, electric lights will be installed on different streets over scattered area. Hence, no boundary could be shown in the plan as is done by the South Suburban Municipality...

³⁹ Government of Bengal, LSG Department, Municipal Branch, File M 4L-1, Progs. A 30–42, November 1928, WBSA.

⁴⁰ Government of Bengal, LSG Department, Municipal Branch, File M 2T-2, Progs. A 8–24, January 1929, WBSA.

⁴¹ Government of Bengal, LSG Department, Municipal Branch, File M 4L-5, Progs. A 12–14, August 1929, WBSA.



The CESC corroborated his claim by emphasizing that it was not possible to fairly compare the lighting rates paid by the municipalities because Tollygunge's street lighting was dispersed throughout a very large area and that two depots would need to be maintained in Tollygunge rather than just one in the South Suburban Municipality (Behala district) in order to guarantee effective service. Another reason cited by the power company for the slightly higher rates was the recent all-round increase in the price of the lamps. This time, the Tollygunge Municipality's plan was accepted by the Bengal government.⁴²

Likewise, in 1931, the Bengal government accepted the plan to electrify a portion of the Dum Dum Municipality. The municipality signed an agreement with CESC to install one hundred and thirty-three electric lamps of 40 watts each in the designated areas.⁴³ Khulna Municipality proposed to install electric lights within certain areas under its jurisdiction, and accordingly, the municipal commissioners decided in 1935 to enter into an agreement with Khulna Electric Supply Co. Ltd. They further decided that the streets not only of the urban area but also of the important portions of the rural area should be illuminated with electricity. The period of contract between the municipality and the power company was twenty years, and as per the agreement, Khulna Electric Supply Co. Ltd. would be bound to increase the number of hours spent burning the street lamp if so desired by the municipality.⁴⁴ The municipal commissioners of the Rishra-Konnagar Municipality resolved in a meeting headed by the chairman, Narendra Kumar Banerjee, to light a portion of the town with electricity (1934). Subsequently, they entered into an agreement with CESC to install and maintain four hundred and thirty-seven electric lamps (60 and 40 watts, respectively). A two percent yearly lighting tariff was to be charged in order to cover the expense of electrification. Accordingly, the commissioners of the municipality passed a resolution that read: "The plan of lighting as finally adopted provides for adequate lighting of practically the entire residential quarter in Rishra and Konnagar and the question of further extension of lighting may be considered by the commissioners as the necessity for such arises" (December 14, 1935).⁴⁵

In order to impose an electric energy tax on lights and fans for uses other than industrial, philanthropic, and

religious ones, the Bengal Electricity Duty Act, 1935, was introduced. S.W. Redclift, Electrical Adviser and Chief Electric Inspector of Bengal, was nominated as a member of the Bengal Legislative Council to oversee the necessary technicalities. He was appointed to make all assessments on energy supplied by CESC. He was further assisted by the electric inspectors to inspect the whole of Bengal, including areas beyond the jurisdiction of CESC, the biggest power company in the presidency.⁴⁶ Regarding the progress of the electrical power industry, *inter alia*, the electrification of Bengal, Redclift made a significant observation:

As a rule, local authorities display some enthusiasm with regard to the possibility of providing electrical amenities within the areas under their jurisdiction but they do not give their whole-hearted support which is so essential if these small Electric Supply Companies are to carry on their work. Unlike other public utility works, electric undertakings, in Bengal, receive no financial support from the Government and it is essential that the local authorities should give their support, where possible, in the form of guaranteeing water pumping and street lighting loads at fair rates.⁴⁷

Thus, according to him, the role of the municipal bodies was very crucial as far as electrification was concerned. However, the relationship between the Calcutta Municipal Corporation, led by nationalist Indians, and the colonial British Government was not very cordial. Allegations had been made by the Bengal government that full details had not been provided about the electric works undertaken by the corporation. On one such occasion, it said, "It is bad electrical engineering to build up a generating and distributing system piecemeal and at haphazard instead of designing it as an economic unit." On another occasion, "Before the Corporation installs electric pumps, they ought to examine whether these are more economical than pumps driven by steam or oil engines, and when satisfied on this point they ought to examine whether it is cheaper to generate their own electricity or to buy it from the Calcutta Electric Supply Corporation." The Chief Executive Officer of Calcutta Corporation, J.C. Mukherjee, pointed out that while the Government didn't object to the substitution of electric power by the municipal body, it had apparently exhibited an unusual anxiety, if not concern, that instead of generating the electrical energy needed for their own requirements, the corporation

⁴² Government of Bengal, LSG Department, Municipal Branch, File M 4L-2, Progs. A7–14, February 1929, WBSA.

⁴³ Government of Bengal, LSG Department, Municipal Branch, File M 4L-4, Progs. A 8–13, October 1931, WBSA.

⁴⁴ Proceedings of the Government of Bengal, Local Self-Government Department, Municipal Branch, File no. M.4 of 1935, Progs. A 25–27, April 1936, WBSA.

⁴⁵ Government of Bengal, LSG Department, Municipal Branch, File M 4L-6 of 1936, Progs. A 49–57, March 1937, WBSA.

⁴⁶ *Annual Report on the Administration of the Indian Electricity Act, 1910, in Bengal for the year 1935* (Alipore: Bengal Government Press, 1936), 28.

⁴⁷ *Annual Report on the Administration of the Indian Electricity Act, 1910, in Bengal for the year 1933* (Alipore: Bengal Government Press, 1934).



should purchase it from CESC.⁴⁸ The role of the corporation inevitably infuriated European big business. From the perspective of European heavy industry, the bitter rivalry between the British-incorporated Calcutta Electric Supply Corporation and the Congress-controlled Calcutta Corporation was especially concerning (Sarkar, op.cit., pp. 176–81).

In this technological deliberation, not always colonial and national interests, but different technologies of illumination sometimes played a prominent role. The Calcutta Municipal Corporation constituted a special committee to consider the utility of entering into a fresh agreement with the Oriental Gas Company after the expiry of the present one for the supply of gas to light the public gas lamps. The committee closely examined the reports and statements obtained from several Indian and European municipalities with regard to the kind of gas used and the rate charged. They thoroughly investigated the pros and cons of using gas versus electricity for street lighting, considering both price and suitability. They discussed the matter with the representatives of both CESC and the Oriental Gas Company. The committee believed that, regarding illumination and cost, electric light was superior to gas. The challenge, nevertheless, was that replacing all of the gas lamps in Calcutta with electric ones would undoubtedly take several years. The committee found that it was not possible to adopt electricity as a general illuminant immediately on the expiry of the present agreement with the gas company. Therefore, they advised the corporation to enter into a fresh agreement with the Oriental Gas Company for a period of seven years.⁴⁹ However, the newly appointed chief engineer of the municipal corporation, Dr. B.N. Dey, strongly emphasized: "...if the gas lamps of the city were converted into electric lamps and each burner was replaced by 75-W electric lamps, Calcutta will get 51 percent better lighting, and the net annual saving to the Corporation will be about Rs. 365,000."⁵⁰ In 1937, to modernize the existing hydroelectric plants, which had reached their maximum generating capacity, the commissioners of the Darjeeling Municipality proposed to install another power house with diesel engine sets near Lebung. To meet the immediate needs of the town, they even started an informal negotiation with the Kurseong Hydro-Electric Works for the supply of about 200 K.W. Despite government approval, a section of the bureaucracy was highly critical to the proposal to extend the hydropower plants in the Darjeeling Municipality: "Apart from the actual estimates,

I desire again to place on record the unbusiness-like manner in which the Municipality has dealt, and still is dealing, with the question of the electrical development of Darjeeling; which is unfair to the public."⁵¹ Whether it was the best possible technological solution or contestation between different political ideologies and interests, electricity brought visible changes to the urban landscape of Bengal.

In this context, a report published in 1939 is worth a mention. The principal architect of this huge survey was S.W. Redclift, a special duty officer with the Electrical Department of Bengal. Discussing the electrical issues of Bengal insofar as they connected to existing undertakings was the goal. Other objectives included looking into potential new developments that could help support the expansion of industries, especially small ones, and bringing electricity amenities to as many people as possible. In 1928, there were only nine public electrical undertakings operating in Bengal. After a period of ten years, the number had increased to 57. However, Redclift emphasized that electrical development in Bengal had been slow except in Calcutta and coalfield areas, which clearly indicated the location of the principal industries in Bengal that used electricity. Half of the townships in Bengal, with populations of over 5000, were already illuminated with electricity. Thus, so far as the large 'Grid' scheme was concerned, Bengal had one advantage: the loads had already developed. With regard to the layout of electric supply lines, Bengal also had certain disadvantages: "The rivers, by the time they reach Bengal, are very wide stretches of water and, as is well-known, do not keep to the same courses. This has a bearing on any electric Grid scheme unless it be decided, in view of the geographical conditions, to split up the province into several large areas for the purposes of electrical generation and distribution."⁵²

Redclift believed that Bengal should be divided into five geographical zones to facilitate electrification.⁵³ So far as Bengal was concerned, and for that matter any other large tract of land that required extensive electrification, he further believed, a question of policy was involved, and on which the Government alone could take a decision. He urged policymakers to take up the immediate task of electrifying townships with a population above 5000. The development of the electrification of individual towns was essential, and Bengal had accomplished much in this respect. There remained, however, at least 53 smaller townships, each with a population over 5000, which, so far, had not attracted the attention

⁴⁸ Government of Bengal, LSG Department, Municipal Branch, File M 1C-31 of 1932, Progs. A 83–88, June 1934, WBSA.

⁴⁹ Government of Bengal, LSG Department, Municipal Branch, File M 1C-5, Progs. A 3–8, February 1932, WBSA.

⁵⁰ *Calcutta Municipal Gazette* XXIX, no. 4 (17 December 1938): 170.

⁵¹ Government of Bengal, LSG Department, Municipal Branch, File M 3L-6 of 1938, Progs. B 89–95, August 1939, WBSA.

⁵² *Preliminary Report on the position of electrification of Bengal with notes on other Provinces and Mysore State and suggestions for accelerating development in Bengal 1939* (Alipore: Bengal Government Press, 1939), 1–3, 5, 36.

⁵³ *Ibid.*, 37.



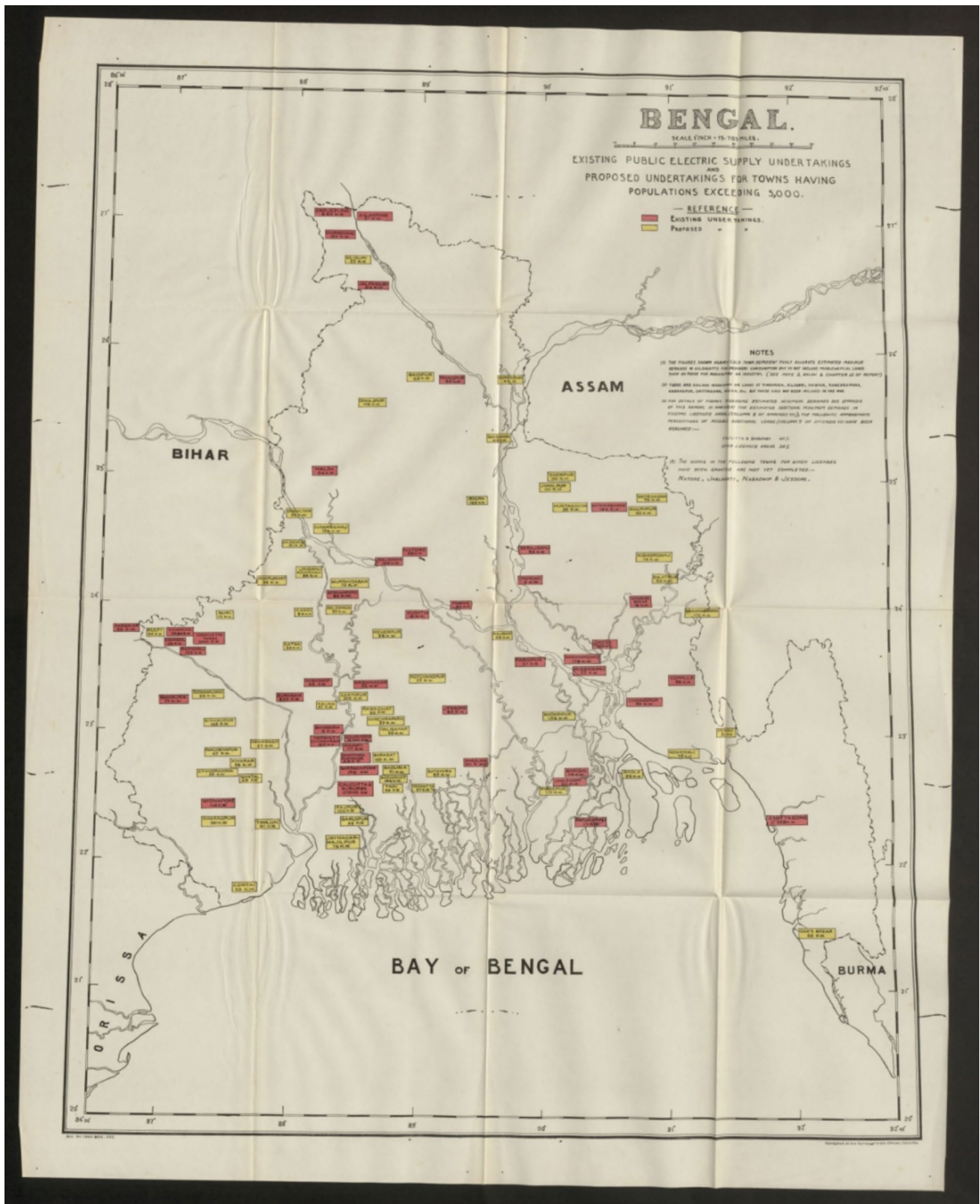


Fig. 1 Existing public electric supply undertakings and proposed undertakings for townships having populations exceeding 5000 in Bengal (1939). Courtesy: India Office Records, Asia, Pacific and Africa Collection, British Library, London



of the investing public. According to him, the Government should proceed with the electrification of these townships at an early date for three reasons: "The first is that it will bring the amenities of electricity to the notice of the public and make them electrically minded. Secondly, early development will provide useful loads for larger schemes that will take some time to implement. Thirdly, the procedure of electrifying many small towns, when considered with the existing undertakings now working appears to be a rational kind of development, namely, evolution instead of creation."⁵⁴

Electrification alone would not be sufficient to develop industries and agriculture. The Government would need to carry out propaganda and outreach programmes before the residents of the districts began to engage in small-scale enterprises or irrigation of crops that required electricity. He then asked a very pertinent question: whether the Government proposed to permit private capital to be invested or whether the Government ran the undertakings? Redclift believed these new undertakings must be owned by the government or municipal bodies. This was a debatable issue, and examples could be cited for and against, despite municipal and Government concerns that lacked the entrepreneurial spirit of those operated privately. The crucial issue of human resources in managing such electric undertakings finally arises. This time, Redclift was apprehensive:

Bengal, so far as I am aware, has not facilities at present for this important side of educational works. There are colleges and institutions for theoretical and laboratory instruction but in addition, practical and field training are essential. I strongly recommend that attention be given to this matter at an early date.⁵⁵

Such a confession from an insider with desired technical knowledge was a serious cause for concern. Even though the British Raj frequently disregarded the observations of the bureaucracy—particularly those of scientists and engineers—the records they produced are crucial reading for anybody writing about modern technological projects (Fig. 1).

5 The order of legitimacy: princely Cooch Behar

In recent years, historians of South Asia have shifted their focus towards the Indian princely states (Ramusack, 2004). A number of academics have recently argued that in order for the history of the Indian princely states to be more fully integrated with the body of knowledge on South Asia as

a whole, it must go beyond discussing the states' roles in the political, economic, and rhetorical designs of British colonialism as well as their nationalist endeavours. Rather, they contend that an examination of the social, political, and economic advancements in the Indian states is necessary, not just of the developments themselves but also in light of the colonial administration and opposition in British India (Ernst and Pati, 2010, pp. 2–3). Although the colonial hegemony had been established during the late eighteenth century in Bengal, Bihar, and Orissa, a portion of land was not painted pink on the maps of the British Empire—princely Cooch Behar. Some scholars, influenced by the notion of an 'alternative modernity,' examine health, education, and infrastructure efforts as examples of 'model' states that have come to terms with their sovereignty (Ghosh, 2011; Roy, 2014). The last subsection addresses one important component of infrastructural development—electrification—that has received scant attention in the burgeoning literature on the Indian princely states.

In order to repel the Bhutan ruling dynasty's onslaught, the kingdom of Cooch Behar signed a treaty with the British East India Company in 1773. Thus, the king of Cooch Behar became a feudal ruler under the British. Maharaja Nipendra Narayan (1862–1911) played a pivotal role in the modernization of Cooch Behar State. From the growth of modern education to municipal administration, from the development of modern communication to the implementation of public health measures, he was truly the architect of a welfare state in Cooch Behar (Pal, 2015, pp. 35–97). To provide better municipal services to the people of the state, a Town Committee Act was passed by the State Council of Cooch Behar in 1885. It was responsible for managing street lights. The yearly administrative report for 1895–1896 made it clear that there were just 76 street lamps. Every night but the ninth of each month, these were lit. Four *chut-tacks* of oil per lamp each night were allowed, at an annual cost of Rs. 1292–12.⁵⁶ When the expensive chandeliers in the public rooms of the royal palace were shattered due to an earthquake, Maharaja Nipendra Narayan decided to introduce electric lights in 1897. Following the signing of an agreement between Messrs. Osler & Co. and the Cooch Behar state, construction began in earnest on the north wing of the palace.⁵⁷ Two years later, the palace had been fitted with electric lights at a total cost of Rs. 39,136, which didn't

⁵⁴ Ibid, 41.

⁵⁵ Ibid, 43.

⁵⁶ *Annual Administrative Report of the Cooch Behar State for the Year 1895–1896* (Cooch Behar: Cooch Behar State Press, 1896): 36.

⁵⁷ "The contract provided that all charges for freight and local labour and material should be borne by Your Highness, in addition to the contract sum of Rs. 40,000; and a sum of Rs. 1393 was expended in this way during the year." *Annual Administrative Report of the Cooch Behar State for the Year 1897–1898* (Cooch Behar: Cooch Behar State Press, 1898): 22.



include the cost of lighting up the Durbar Hall with electricity.⁵⁸ But not everyone was likely pleased with the advent of electric lights. Sunity Deveen, the Maharani, noted in her autobiography (Sunity Deveen, 1921, p. 144):

The rains are very trying in Cooch Behar; all the rivers and tanks are flooded, and the insects! I don't think my Western readers will believe it, but we have more than a thousand different kinds of flying insects, and since we have electric light, they have been worse than ever. My husband used to have dinner inside a sort of mosquito curtain room in order to escape from the pests.

Although the royal palace was illuminated with electricity at the beginning of the twentieth century, oil lamps continued to be the primary source of street lighting in several municipalities of Cooch Behar even into the first decade of the 1900s. It is evident from the annual administrative report of the state for the years 1909–1910 that the Sudder Municipality had 97 street lamps as against 8, 22, and 26 street lamps, respectively, for the Mathabhanga, Haldibari, and Dinhata municipalities.⁵⁹ A scheme for extending the supply of electricity in the town of Cooch Behar and the purchase of additional machinery came up for consideration in 1925. Prior to making a decision, it was deemed prudent to obtain professional counsel due to the issue's significant financial stakes and technical nature. The state's political agent was permitted to request authorization from the Bengal government to confer with the Government's electrical advisor over the plan. Given the urgency of the situation and the delay in obtaining the necessary authorization, it was ultimately decided to contact Messrs. Octavius, Steel & Co., Calcutta, on the issue at hand. They were asked to send a delegate to Cooch Behar in order to investigate the local conditions and requirements and then produce a comprehensive electrification scheme for consideration. The report was submitted next year by C. C. Eastgate, a representative of the electrical firm.⁶⁰ A sum of Rs. 50,000 was provided to finance the scheme to expand the electrical system in the town. An additional Rs. 25,000 was allotted in the PWD budget for the purpose of erecting a new power house. For the rulers of the state of Cooch Behar, a generous allocation

from the state exchequer demonstrated the importance and urgency of the electrification plan:

To provide funds in accordance with Mr. Eastgate's proposals, an additional sum of Rs. 35,000 was provided in the Revised Budget of the Electrical Department for the year. Out of Rs. 85,000 thus provided in the Electrical Department Budget, Rs. 37,000 was transferred to the Public Works Department Budget for the construction of an Electric Godown, Workshop and office, etc.⁶¹

Another administrative report mentioned the following: "The Cooch Behar, Dinhata, Haldibari and Mathabhanga Town Committees had 139 (Electric 90, Kerosine 49), 42, 43 and 34 street lamps respectively and their maintenance charge amounted to Rs. 4899."⁶² Nipendra Kumar Nag, an electrical engineer trained in America, was appointed in charge of the Electrical Department of the Cooch Behar state. The department in question was responsible for the routine maintenance of the electrical systems. In 1931, work was done on the royal palace's kitchen, stable, and main building's wiring. The Durbar Hall chandelier's earthquake-damaged pieces required expensive replacements that same year.⁶³ During the years 1934–35, electric energy was supplied to the town, including Nilkuthi, without interruption. The total amount of energy generated during the period was 168,985 units, which was larger than in the previous years. The expansion was due to increased consumption at the State Waterworks.⁶⁴ The following year, around 3800 feet of overhead wires were extended in the western portion of Circular Road, Raj Rajendra Narayan Road, Dalton Street, and a lane that connected Temple Street and Debibari Road. The engines had been properly serviced and were operating at peak efficiency. The number of new permanent connections granted was thirty-two, as opposed to nine the year before. The 1934–1935 budgetary allotment for electrification appeared to be:

The original Budget grant for the year was Rs. 42,526, which was subsequently increased to Rs. 45,982 in the Revised Budget. The increased provision was allotted for

⁵⁸ *Annual Administrative Report of the Cooch Behar State for the Year 1899–1900* (Cooch Behar: Cooch Behar State Press, 1900): 35.

In 1906, an engine shed was erected at the palace at a cost of Rs. 9776, and for new wiring and cable there, the expenditure was amounting to Rs. 6409. *Annual Administrative Report of the Cooch Behar State for the Year 1906–1907* (Cooch Behar: Cooch Behar State Press, 1907): 4.

⁵⁹ *Annual Administrative Report of the Cooch Behar State for the Year 1909–1910* (Cooch Behar: Cooch Behar State Press, 1910): 25.

⁶⁰ *Annual Administrative Report of the Cooch Behar State for the Year 1925–1926* (Cooch Behar: Cooch Behar State Press, 1926): 7.

⁶¹ *Annual Administrative Report of the Cooch Behar State for the Year 1926–1927* (Cooch Behar: Cooch Behar State Press, 1927): 4.

⁶² *Annual Administrative Report of the Cooch Behar State for the Year 1928–1929* (Cooch Behar: Cooch Behar State Press, 1929): 19.

⁶³ *Annual Report on the General Administration of the Cooch Behar State for the Year 1931–1932* (Cooch Behar: Cooch Behar State Press, 1932): 50.

⁶⁴ "The waterworks were in operation regularly throughout the year, 20,250,000 gallons of water being supplied, as against 29,150,000 gallons in the previous year." *Annual Report on the General Administration of the Cooch Behar State for the Year 1933–1934* (Cooch Behar: Cooch Behar State Press, 1934): 66.



49 **THE COOCH BEHAR GAZETTE, APRIL 1, 1937. PART I**

APPOINTMENT—The 19th March, 1937.—The following gentlemen are re-appointed as members of the Haldibari Town Committee with effect from the dates as noted against their names :—

1. Sj. Upendra Sankar Sarbadhyaksha ... the 1st February, 1937.
2. Maulvi Dhawajruddin Prodhan ... the 1st April, 1937.
3. Sj. Hazarimal Bagri ... the 1st April, 1937.

CORRIGENDUM.—The 19th March 1937.—In the order issued under date 6th March, 1937, cancelling three days' privilege leave granted to Sriyut N. K. Nag, Electrical Engineer, Cooch Behar, in place of "afternoon" of the 23rd February, 1937, please read "forenoon" of the 23rd February, 1937.

By order,

H. K. SEN GUPTA,
Registrar, State Council, Cooch Behar.

Fig. 2 *The Cooch Behar Gazette* reported on Nipendra Narayan Nag, electrical engineer of the state (1937). Courtesy: North Bengal State Library, Cooch Behar

extension of overhead lines, Electrical installation in the Boarding Superintendent's quarters, and purchase of a typewriter.⁶⁵

A staggering 209,977 units of energy were produced in 1935–1936. This resulted from most consumers—both public and private—consuming more. It was reasonable to assume that the introduction of free supply or provision at a set nominal rate of electric current was the cause of the increase in the case of certain State and Town Committee institutions. There was also a tendency for the State Press, Treasury, Revenue, Debutter, and Malcutchery offices to undergo significant ceiling fan repairs because of leaky roof damage.⁶⁶ 31,903 units of excess energy were generated during 1936–1937 due to larger consumption by all classes of consumers. The increased consumption of about 37% in the royal palace was due to the investiture ceremony of the Maharaja Bhup Bahadur and the celebration of the

marriage of princess Ila Devi. Compared to twenty-four the year before, twenty-six new permanent connections were made. The state of Cooch Behar's industrial sector benefited significantly from electrification. The production of ice brought in consistent revenue: "Though the ice machine had to be stopped for about two weeks for overhaul and repair, 1572 cakes of ice were supplied to the authorized agent compared with 1482 cakes in the previous year. A sum of Rs. 1600 instead of Rs. 1500 in the previous year was received from the agent."⁶⁷ Even the functioning of the waterworks was strengthened with electrification. The average daily consumption of water during the late 1930s was about 112,000 gallons. A water softening plant was installed in 1938 for the improvement of drinking water. The public had much appreciated the improvement in the quality of the drinking water. A rotary centrifugal oil filter was installed in the powerhouse during the same year to prevent the wastage of used lubricating oil.⁶⁸

⁶⁵ *Annual Report on the General Administration of the Cooch Behar State for the Year 1934–1935* (Cooch Behar: Cooch Behar State Press, 1935): 68.

⁶⁶ "Extension of overhead lines by 6300 ft. Was completed during the year in Bangehatra Road, part of Circular Road, part of Smith Road and in Houghton Street up to its junction with Nripendra Narayan Road." *Annual Report on the General Administration of the Cooch Behar State for the Year 1935–1936* (Cooch Behar: Cooch Behar State Press, 1936): 72.

⁶⁷ *Annual Report on the General Administration of the Cooch Behar State for the Year 1936–1937* (Cooch Behar: Cooch Behar State Press, 1937): 89.

⁶⁸ "The sum of Rs. 11,284 was spent to meet the cost of electric installation in the Post Office building, Model Dairy, Office of the Supervisor of State Gardens, Fire Brigade Barrack, and installation of water softening plant in the waterworks." *Annual Report on the General Administration of the Cooch Behar State for the Year 1938–1939* (Cooch Behar: Cooch Behar State Press, 1940): 112–113.



In 1940, Rai K. C. Ganguli, the State Council's acting vice president, took over as head of the Cooch Behar State's electrical department. While the technical part, throughout the period of the study, was managed by Nripendra Kumar Nag. It's interesting to note that the development of electricity aided in the advancement of other modern technologies. Cooch Behar State was also not an exception. According to a report from the administration: "The sum of Rs. 8986 was spent from the budget provision of Rs. 12,483 for rent of telephones and to meet the deficit in the income of the Telegraph Office maintained at Tufangunj sub-divisional Head Quarters."⁶⁹ Here comes the question of technological choice. According to David Edgerton, the assumption that the new is clearly superior to what went before has an important corollary (Edgerton, 2008, p. 9). When choosing one technology, society or an individual resists many old and alternative technologies. Thus, during the mid-twentieth century, the telephone had many takers, compared to telegraphs in the princely state of Cooch Behar—both technologies flourished with the advent of electricity (Fig. 2).

6 Conclusion

The primary purpose of this article is to investigate the links and interactions between electrification, colonial, commercial, and imperial powers, and local conditions in a colonial context. It examines some *technopolitical* aspects of the early years of electrification in British Bengal and princely Cooch Behar. How did in colonial conditions electric systems help demarcate and define regional modes of governance? Historically, the electricity industry in Calcutta started during the 1900s as a profit-making private enterprise and was able to cover its costs through high, unregulated prices. During the early twentieth century, electricity services were not widespread and, to a large extent, were considered a luxury in many regions, especially rural areas. However, this situation changed considerably during the later years of the Raj, and several district towns and *mufassil* areas exhibited interest in getting the benefits of this modern technology. The character and direction of the development of modern technology are greatly influenced by the changing political ecology of a colony in which electrification is embedded. In colonial settings, the introduction of electricity interacted with local responses of the political and business elites, technologists, and the general public to its utility, necessity, and symbolic value vis-à-vis alternative forms of technology.

Although the British Indian Government and the Colonial Office in London played a political and legal role in promoting electrification, they were not entirely in charge of the process's industrial, technological, and economic elements. The technology that had been chosen (thermal rather than hydropower in the case of Bengal), the equipment that had been bought (diesel engines and electrical equipment from Britain or locally purchased), and the knowledge that had to be transferred made the electricity sector a contested terrain. It triggered an intense debate and disagreement among various stakeholders—provincial Government, local municipal bodies, and electric utility companies. Not only was political ideology a major factor in shaping the course of technological development, but powerful individuals and institutions also played a significant role. For example, S.W. Redclift, Electrical Adviser and Chief Electric Inspector of Bengal, was a great promoter of this industry. He even proposed to divide Bengal into five geographical zones to facilitate electrification (1939). Dr. B.N. Dey, Chief Engineer of the Calcutta Municipal Corporation, emphasized the necessity to opt for electricity as opposed to other forms of illumination and subsequent industrialization based on electricity. In addition to the Calcutta Municipal Corporation, several other municipal bodies in Bengal had their own understanding of managing the power industry that frequently ran counter to that of foreign capitalists and imperial rulers.

In methodological terms, this means that studies of electricity consider the expectations and experiences of its diverse promoters and users. This technology had been initially introduced into Indian urban landscapes to expedite a spectacle of modernity. Urbanization concepts began to take on new technological classifications: 'advanced' parts of the town with electric lights, and 'backward' neighbourhoods with kerosene lamps, etc. Even far-flung places from Calcutta followed suit. In this technological deliberation, not only colonial and national interests but different technologies of illumination also played a prominent role. Gas as an alternative form of illumination challenged electricity considerably during the period of study. Because different political and social groupings in colonial India gave electricity distinct social and cultural connotations, it was not just accepted, opposed, or promoted for its technological worth. Examining the political, social, and cultural aspects of electrification reinterprets the common understanding of electricity as something that is provided by the state, patrons, and consumers. Though promoters aimed to pique their subjects' interest by portraying the West, particularly Britain, as a paradigm of technological modernity, the cases discussed in this article show that the language of electrification became heavily influenced by the emergence of diverse political and social elites, their contested ideas of technology, and their desire to think beyond the box of Western thought.

⁶⁹ *Annual Report on the General Administration of the Cooch Behar State for the Year 1939–1940* (Cooch Behar: Cooch Behar State Press, 1941): 122–123.



Can the course of electrification tell a different story while looking to Indian princely states? Between 1850 and 1947, British colonization played a significant role in legitimizing the princely kingdoms. The monarchs, who served as the collaborators of colonialism in Cooch Behar, were legitimizing the practice itself. The development of electricity was absolutely uncontested in the case of Cooch Behar in comparison to colonial India in general and Bengal in particular. Influenced by a sense of technological modernity, which came as colonial baggage, the rulers of Cooch Behar, from Nipendra Narayan (1862–1911) to Jagaddipendra Narayan (1915–1970), were great exponents of urbanization and industrialization backed by electricity. Unlike many contemporary monarchs, who had neither the knowledge nor interest in dealing with technology, they thus left the complex technical matters to the care of British experts. The rulers of Cooch Behar had recruited Nipendra Kumar Nag, an Indian electrical engineer, to manage the Electrical Department of the state. Interestingly, Nag was not educated in England but in the USA. Such tendencies emphasize the importance of international, extra-imperial networks in India's science and technology growth during the mid-twentieth century. Engineers like Nipendra Kumar Nag serve as a significant point of origin for a technological identity defined in relation to the United States.

Acknowledgements The author wishes to acknowledge the Indian National Science Academy, New Delhi, for its generous funding of this research project, for which he is extremely grateful. The author also expresses gratitude to the members of the Indian National Commission for History of Science and Research Council, Indian National Science Academy, for their insightful criticism and support of the theme. Throughout different periods, the author obtained significant insights on the subject from Deepak Kumar, Jagdish N. Sinha, Smritikumar Sarkar, Suranjan Das, Arnab Rai Chaudhuri, Tirthankar Roy, Prakash Kumar, and Projit Bihari Mukharji, among others. The author expresses gratitude to the anonymous referee for their insightful comments. Madhvendra Narayan has, as always, been an excellent editor.

Funding Indian National Science Academy, HS/RC/374, Suvobrata Sarkar.

Data availability Not applicable.

Declarations

Competing interest The author has no competing interests to declare that are relevant to the content of this article.

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