

## Technology and Rural Change in Eastern India, 1830-1980

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'Big' technologies like the railways, the electric telegraph and the steamer seem to attract 'big' narratives of change. Many scholars have described their effects on the fabric of society and on everyday life as 'revolutionary'. The railways, the telegraph and the steamer provided new avenues for the political and socio-economic empowerment of some social groups, while proving detrimental to the development of others. Older modes of life, production and trade were disrupted and transformed as a result of increased mobility of people, goods and ideas, as well as the regional, national and global integration of markets. In vast countries such as the United States, the telegraph and the railways have also been conceptualized as instruments of national cohesion. They helped to efface regional differences and to forge national identity, not only by assisting the conduct of administration and business, but also by mediating the circulation of a growing volume of print matter in the form of books, newspapers, popular and scientific periodicals.

Perhaps unsurprisingly, 'big' technologies have also attracted more attention from scholars than 'smaller' technologies like weaving looms, spinning wheels, rice hullers, bicycles, steel pens or typewriters.<sup>(1)</sup> In part, this is motivated by the important role they played in processes of industrialization and modernization during the 19th century and, by extension, the privileged position they occupied in the public consciousness of the period. For many observers and, later, scholars who subscribed to a Whig model of history as progress, the railways, the telegraph and the steamer were the embodiment of 19th-century ideals of improvement, an undeniable demonstration of human ability to conquer nature and overcome obstacles through the application of reason and science. In former colonial settings like India, technologies such as these acquired additional layers of symbolism and significance, being widely perceived as instruments of civilization and modernization. In the words of a mid-19th century *Leisure Hour* contributor, they were 'great physicians' that could 'resuscitate the inhabitants of India of all creeds and nations from the long deep lethargy which has afflicted them'. In Daniel Headrick's famous and more contemporary formulation, they were 'tools of Empire' which enabled the colonial state to expand and perpetuate itself.<sup>(2)</sup> If tracing the responses of the literate, urban, middle and upper echelons of society to the introduction and use of these technologies has been a relatively straightforward task, identifying the reactions of those who fell outside the remit of these social groups has proved to be more difficult, especially in the colonial context of South Asia.

In his fascinating and well-researched book, Smritikumar Sarkar demonstrates that it is possible to write a

history of technology in South Asia which does not discriminate between 'big' and 'small' technologies, but treats them simultaneously, as interrelated and interacting elements of a coherent whole. He also shows that it is possible to write a history of technology in which the voices of colonial administrators are analyzed alongside those of the farmers and artisans who were directly affected by the construction of the railways or the introduction of a new machine for conch shell slicing. Indeed, one of the strengths of the volume is the diversity of sources on which it draws, as illustrated by the perusal of a wide range of official records available at the National Archives of India as well as local level sources such as folk songs, oral traditions and vernacular literature in Bengali.

The book is a 'social history of technology' and examines how British colonialism facilitated the introduction of new forms of transport and manufacturing technology into the Indian subcontinent and their impact on village society (pp. xi–xii). Despite its relatively narrow focus on Bengal, the study contains numerous references to present-day Orissa, Assam and Bihar (which were incorporated, at various periods of time, into British Bengal) as well as other parts of India such as Bombay, Gujarat, Punjab and Tamil Nadu. While exponents of Western imperialism described rural India as predominantly stagnant and poor ('hungry Bengal'), Sarkar's account aims to demonstrate that this was a vibrant and versatile environment where people did not shy away from the use of new technologies and did not lack in entrepreneurial initiative. His healthy skepticism towards grand narratives of technological change enables him to produce a multifaceted account of the history of technology in rural India, one which shows that the use of new technology was shaped by a complex of factors like geographical location, presence or lack of capital, access to technical education and the ability to tap into indigenous networks of trade and exchange. Furthermore, by focusing on small-scale enterprises and 'their role ... [in] initiating many a new way of manufacture in India that in the long run proved very successful', Sarkar urges us to revise our definitions of entrepreneurship and to reconsider 'the role of the state as a factor in motivating the entrepreneur' (pp. 10–12).

The book is organized thematically into five chapters. The first chapter, 'From bullock cart to the railways: exploring the interior', charts the transition from older modes of transport by bullock carts and boats, which facilitated the movement of people, especially pilgrims, and goods along Bengal's roads and rivers, to newer technologies like the steamboat and the railway. As Sarkar points out, the construction of a new system of transport ended the relative 'isolation of the village' (p. xiii). The railways, in particular, offered a new way of locomotion characterized by increased speed and regularity and greater freight capacity (p. 63). The process of railway construction proved to be disruptive to the human ecology of Bengal, especially since it involved the acquisition of land on a considerable scale. In the first stage of construction, which extended roughly until the Indian Mutiny of 1857, compensation was based on a uniform rate that ignored the location-specific value of land. There was also a deliberate effort to avoid the dislocation of more affluent sections of the community at the expense of the cultivating class. This policy changed in the aftermath of 1857, when the rates of compensation were not only increased, but also became location-specific. Predictably, one of the outcomes of railway construction, with its accompanying land acquisition drive, was a surge in the price of land.

The second chapter, 'New tools in old hands: artisan as barefoot entrepreneur', urges us to reconsider the distinction between tools and machines and argues that the overemphasis on the latter since the 19th century has obliterated the importance of Bengal's artisans as entrepreneurs. The chapter examines the three major artisan groups of eastern Bengal, weavers, braziers and blacksmiths, and critiques the notion that tool techniques remained relatively unchanged prior to the introduction of more 'modern' raw materials and machinery like cotton mills, imported metal sheets and conch shell slicing machines. Bengal had been one of the major producers of cotton textiles and silk goods in India since Mughal times; some of these products were traded as far as Malacca, Coromandel and Ceylon. The European impact was felt in the field of technology, where the introduction of cotton mills affected the local system of supply in which the interaction between weavers and merchants was mediated through small-trade intermediaries. But the effects were also visible in the drive to standardize the quality and price of cloth, with local buyers no longer able to negotiate the price upon direct inspection of the product.

In the following chapter, 'Machines in the periphery: rice, sugar and oil mills', the discussion turns to another sector which was transformed by the introduction of new technology during the 19th and 20th centuries, namely the production and processing of rice, sugar and oil. Of particular interest here is the debate surrounding the introduction of rice milling technology in Bengal which took place at a later period than in Burma and Madras. This has sometimes been attributed to cultural prejudices against the rice mill, but Sarkar convincingly demonstrates that the successful use of rice milling technology depended to a great extent on the location of the mills and the nature of the enterprise. Export-oriented mills such as those of Burma and Madras were more likely to succeed than mills which catered predominantly to local demand. However, the relevance of local taste and practice is not completely discarded, with Sarkar pointing out that rice mills could only produce non-boiled rice of an inferior quality to the parboiled rice usually consumed in the eastern part of India.

In chapter four, 'Technology beckons: *Bhadralok* enterprise in the suburbs', the author expands on a less examined aspect of the history of the Bengali urban elite during the colonial period, namely their entrepreneurial activities and 'concern for the rural poor' (p. 179). Popular figures such as Bankimchandra Chattopadhyay, Rabindranath Tagore, R. C. Dutt, Akshoykumar Datta and Kishorichand Mitra embraced to various degrees the *bhadralok* vision of industrialization as a 'panacea for Bengal's ills', but questioned its impact on village society. Many of them were entrepreneurs themselves and advocated small-scale enterprises as a more appropriate business model in a country where the majority of the population was unskilled, lacked capital to invest and was hindered by the unfavourable fiscal policies of the British Raj. Bengal's connections with Japan are particularly visible here, as entrepreneurs sometimes travelled to Japan to acquire expertise and familiarize themselves with new technologies and manufacturing processes, for example in the field of match manufacture and hosiery. Another important point which deserves emphasis is the fact that the successful marketing of goods, especially of low-priced bulk goods such as matches, depended on the entrepreneur's ability to tap into extant networks of trade and transport (p. 191). Among the marketing strategies employed by hosiery companies such as Tagore's, Surendranath Banerjee's and Motilal Gosh's Shilpa Sanjibani was the use of salesmen who popularized products with the help of folk songs and caricatures (p. 197). Since the discussion of marketing represents an important aspect of the analysis of *bhadralok* enterprise and many entrepreneurs were also connected to the newspaper press, it would have been interesting to learn more about the role of newspaper advertising in promoting the consumption of such small goods.

Chapter five, 'The power of steam: breakdown of the old economy', weaves together the discussion in the previous chapters by considering, from a holistic perspective, the ways in which steam, in its various incarnations, transformed the economy of rural Bengal. The advent of the railways shifted attention from the riverside as a locus of trade and social interaction to the train station. Local responses to these changes were diverse: while some regarded the railways as vectors of infectious diseases, others embraced the new opportunities for mobility and trading they provided. This was the case with villages that did not have easy access to the system of trade via the Hooghly River on account of their unfavourable geographic location. The railways also transformed rice trade, putting an end to its dependence on seasonality, while the building of railways, bridges and viaducts offered opportunities for employment for labourers from Bihar, Orissa, Andhra, Madras and the United Provinces.

If the bulk of the book is focused more on the socio-economic impact of new technologies, the conclusion considers some of the cultural aspects of this change. These transformations ranged from the emergence of the train station as a 'nucleus' of social gathering and commerce which attracted not only vendors, but also blacksmiths and carpenters in search of a broader clientele base. It wasn't only the well-to-do who took to railway travelling with gusto: the railways also increased the potential for mobility of many villagers who were in search of seasonal labour. As Sarkar puts it, 'village society [was] at a crossroads'. The growing interaction with the urban environment of Calcutta spurred a transformation in architecture, clothing and eating habits, reflected in an increased appetite for tea and biscuits and the emergence of petticoats, blouses and colorful sarees as common attire for many young women by the mid-20th century. Increased mobility

also affected the role of women in the rural environment. This was particularly conspicuous among artisan groups like the weavers of Darbhanga, whose womenfolk were forced to look for work outside their homes after the introduction of the rice mill (p. 302).

Among all the technologies that came to India with British colonialism, the railways have perhaps received most attention from scholars, some of whom have also documented folk receptions of this new technology.

(3) But Sarkar's contribution consists in his ability to connect the story of this major technology with the myriad ways in which it interacted with other technologies and the lives of artisanal and peasant groups in the rural environment of eastern India. In light of Sarkar's extensive work with India's artisans, especially tribal blacksmiths such as the Agaria and the Asur, one feels that the book would have benefited from a more substantial engagement with the theory and methodology of oral history and especially from a greater emphasis on the interview data collected. While there are occasional references to interviews in the footnote sections, the voices of the artisans themselves are unfortunately less visible in the main text. Another minor drawback is the absence of a map of Bengal. This would have greatly assisted reading, since the discussion is peppered with references to localities in rural Bengal, some of which might be less familiar even to the South Asia specialist, let alone to non-specialists. Overall, however, this is a valuable book which has much to offer to anyone with an interest in the history of science and technology and the social and economic history of South Asia. Histories of technology can be notoriously dense and difficult to read, yet Sarkar has been successful in producing an engaging and readable account which deserves a place in the syllabus of any course on the history of science and technology in South Asia.

## Notes

1. For South Asia, one notable exception is David Arnold's *Everyday Technology: Machines and the Making of India's Modernity* (Chicago, IL, 2013).[Back to \(1\)](#)
2. Anonymous, 'The three great Indian physicians; or, railways, canals and telegraphs', *Leisure Hour*, 19 October 1854, pp. 663–6; Daniel R. Headrick, *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century* (New York, NY, 1981).[Back to \(2\)](#)
3. See, for example, *Railways in Modern India*, ed. Ian J. Kerr (New Delhi, 2001).[Back to \(3\)](#)

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