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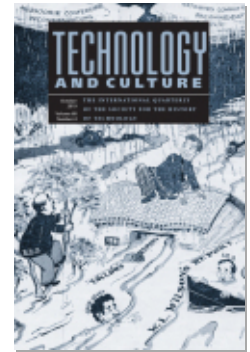
Introduction

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Technology and Culture, Volume 60, Number 4, October 2019, pp. 933-952
(Article)

Published by Johns Hopkins University Press

DOI: <https://doi.org/10.1353/tech.2019.0096>



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SPECIAL ISSUE: NEW HISTORIES OF
TECHNOLOGY IN SOUTH ASIA

Introduction

PRAKASH KUMAR

The history of technology of South Asia should justifiably reflect the particularities of South Asian colonial pasts and the trends that became palpable at its postcolonial moment. In what historically specific ways has coloniality intersected with technology in South Asia? The particular questions of colonial power and exclusions, the autonomy of the subaltern voice, and the imagined futures as India at independence grappled with a new socio-economic order in the midst of colonial legacies call upon historians to make purposeful selection of archives and to deploy specific methods. These choices should determine the nature of South Asian technological history. In other words, a technological history of South Asia cannot simply be a history of technology “in South Asia,” a one-sided imposition of historiography of technology on a new geographical site.¹ The contributors to this volume agree that South Asia should not be treated simply as an empirical site to which the already existing analytics and methodologies of the broader field of history of technology can be “extended.” Our implicit claim in writing these technological stories is that South Asia should be (and it already is) also a location to unravel new analytics and methods. The contributors thus aim to demonstrate how looking at the history of technology from South Asia changes what it means to do history of technology.

Calling the approach followed by the contributors to this volume post-Marxist and post-nationalist would be eminently inadequate, if a safe label. Just as much as they are distanced from older Marxist and nationalist

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0040-165X/19/6004-0001/933-52

1. Such questions were discussed in the context of STS for East Asia in *East Asian Science, Technology and Society: An International Journal*, and formed the kernel of articles in the journal's inaugural issue of 2007.

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approaches, the contributors are also heirs to standard critiques of modernity within a certain mode of analysis in South Asia. Readers will find in these articles a direct engagement with the question of the modern and the place of technology in the construction of the modern. Political modernity and its various institutions, Dipesh Chakrabarty told us, “all bear the burden of European thought and history.”² In a sign that such questioning of modernity’s universal claims have become mainstream, all South Asianists proceed with the assumption that the metanarrative of modernity may after all be inadequate to assess all of the lived experiences in South Asia. This reflexivity to “modern” defines all of the contributors’ technological histories, and perhaps sets them apart. While questioning modernity is a staple in the historiography of technology, the contributors in this volume will critique modernity from a position firmly within South Asian scholarly conventions.

Approach and Themes

The articles in this volume display a distinctive crossdisciplinarity that is not out of sync with trends in the field of South Asia, and reflects the way the field has evolved and honed its disciplinary practices over the years. A distinct porosity of the discipline of history in South Asia can be traced to its earliest incarnations. The 1960s works of Bernard Cohn, a pioneer in the field, are instructive. Cohn’s work is distinctive, among other things, for exploring conjointly the methods, practices, and theories of two disciplines, what Cohn referred to as “Anthropologyland” and “Historyland.” Later, writing a foreword in an omnibus to Cohn’s work, Dipesh Chakrabarty celebrated the ease with which Cohn was known to navigate the disciplines of history and anthropology and to call them both “home.”³ The 1960s trend was further consolidated with the emergence of the subaltern studies in the 1980s that emerged as a critique of historicism across several disciplines. The active crossdisciplinarity of the subaltern and postcolonial arms of South Asian historiography accelerated the field’s spread into disciplines of social sciences and invited the involvement of postcolonial theorists from multiple disciplines.⁴ The same crossdisciplinarity marks the

2. Dipesh Chakrabarty, *Provincializing Europe*, 4. Because the widely prevalent theories of the modern are encumbered by the framework of Western intellectual thought, Dipesh Chakrabarty has argued, the task of studying Indian history must essentially be a project in “provincializing Europe.” So, writing for technology and modernity in a South Asian tradition is to partake simultaneously in the task of decolonizing ways of knowing the past.

3. Bernard Cohn authored an article in the 1950s that lent its name to a later book in the 1980s. *Bernard Cohn, An Anthropologist Among the Historians and Other Essays*; Dipesh Chakrabarty, “Bernard Cohn,” ix.

4. Dipesh Chakrabarty, “Subaltern Studies and Postcolonial Historiography,” 23. See also: Manu Goswami, “Partha Chatterjee Interviewed.” “To hunt and gather in the

approaches in South Asian technological history broadly, which have come to incorporate the practice of radical social history, a new political economy, historical and cultural anthropology, ethno-history, and literary and textual analysis.

Historians of technology in South Asia marshal this crossdisciplinarity to address a number of questions that can be seen as central to the historiography of technology. To review every pertinent question would be a herculean task even for a start. But in trying to keep the review of this literature manageable, one can tease out the three central themes that are pertinent to the historiographies of technology and South Asia. One of those is the subject of colonial improvement schemes and their relationship to the modernity of distinct classes. A second would be the theme of “development,” another subject that seems to be of crossover interest and is especially pertinent in studies of the postcolonial project of nationalism and of newly defined institutional practices in India after independence in 1947. A third important theme, related to the much-studied subject of the neoliberal order, is that of the “global turn.” The five articles in this issue delve into a range of key questions connected with these primary themes—modernity and classes, development and power, and globality. They also take the opportunity to showcase the particular way historians of India have handled these questions.

The articles by Prasad and Mukharji specifically showcase the stance of reflexivity to the “modern” taken up by South Asianists on methodological and epistemological grounds. Although all pieces address this, Prasad’s and Mukharji’s in particular point toward the unhelpfulness of archives or the strength of modernist discourses that keep alternate experiences out of view. Amit Prasad’s article on the history of magnetic resonance imaging (MRI) in this volume illustrates how the technologies and experimental set up of nuclear magnetic resonance (NMR), which could legitimately be read as constitutive of the history of later MRI, finds no recorded history of itself in conventional archives. Prasad is here looking at erasures where only “Europe” can act as a legitimate sluice for technoscientific practices and is recognized as such, even in the minds of prominent Indian scientists who have a deep knowledge of the field and its practices. Prasad sees this phenomenon of erasure as partly historiographic, indicating that the understanding of “west” as the fountainhead of all cutting-edge knowledge is discursively insinuated and that historiography plays the role of an accomplice in such a consolidation.

The importance of this insight cannot be overstated. It reminds us that a critical awareness of Eurocentrism in our analysis does not portend the

forests” is the expression Chatterjee uses to describe this initial effort to re-launch questions raised in Indian sociology and anthropology in political and social history of India. Goswami, “Partha Chatterjee Interviewed,” 179. A similar assertion can be found in Aditya Nigam, “Partha Chatterjee Interviewed.”

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end of Eurocentrism. This provides grounds for our continuing effort to decolonize knowledge, including the frames within which “modernity” has come to be interpreted. Projit Mukharji’s article points to the astonishing phenomenon, showing how the use of the modern stethoscope as a new therapeutic technology in ayurvedic medicine has evidently been mentioned in ethnographic accounts, yet the conventional archives remain silent about their existence. Mukharji thus invites historians to examine the “traces” of such innovation and to historicize the significance of such absences. To overcome the limitations of archives and historicism, Prasad takes up deconstructive methods from historical sociology whereas Mukharji turns to canonical, vernacular sources to bring “traces” that might otherwise go amiss back in to mainstream history. Bharat Venkat’s article in this volume falls back on examining contemporary evidence through ethnographical work in present-day Chennai (Madras) to pry open the clinical and epidemiological reasoning behind the historical forms of sanatorium in colonial India. Venkat’s methodological strategy is yet another example of the paths South Asianists must embark upon to override the limitations imposed by archives. In this case, the extrapolated evidence allows Venkat to examine the mutual configuration of illness, vitality, and environment epitomized by the colonial sanatorium as a therapeutic technology.

The developmentalist discourse and its global course, and their combined salience for the constitution of classes and identities in South Asia, are two other areas of emphasis in the literature. The historiography also divides itself between two somewhat different approaches that extrapolate classes in a social and political history paradigm or in discursive analysis and analysis of representations. The former arises out of a long trajectory that bears the influence of radical Anglo social history. The latter has a clear debt to postcolonial approaches.⁵ These flag-posting methodological distinctions aside, South Asianist technological history requires a theoretically cultivated aptitude to ask if the colonial subject or the citizen was/is in sovereign charge of her or his life. This basic concern lies behind exploring whether “improvement” or “development” is best construed as a project simply delivered to the mass of subjects or whether the latter ought to be understood as willing participants in these projects. What unites the two trajectories is their common focus on analyzing the “exclusions” that techno-modernity fosters.

Analyzing development schemes through the lens of class is an important agenda for the contributors. Kumar’s article assesses the strength of

5. That said, these distinctions may turn out to be perfunctory except in historiographical pitches. There is a broad consensus in South Asia to accept the value of fundamental subaltern critique while also signaling the acceptance of advantages that accrue in a social history analysis of the undifferentiated colonial and postcolonial “Other” through study of representations in postcolonial writings. See this summation in Prasantan Parthasarathi, “The State of Indian Social History,” 47.

discourses of development in India by finding what they hide and whom they exclude while connecting narratives of development with popular politics. If “development” entailed establishing dominance and excluding specific sectors of society, over whom and how was the dominance established? Which classes were kept out? Even if we cannot document every aspect of the subaltern’s perspective as subjects of development, can we speculate how a subaltern would have responded to discourses of development? Kumar uses ruptures in elite narratives of development to access popular perceptions of development. Rachel Berger also examines the early developmentalist trends in the colony that were aided both by the biopolitical reach of the state, and market forces in which ghee, or purified butter, changed forms. Zeroing in on ghee as “a technology undergoing a transition,” Berger offers insight into how classes are constituted through their alignment and exclusion from specific forms of techno-modernity, while flagging the interruption introduced by ghee’s mimetic other, a substitute—the *vanaspati ghee*.

The treatment of South Asian history of technology in a global perspective involves looking for connections that may be deprioritized in the overbearing focus on the local in area studies approaches. These connections are random by nature, going beyond well-known formations of recognizable regions such as South Asia or a well-known metropolis-colony axis. Indeed, the randomness of these connections provides a fresh approach to analysis. The Allahabad Agricultural Institute in Kumar’s paper, for instance, was more closely connected to agrarian ideals in the United States than to, say, any of the colonial and national agricultural centers on the subcontinent. There is no assumption in these works of a topographically flat globe where technology circulates freely and without “friction.” Specific actors and/or structures and discursive contexts stand behind and make certain mobilities possible. The *vanaspati* that introduced a major interruption in the biomoral world of ghee in colonial India was actually produced at a factory in the Netherlands run by the Van den Bergh family, the owners of a Dutch conglomerate with ties to South Africa and the British East African Empire. Discrepant linkages of this sort—an extra-imperial entity making its entry into the British imperium, as in this case—could introduce novelties, disruptions, and changes that were out of the ordinary for the regular rhythms of the colony. In similar modes, South Asianists have never lost sight of issues of power and access while dealing with larger transregional imaginaries more generally. They have also noted the historical production of a sense of locality (e.g. the nation) precisely at the moment that there is a historical production of some larger imaginary.⁶

6. Asif Siddiqi, “Science, Geography, and Nation.”

Linking Techno-Modernity to Classes and Identities

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The distinct trajectory of analysis across these essays consciously links the relationship of techno-modernity to diverse social classes. In an important 1990 article, Gyan Prakash raised the question: how should the third world write its own history?⁷ Prakash's call was for a genuine "endorsement of heterogeneity" that would allow a search for identities in relational terms, rather than through essentialist invocations of, say, class or nation. This openness to contingent historical identities was taken up within the Subaltern Collective.⁸ Recovering the identity of the subaltern in a systematic way may have been the preserve of subaltern historians. But across the board, all historians of South Asia have used a range of strategies to recover multifarious "subjects" and their worldviews in non-derivative ways. Historians have variously addressed histories of subordinate classes, for example in studies of Dalits and Adivasis, the poor, "tribals," or "insurgents."⁹ This trend shows the mainstreaming of the specific concern raised by post-colonial scholars for recognizing multiple subject positions.¹⁰

Following the trends in social historical and discursive analysis, all of the authors in this volume can be placed somewhere on the trajectory of a deliberate journey away from the Marxist view of "class," with its attendant economic determinism, and that of "nation." Who or what counts as "India" or "Indian" (as stand-ins for "non-Western") and who is left out of the ambit of techno-modernity—except, at best, as objects of a grand plan to improve well-being or objects of knowledge creation—is a fundamental concern in each of these articles. Prasad's piece on MRI addresses this problematic head-on while recovering the contributions and networks of "Indian" scientists in India's own MRI history. Mukharji insists on calling modern Ayurveda in India a "braided" science to emphasize the need to

7. Gyan Prakash, "Writing Post-Orientalist Histories of the Third World."

8. *Subaltern Studies, Vol. I – X*. Prakash was summing up the position at which the subaltern scholars had arrived on the basis of work done by several scholars in the Subaltern Collective project since the early eighties, and reflected the scholarship's reasoned position then. For a skeptical approach to endorsement of "identity," see Frederick Cooper, *Colonialism in Question*, 59–90. South Asianists too have criticized the overly representational orientation of the later subaltern school. Sumit Sarkar, *Writing Social History*.

9. For Dalits see, for example, the works of Gail Omvedt. Omvedt, *Cultural Revolt in a Cultural Society*; Omvedt, *Dalits and the Democratic Revolution*; and Omvedt, *Seeking Begumpura*. For Adivasis, see *Indian Economic and Social History Review* 53, no. 1 (2016), including Sangeeta Dasgupta, "Introduction," 1–8; Daniel J. Rycroft and Sangeeta Dasgupta, *The Politics of Belonging in India*; and Uday Chandra, "Towards an Adivasi Studies." See also Indrajit Roy, *Politics of the Poor*; Amita Baviskar, *In the Belly of the River*; and Alpa Shah, *In the Shadows of the State*.

10. The word "subaltern" has currency in all South Asian histories, social sciences, and even Latin American and African histories. There is a clear admission that contemporary political and social conditions in India at least make a consideration of the subaltern pertinent.

get beyond the dichotomous parentage implicit in the phrase “hybrid knowledge” and illuminate the fact that all traditions of knowledge, whether Western or non-Western, are always constituted of multiple strands, and it is by braiding them that modern science emerges. These analyses intersect with well-known histories of diffusion and transfer in the historiography of science and technology.¹¹ In this and other instances, the collective calls for a closer look at specific technologies and their alignment with classes and identities.

Pushing back against the trend of asking questions about modernity and its impact, often an unstated assumption in histories of artifacts, the more pertinent question for the authors in this volume is “modernity for whom?” The latter query is posed, self-consciously, from the perspective of modernity’s intended subjects. This approach is just as invested in learning what happened in the past as it is in explaining the present on the Indian subcontinent, wherein many are left behind or remain apathetic to schemes of improvement. This urge for subjectivist insight leads to the question: Do the poor (economic category) or those socially and culturally disadvantaged in South Asia, who constitute the majority of population, have their own universalistic ideas of dignity and justice? How do we recover them historically? How do such imaginaries of positive change intersect with ideas of progress emanating from the state and progressive elites?

The effort to illustrate the elite character of modernity is taken up most directly in the contributions of Berger and Kumar. The colonial state raised the banner of modernity for its various projects and consequently has been the subject of much critical analysis. With much theoretical verve, scholars of South Asia have studied the social life of “improvement” as implicit in many colonial programs in India.¹² South Asianists have focused on the colonial trope of “improvement” to study the colonial society or the colonial state’s specific measures that were carried out in the name of modernity. Within a colonial context, the “nationalists,” situated at the vanguard of the freedom movement, were also often favorably disposed to these projects. So were the prosperous landlords, or “reformers,” each with their own vision for the modern nation and society. A new body of scholarship starting in the 1990s extended this frame of “improvement” to assess the nature of institutions of science and medicine set up by the colonial state,

11. One important contribution that consciously tries to go beyond the familiar paradigm of European “core” and colonial “periphery,” is Kapil Raj, *Relocating Modern Science*; see also Raj, “Beyond Postcolonialism.” Others have complicated questions of “core” further by pointing to the existence of several centers, including those within South Asia. See Itty Abraham, “Landscape and Postcolonial Science.”

12. See reference to James Mills’ utilitarianism philosophical framework and its connections to “improvement” in Asa Briggs, *The Age of Improvement*; Eric Stokes, a dominant voice in the study of colonial agrarian India, pursued these investigations in his study of imperial ideologies and measures. Stokes, *The English Utilitarians and India*.

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efforts toward disease control, and the establishment of infrastructural projects. This was a moment of major conceptual advancement in terms of the ready acknowledgement that scientific and technological projects were never too far from operation of colonial power. This turn was undeniably the consequence of a clear and forceful articulation of the connections between colonial power and “knowledge.” The work completed by an earlier generation of scholars on “colonial knowledge” and rising subaltern critiques were seeping into analysis of expert knowledge.¹³

The analysis of colonial science and technology as anthropological knowledge is not the only way South Asianists have treated technological history in South Asia. The content of science, scientific disciplines, scientific education, and the place of experts in the colonial context have also been analyzed as part of the study of colonial relations.¹⁴ This scholarship looked at institutions and analyzed the correlation between colonial motives and indigenous response. And because the appeal of modern science and technology to separate groups of people was not assumed a priori, scholars painstakingly explored different groups’ diverse entanglements with technological modernity. Sometimes directly, and at other times by allusion, the articles in this special issue will gesture toward the distance of specific classes from modernity, instead of assuming modernity’s unproblematic, positive impact on all. At other points, the elite, exclusionary path of technological modernity will be highlighted in the process of clarifying technology’s relationship to hierarchies in colonial and postcolonial India.¹⁵

One important contribution of postcolonial scholars specifically, which is potentially useful to historians of technology, is the way they highlight the indifference of many subordinated classes to technological modernity.¹⁶ Granted, these classes are dominated, but are the dominated at least allowed the right to agentic control of their lives and the meanings

13. Bernard Cohn, *Colonialism and its Forms of Knowledge*. This book was in fact a later palimpsest in the evolving work of Cohn on the subject of colonial knowledge, a lot of which he had published in the previous decade. See also David Arnold, *Colonizing the Body*; Gyan Prakash, *Another Reason*.

14. See Christopher Bayly’s treatment of astronomers and physicians in Bayly, *Empire and Information*, 247–83; a much more comprehensive treatment in Deepak Kumar, *Science and the Raj*; and in Pratik Chakrabarti, *Western Science in Modern India*.

15. See Anand Pandian’s focus on “virtues of cultivation” for writing a history of agricultural change among the kallar community in Tamilnadu in the colonial and post-colonial eras. Pandian does not engage with colonial or postcolonial discourses of improvement or development, but rather cultural conceptions of virtue, self-governance, and community life among the kallars to pinpoint elements of positive change. Pandian, *Crooked Stalks*.

16. See an excellent reference to questions around the indifference of subalterns to techno-modernity in a recent interview with Warwick Anderson. Amit Prasad, “Things Do Look Different from Here.”

they ascribe to technology?¹⁷ If yes, then how best do we recover those meanings? This concern has catalyzed a turn in South Asia to investigation of the “meaning” of technology to subordinate classes, something that survives in cultural tracts or sources that often tend to be repositories of marginalized visions. Such response may be expressed only in fleeting instances, or in the form of indirect resistance. In pursuing such voices, scholars have consciously uncovered subsumed voices that elite programs of colonial and nationalist modernity sidelined.¹⁸

The effort to highlight the salience of subordinated classes in South Asia has led to another outcome in the guise of a renewed focus on “small technologies.” Historians of technology working on South Asia have consciously turned their attention to technological goods that might be of interest to “individuals outside the privileged ranks of the European and Indian elite,” or everyday technologies. Historians of medical technologies have made notable advances in terms of engaging non-elite therapeutic tradition by studying what stands for “Indian” in medical traditions in a historical context, and exploring technological and therapeutic traditions that are subsumed or displaced in the study of the modern.¹⁹

Development: Technology and Power

Political theorists have made a leading contribution to the study of technocratic development with a particular emphasis on aspects of citizen “participation” vis-à-vis the operation of statist power. They have addressed this problematic through a variety of approaches that imply that expert discourses or statist initiatives for development were remarkable in their ability to “render technical” political and social questions of inequality, access to resources, and justice. In other words, they argue that the drive to development dodges very real political questions, and that the obvious solution requires difficult political choices to change the status quo in society and a

17. This turn in South Asian scholarship marks a rupture from Marxian conceptions of total class dominance, and a turn toward Gramscian understandings of class. To Gramsci goes the credit for coining the term “subaltern,” and drawing from him, subaltern scholars have characterized the status of the subordinated classes within the paradigm of “dominance without hegemony.” See the emphasis on “peasant consciousness” in a context of colonial dominance in Ranajit Guha, in the earliest of subaltern scholarship. Guha, *Elementary Aspects of Peasant Insurgency*; and Guha, *Dominance without Hegemony*. See a concise reference to Gramsci’s relevance to subaltern scholarship summarized in Aditya Nigam, “Partha Chatterjee.”

18. Gyan Prakash sees the Indian engagement with colonial science in differential terms. See his explanation of middle classes’ development of “second sight” and the subalterns’ engagement through rumor, magic, and superstition with colonial projects of improvement. Prakash, *Another Reason*, passim. and 34–45.

19. David Arnold, *Everyday Technology*, 12. Arnold calls his work a “partial response” to the call to turn attention to subsumed identities. See also David Hardiman and Projit Mukharji, *Medical Marginality in South Asia*.

real process of resource redistribution. Partha Chatterjee proposed that the entire set of planning for development in India was in effect an exercise in state policy and a modality in state formation.²⁰ Chatterjee implied that the discourse of development makes invisible the politics that undergird it, or, in other words, “depoliticizes” development.²¹

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In parallel, South Asianists have also drawn on Michel Foucault to study the exercise of biopower over populations. Historians of technology in South Asia are now more open to conceptualizing power as dislocated from its exclusive abode in the state apparatus. This is a notion that is conceptually distinct from the prior understandings of an instrumentalist deployment of technological power in colonial India.²² Historians now see power as diffused and decentered, residing in the interstices of “sovereignty-discipline-government triangle,” as Gyan Prakash explains, in his commentary on the state’s response to occurrence of epidemics and famines in colonial India. Prakash’s use of the notion of “technic” to refer to the perfectly alloyed attributes of science and sovereignty, and of science and technologies of government, is an example of the use of Foucauldian concepts in South Asian scholarship.²³ The control of the colonial body, colonized self, and mind has taken a lion’s share of scholarly attention in such studies of colonial epistemologies and the intersections between science and reason on one hand and the expansive power of state on the other hand.²⁴

Much recent scholarship has moved the fulcrum of analysis away from the state and toward the subjective position of the targets of development. In many of these studies in South Asia, technology is not at the front and center of analysis, but always lurks in the background. In Partha Chatterjee’s study of “political society” in postcolonial India, for example, technology is relevant both in characterizing the particular type of global capitalism he is addressing, and in framing the demand for resources by the

20. Partha Chatterjee, *The Nation and its Fragments*, 200–19. Timothy Mitchell similarly critiqued the expert discourses in Egypt, where United States Agency for International Development (or USAID) technical personnel were engaged in development projects. Timothy Mitchell, *Rule of Experts*. In a slightly different context, Jahnvi Phalkey discusses the role of Indian nuclear physics for building a nation in Phalkey, *Atomic State*.

21. For depoliticization, see Kalyan Sanyal, *Rethinking Capitalist Development*; Partha Chatterjee, trans., “Rethinking Postcolonial Capitalist Development,” 105–6; for “depoliticization” in the African context, see James Ferguson, *The Anti-Politics Machine*.

22. The most representative example of this genre is Daniel Headrick’s early characterization of technology as a tool of empire-building. Headrick, *The Tools of Empire*.

23. Prakash, *Another Reason*, 187–98.

24. Theoretical borrowings have extended from Michel Foucault and Martin Heidegger to Frantz Fanon. For appropriation of Fanon, see Ashis Nandy, *The Intimate Enemy*. There is a significant critique of extreme versions of this line by Sugata Bose, when he asks “why science, reason and development should be culpable for the crimes of modern state.” Bose, “Instruments and Idioms,” 58. On colonial bodies, also see Joseph Alter, *Yoga in Modern India*; Lawrence Cohen, *No Aging in India*.

urban poor. Chatterjee calls for recalibrating our methodological tools to study new elements of subaltern life in India under the condition of electoral democracy. This new subaltern (peasantry, petty producers, and artisans in the informal sector) demands and receives from government agencies a wealth of welfare services including food, agricultural technology, transport, health services, water, electricity, resources for education, and emergency relief. Here the call seems to be for embedding the subalterns' demand for technological resources into a study of broader demand by these subalterns for resources from the state.²⁵

The examination of popular politics in histories of development has come to rely on ethnography. Ethnography often provides an additional means of recovery to the method of working with written records in colonial archives. Many recent political tracts that deal with caste politics in India in the 1980s and '90s clarify the search for "dignity" by those who comprise the category of Dalits, and other deprived classes. This approach also seeks the separation of political, social, and economic modernity for analytical work. Thus, in a study of lower caste politics in three specific states in India, Jeffrey Witsoe argues that what mattered most to the socially and culturally marginalized groups was their desire to have a voice in the daily run of things. The politics of the "backward castes" (as enumerated by the state) was directed at assuming control of the state's apparatus through electoral mechanisms.²⁶ Indrajit Roy develops another facet of poor peoples' politics through his argument that marginal sections created a "political space" in which they negotiated with entrenched classes. His study focuses on popular encounters with improvement schemes and development discourses. Quite clearly, he breaks ranks with those who argue that poorer groups are invariably opposed to state-initiated improvement programs, arguing that such an extreme perspective "holds little water" when examined against empirical evidence of the aspirations of the laboring classes.²⁷

Amartya Sen enriched studies of development in India by drawing attention to the "substantive freedom" of classes for whom development is sought, arguing that the ideal type of development involves making free-

25. See Chatterjee's conception of "political society" for framing the demand by subordinate classes for resources from the state. Partha Chatterjee, *The Politics of the Governed*; Chatterjee, "Democracy and Economic Transformation in India"; Chatterjee, *Lineages of Political Society*.

26. Jeffrey Witsoe, *Democracy Against Development*.

27. Roy, *Politics of the Poor*, quote p. 336; see *ibid.*, 292–345, on popular encounters with state's project of electrification, based on ethnographic research. Amita Baviskar similarly endorses an approach to consider "entanglements" between state-initiated improvement projects and peoples' responses. Baviskar, *In the Belly of the River*. Roy takes a position against James Fergusson's argument that development necessarily "depoliticizes," arguing instead that development leads to an active politicization involving the laboring classes. Roy, *Politics of the Poor*, 337–38.

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dom both the end and the means of developmental programs. Sen's long-standing work on the nature of "freedom"—which he characterizes as comprising political freedom, economic facilities, social opportunities, guarantees of transparency, and protective security—has disrupted a widely held consensus on the nature of development and best practices for implementing development programs. It does so in two specific ways. One, his "capability approach" assigns a responsibility on to both state and society at large to take steps towards strengthening and safeguarding human capabilities. Two, he equates development with the freedom "to choose a life one has reason to value."²⁸ Sen's formulation of freedom invites an ameliorative turn in South Asia for reframing development more broadly as an economic *and* social experience.

The Global Turn

The "global" became relevant in the study of history of South Asia generally almost concurrently with the global turn in the humanities elsewhere. The new openness to examining the global context appears in the awareness of "connected histories," and in the deliberate challenge that fields like Indian Ocean studies have posed to existing geographic or area studies divisions in academia.²⁹ Others have started looking for the sub-continent's trans-border connections, and still others have offered critiques of "global capital."³⁰ In South Asianist treatments, the global as an imaginary or construct is seen to contain multiple axes of "center" and "periphery."³¹ There is widespread acknowledgement that there were "investments made in disconnected histories." Consequently, a critical methodology lies at the heart of the project to recuperate the history of global flows, active boundary-making, and agency and submission in a connected framework.³²

The globalists among South Asia's historians of technology, in parallel, have made a deliberate choice not to limit the study of technology to local

28. Amartya Sen, "Well-Being, Agency and Freedom"; Sen, "Capability and Well-Being"; Sen, *Development As Freedom*.

29. Sanjay Subrahmanyam, "Connected Histories"; Subrahmanyam, *Explorations in Connected History*; Upinder Singh and Parul Pandya Dhar, eds., *Asian Encounters*; Donald R. Davis, "Three Principles for an Asian Humanities"; Sugata Bose, *A Hundred Horizons*; Pedro Machado, *Ocean of Trade*; Johan Mathew, *Margins of the Market*.

30. Indrani Chatterjee, *Forgotten Friends*; Vinay Gidwani, *Capital Interrupted*.

31. These problematics of multiple centers and peripheries are potentially very useful in exploring questions of technology flows.

32. In her study of colonial constructions of Assam's identity, Indrani Chatterjee expresses helplessness, arguing whether it is at all possible to recover precolonial histories of alternately connected pasts. She considers the weight of vast amount of ethnology that went into specific construction of particular "connected histories" during the colonial times. Indrani Chatterjee, "Connected Histories," quote on 70.

or national context alone. This means purposefully locating archives on multiple continents, going beyond the trend of archival research and fieldwork in the imperial “center” and a specific “periphery” alone. Multi-sited archival work opens the possibility of looking beyond national frames. It helps in coming to grips with facts and imaginaries that do not align exclusively with the views of the colonial state or the national state. In his study of changes undergone by the caste system under colonialism, Nicholas Dirks called the colonial state “an ethnographic state,” which was engaged in the ethnological work of generating information.³³ To go beyond the colonial archives, then, is to get past the colonial vision.³⁴ The use of multiple archives by globally oriented scholars in South Asia helps counter the dominant perspective favored by the local state. Historians of science, medicine, and technology have heeded this call and deliberately sought to go beyond the colonial and imperial archives while tracking transnational artifact and knowledge flows or detecting transnationally connected histories of illness and relief. Using texts that circulate, experts and artifacts that move, and dispersed epistemologies, these historians have highlighted the “externalities” that have a bearing on colonial and national histories.³⁵

In the post-World War II context, the global spread of “American modernization” offers a template to South Asianists to connect local histories of technology with a broader global story. In an emphasis which can be called derivative at best, U.S. historians of American foreign relations have examined the salience of American modernization for specific technological realms in India.³⁶ The history of the Indian subcontinent in these accounts may not be particularly detailed, and there is little doubt that the perspectival choice made by these authors is an American one. And yet these histories, even when told from an Americanist perspective, throw light on a hidden translocal side of the South Asian technological experience. They provide a mine of information that awaits further exploration. How did Indian actors connect with an Americanist modernization that

33. Nicholas Dirks, *Castes of Mind*.

34. Antoinette Burton, ed., *Archive Stories*.

35. Anne Digby, Waltraud Ernst, and Projit B. Mukharji, *Crossing Colonial Histories*; Prakash Kumar, *Indigo Plantations and Science in Colonial India*; Amit Prasad, *Imperial Technoscience*. All of these track transcontinental flows of artifacts, experts, and epistemologies.

36. These historians start by exploring the distinctively unique brand of American “modernization” that coalesced in social science disciplines in the United States in the middle decades of the twentieth century. This provided the ideological bulwark for the specific drive to export “development” by the United States State Department and by non-state actors to postcolonial nations. These scholars, for instance, have recently written global histories of the green revolution, community development, and the population control movement and have portrayed the India-specific segment of those histories as part of the history of American foreign relations. Matthew Connelly, *Fatal Misconception*; Nick Cullather, *The Hungry World*; Daniel Immerwahr, *Thinking Small*; David Engerman, *The Price of Aid*.

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was writ large on the Indian subcontinent, whether in the history of agricultural modernization and rural uplift, population control, or industrial modernization?³⁷ So far, South Asianists are only scratching the surface of this abundant material that affords itself well to exploring the engagement of Indian groups and classes with the post-World War II brand of American modernization.³⁸

South Asianists have also reckoned with the fact of India's postcolonial status in an internally heterogeneous global terrain which replicates the inequities of nineteenth-century world order.³⁹ The distinct process of state formation in India, its position within a global economic system shaped by traits of late capitalism, and its limited domestic capacity determine the nature of India's postcoloniality. South Asianists recognize the dominance of the United States, but also simultaneously the presence of additional, contingent, and variable "centers." Moving beyond older notions of dominance versus resistance or autonomy, they speak of "entanglements." Kaushik Sundar Rajan's history of biotechnology, involving multi-sited ethnological work in Silicon Valley and places such as New Delhi, Hyderabad, and Bombay, shows the nature of these entanglements. In his examples, for instance, the nationalism of genomics experts and entrepreneur NRIs (Non Resident Indians) in the Silicon Valley is matched by a supportive, postcolonial project of nationalism in India, where certain forms of genomics find government support. Sundar Rajan concludes that the technoscientific imagination in India "is not a simple case of Third World science and technology." There are real, structural tensions between dominant hegemonic imaginaries and postcolonial, nationalist imaginaries in India. The latter "simultaneously submit to and resist American hegemony in ways that lead to manifestations of market logic, state action, and scientific development that diverge in incongruous ways from what gets conceived in ideologies of innovation and technology transfer."⁴⁰

Despite the obvious inequities of the global order, historians in South Asia have continued to build their histories around the notion of "co-production" of meanings and values associated with specific technologies. The technologies themselves and their meanings are tied up with local, hierarchical epistemology and culture, and do not reflect straightforward rela-

37. The American intervention on the subcontinent can be alternatively framed as an imperial presence in addition to being a global, hegemonic presence. But by and large, existing works have assessed the American impact in global terms.

38. Akhil Gupta's work on agrarian development in twentieth-century India deploys ethnology to delve deep into Indian farmers' sensitivities and their agentic engagement with modernist features of agricultural change. But studies like these are exceptions rather than the norm. A full-throttle exposition of "Indian" engagement with American modernization is tenuous at best. Akhil Gupta, *Postcolonial Developments*. See also Ross Bassett, *The Technological Indian*.

39. P. Chatterjee, *The Black Hole of Empire*.

40. Kaushik Sundar Rajan, *Biocapital*, quotes on 35.

tions of domination and autonomy. Amit Prasad's history of magnetic resonance imaging technology in the United States, Britain, and India shows how technological efforts in all three locales were impacted by the transition to "Big Science." India was by all means a global node in this transition, but the transition made a different impact in different national and institutional contexts even as it cast its shadow on all. In a similar mold, for the colonial period, Prakash Kumar's work has tracked the local manifestation of a global process of transition from agricultural to synthetic dyes in a history of colonial indigo plantations in Bengal.⁴¹

Conclusion

To return to the question of what is different in the South Asian history of technology, one can perhaps reiterate that the technology stories from India mirror the range of conventions within which much of South Asian historiography has come to rest. These are visible in a sustained analysis of how technology is caught up in colonial relations; an attention to development and modernization through a scrutiny of the new socio-economic order that the postcolonial state has sought to build; a focus on the subjectivities of classes and identities; and an attention to global flows of knowledge and frictions they encounter.⁴² Writing within those conventions, the contributions to this issue reflect the methodological eclecticism, theoretical debts, and the ethical commitment to asking questions of exclusion that are considered routine in South Asia. Given such commitments, it is then no surprise that scholars of South Asian technology do not stop by simply demonstrating that technology is an instrument for domination. Indeed, that is where the analysis starts to shape up. This changing thrust of analytical work is apparent in decreasing interest in "introduction" of new technologies by the colonial authorities or in any straightforward narrative of "transfer" of technology or "technological assistance" from the global north. Instead, scholars have invested their energy in exploring the specific ways the colonial context or the postcolonial condition facilitated the operation of power and met with subversive acts. Similarly, they routinely start by going behind the claims of modernization and development by embedding their analysis of the latter tropes in questions of resource distribution and claims of justice. There are now specialist STS journals open to embracing key innovations of South Asian historiography. Within U.S. academia, there is a critical mass of scholars who are willing to attend to cross-over interests. The timing could not be better for historians to harness the productive tension of concepts and methods in STS and South Asian

41. Prasad, *Imperial Technoscience*; Prakash Kumar, *Indigo Plantations and Science in Colonial India*.

42. Anna Tsing, *Friction*.

Studies. Tapping into the generative potential of such tensions is the goal of this volume.

Bibliography

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- Abraham, Itty. "Landscape and Postcolonial Science." *Contributions to Indian Sociology* 34, no. 2 (2000): 163–87.
- Alter, Joseph. *Yoga in Modern India: The Body Between Science and Philosophy*. Princeton: Princeton University Press, 2004.
- Arnold, David. *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India*. Berkeley: University of California Press, 1993.
- _____. *Everyday Technology: Machines and the Making of India's Modernity*. Chicago: University of Chicago Press, 2013.
- Bassett, Ross. *The Technological Indian*. Cambridge, MA: Harvard University Press, 2016.
- Baviskar, Amita. *In the Belly of the River: Tribal Conflicts Over Development in the Narmada Valley*. New Delhi: Oxford University Press, 2004.
- Bayly, Christopher. *Empire and Information: Intelligence Gathering and Social Communication in India, 1780–1870*. Cambridge, UK: Cambridge University Press, 2000.
- Bose, Sugata. "Instruments and Idioms of Colonial and Nationalist Development: India's Historical Experience in Comparative Perspective." In *International Development and the Social Sciences: Essays on the History and Politics of Knowledge*, edited by Frederick Cooper and Randall Packard, 45–63. Berkeley: University of California Press, 1997.
- _____. *A Hundred Horizons: The Indian Ocean in the Age of Global Empire*. Cambridge, MA: Harvard University Press, 2009.
- Briggs, Asa. *The Age of Improvement*. Harlow, UK: Pearson, 1959.
- Burton, Antoinette, ed. *Archive Stories: Facts, Fictions, and the Writing of History*. Durham: Duke University Press, 2006.
- Chakrabarti, Pratik. *Western Science in Modern India: Metropolitan Methods, Colonial Practices*. Ranikhet, IN: Permanent Black, 2004.
- Chakrabarty, Dipesh. "Bernard Cohn: In Memoriam." Foreword to *Bernard Cohn, The Bernard Cohn Omnibus*, ix–xix. New Delhi: Oxford University Press, 2004.
- _____. *Provincializing Europe: Postcolonial Thought and Historical Difference*. Princeton: Princeton University Press, 2000.
- _____. "Subaltern Studies and Postcolonial Historiography." *Nepantla: Views from South* 1, no. 1 (2000): 9–32.
- Chandra, Uday. "Towards an Adivasi Studies: New Perspectives on the 'Tribal' Margins of Modern India." *Studies in History* 31, no. 1 (2015): 122–27.

- Chatterjee, Indrani. "Connected Histories and the Dream of Decolonial History." *South Asia: Journal of South Asian Studies* 41, no. 1 (2018): 69–86.
- _____. *Forgotten Friends: Monks, Marriages, and Memories of Northeast India*. Delhi: Oxford University Press, 2013.
- Chatterjee, Partha. *The Black Hole of Empire: History of a Global Practice of Power*. Princeton: Princeton University Press, 2012.
- _____. "Democracy and Economic Transformation in India." *Economic and Political Weekly* 43, no. 6 (2008): 44–49.
- _____. *Lineages of Political Society*, Ranikhet, IN: Permanent Black, 2012.
- _____. *The Nation and its Fragments: Colonial and Postcolonial Histories*. Princeton: Princeton University Press, 1993.
- _____. *The Politics of the Governed: Reflections on Popular Politics in Most of the World*. New York: Columbia University Press, 2006.
- _____, trans. "Rethinking Postcolonial Capitalist Development: A Conversation between Kalyan Sanyal and Partha Chatterjee." *Comparative Studies of South Asia, Africa and the Middle East* 36, no. 1 (2016): 102–11.
- Cohen, Lawrence. *No Aging in India: Alzheimer's, the Bad Family, and Other Modern Things*. Berkeley: University of California Press, 1998.
- Cohn, Bernard. *An Anthropologist Among the Historians and Other Essays*. Delhi: Oxford University Press, 1987.
- _____. *Colonialism and its Forms of Knowledge: The British in India*. Princeton: Princeton University Press, 1996.
- Connelly, Matthew. *Fatal Misconception: The Struggle to Control World Population*, Cambridge, MA: Belknap Press, 2010.
- Cooper, Frederick. *Colonialism in Question: Theory, Knowledge, History*. Berkeley: University of California Press, 2005.
- Cullather, Nick. *The Hungry World: America's Cold War Battle against Poverty in Asia*. Cambridge, MA: Harvard University Press, 2013.
- Dasgupta, Sangeeta. "Introduction: Reading the Archive: Reframing 'Adivasi' History." *Indian Economic and Social History Review* 53, no. 1 (2016): 1–8.
- _____, and Daniel J. Rycroft. *The Politics of Belonging in India: Becoming Adivasi*. London: Routledge, 2011.
- Davis, Donald R. "Three Principles for an Asian Humanities: Care First . . . Learn From . . . Connect Histories." *Journal of Asian Studies* 74, no. 1 (2015): 43–67.
- Digby, Anne, Waltraud Ernst, and Projit B. Mukharji. *Crossing Colonial Historiographies: Histories of Colonial and Indigenous Medicines in Transnational Perspective*. Newcastle upon Tyne: Cambridge Scholars Publishing, 2010.
- Dirks, Nicholas. *Castes of Mind: Colonialism and the Making of Modern India*, Princeton: Princeton University Press, 2001.

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- Engerman, David. *The Price of Aid: The Economic Cold War in India*. Cambridge, MA: Harvard University Press, 2018.
- Ferguson, James. *The Anti-Politics Machine: Development, Depoliticization, and Bureaucratic Power in Lesotho*. Minneapolis: University of Minnesota Press, 1994.
- Gidwani, Vinay. *Capital Interrupted: Agrarian Development and the Politics of Work in India*. Minneapolis: University of Minnesota Press, 2008.
- Goswami, Manu. "Partha Chatterjee Interviewed by Manu Goswami." *Public Culture* 25, no. 1 (2013): 177–89.
- Guha, Ranajit. *Dominance without Hegemony: History and Power in Colonial India*. Cambridge, MA: Harvard University Press, 1998.
- _____. *Elementary Aspects of Peasant Insurgency in Colonial India*. Delhi: Oxford University Press, 1983.
- Gupta, Akhil. *Postcolonial Developments: Agriculture in the Making of Modern India*. Durham: Duke University Press, 1998.
- Hardiman, David, and Projit Mukharji. *Medical Marginality in South Asia: Situating Subaltern Therapeutics*. London and New York: Routledge, 2012.
- Headrick, Daniel. *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century*. New York: Oxford University Press, 1981.
- Immerwahr, Daniel. *Thinking Small: The United States and the Lure of Community Development*. Cambridge, MA: Harvard University Press, 2015.
- Kumar, Deepak. *Science and the Raj, 1857–1905*. Delhi: Oxford University Press, 1998.
- Kumar, Prakash. *Indigo Plantations and Science in Colonial India*. New York: Cambridge University Press, 2012.
- Machado, Pedro. *Ocean of Trade: South Asian Merchants, Africa and the Indian Ocean, c.1750–1850*. Cambridge, UK: Cambridge University Press, 2014.
- Mathew, Johan. *Margins of the Market: Trafficking and Capitalism across the Arabian Sea*. Berkeley: University of California Press, 2016.
- Mitchell, Timothy. *Rule of Experts: Egypt, Techno-Politics, Modernity*. Berkeley: University of California Press, 2002.
- Nandy, Ashis. *The Intimate Enemy: Loss and Recovery of Self Under Colonialism*. Delhi: Oxford University Press, 1988.
- Nigam, Aditya. "Partha Chatterjee Interviewed by Aditya Nigam." *Development and Change* 45, no. 5 (2014): 1059–73.
- Omvedt, Gail. *Cultural Revolt in a Cultural Society: The Non-Brahman Movement in Western India, 1873–1930*. Bombay: Scientific Socialist Education Trust, 1973.

- _____. *Dalits and the Democratic Revolution: Dr. Ambedkar and the Dalit Movement in Colonial India*. Delhi: Sage Publication, 1994.
- _____. *Seeking Begumpura*. New Delhi: Navayana Publishing, 2008.
- Pandian, Anand. *Crooked Stalks: Cultivating Virtue in South India*. Durham: Duke University Press, 2009.
- Parthasarathi, Prasanna. "The State of Indian Social History." *Journal of Social History* 37, no. 1 (Autumn 2003): 47–54.
- Phalkey, Jahnvi. *Atomic State: Big Science in Twentieth-Century India*. Ranikhet, IN: Permanent Black, 2013.
- Prakash, Gyan. *Another Reason: Science and the Imagination of Modern India*, Princeton: Princeton University Press, 1999.
- _____. "Writing Post-Orientalist Histories of the Third World: Perspectives from Indian Historiography." *Comparative Studies in Society and History* 32, no. 2 (April 1990): 383–408.
- Prasad, Amit. *Imperial Technoscience: Transnational Histories of MRI in the United States, Britain, and India*. Cambridge, MA: MIT Press, 2014.
- _____. "'Things Do Look Different from Here, on the Borderlands': An Interview with Warwick Anderson." *Science, Technology & Society* 22, no. 1 (2017): 135–43.
- Raj, Kapil. "Beyond Postcolonialism . . . and Postpositivism: Circulation and the Global History of Science." *Isis* 104, no. 2 (June 2013): 337–47.
- _____. *Relocating Modern Science: Circulation and the Construction of Knowledge in South Asia and Europe, 1650–1900*. New York: Palgrave, 2007.
- Rajan, Kaushik Sundar. *Biocapital: The Constitution of Postgenomic Life*. Durham: Duke University Press, 2006.
- Roy, Indrajit. *Politics of the Poor: Negotiating Democracy in Contemporary India*. New Delhi: Cambridge University Press, 2018.
- Sanyal, Kalyan. *Rethinking Capitalist Development: Primitive Accumulation, Governmentality and Post-Colonial Capitalism*. New Delhi: Routledge, 2013.
- Sarkar, Sumit. *Writing Social History*. Delhi: Oxford University Press, 1999.
- Sen, Amartya. "Capability and Well-Being." In *The Quality of Life*, edited by Martha Nussbaum and Amartya Sen, 30–53. Oxford: Clarendon Press, 1993.
- _____. *Development As Freedom*. Delhi: Oxford University Press, 1999.
- _____. "Well-Being, Agency and Freedom: The Dewey Lectures." *Journal of Philosophy* 82, no. 4 (April 1985): 169–221.
- Shah, Alpa. *In the Shadows of the State: Indigenous Politics, Environmentalism, and the Insurgency in Jharkhand, India*. Durham: Duke University Press, 2010.
- Siddiqi, Asif. "Science, Geography, and Nation: The Global Creation of Thumba." *History and Technology* 34, no. 4 (2015): 420–51.

- Singh, Upinder, and Parul Pandya Dhar, eds. *Asian Encounters: Exploring Connected Histories*. New Delhi: Oxford University Press, 2014.
- Stokes, Eric. *The English Utilitarians and India*. Oxford: Clarendon Press, 1959.
- Subrahmanyam, Sanjay. "Connected Histories: Notes Towards a Reconfiguration of Early Modern Eurasia." *Modern Asian Studies* 31, no. 3 (1997): 735–62.
- OCTOBER
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- _____. *Explorations in Connected History: From the Tagus to the Ganges*. Delhi: Oxford University Press, 2005.
- Tsing, Anna. *Friction: An Ethnography of Global Connection*. Princeton: Princeton University Press, 2005.
- Witsoe, Jeffrey. *Democracy Against Development: Lower-Caste Politics and Political Modernity in Postcolonial India*. Chicago: University of Chicago Press, 2013.