Modern Asian Studies **46,** 1 (2012) pp. 1–17. © Cambridge University Press 2011
doi:10.1017/S0026749X11000540 First published online 4 November 2011

Everyday Technology in South and Southeast Asia: An introduction

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That technology matters—and matters profoundly—to the humanities and social sciences is no longer in dispute. But exactly how it informs our understanding of society, now and in the past, remains a matter of scholarly contention. It might be argued that, as the history and sociology of technology moves away from its principal point of origin in the study of Euro-American societies, the questions that technology poses have, if only by virtue of their relative novelty, a particular resonance for the constituent regions of modern Asia—and not least for the societies of South and Southeast Asia that form the subject of this special issue. It is not a question of adopting an approach as unsubtle and outmoded as technological determinism, or of simply extending to one corner of the Asian landmass a set of 'global' theories and histories, with technology as their underpinning, already established and familiar in other contexts. Rather, it is a case of finding and developing a perspective on technology which helps to illuminate the inner histories and local narratives of these regions and which brings to the wider discussion of technology something distinctive, distilled from the outlook and experience of one part of the non-Western world. A desire to move beyond scholarship's still-dominant paradigms of colonialism, nationalism, and development, to explore the multivalent nature of 'everyday life' and enquire into 'the social life of things' as locally constituted, to examine modernity's diverse material forms, technological manifestations, and ideological configurations, to locate the regional roots as well as the exogenous origins of social change and cultural transformation, to situate subaltern experience alongside middle class mores and elite

* With special thanks to Sarah Teasley for her most helpful comments on an earlier draft of this Introduction.

appropriation—all these interlocking considerations have begun to form part of a collective inquiry into the technological histories and cultures of South and Southeast Asia. A scholarly search is clearly under way to establish new methodologies and meanings, new contexts, and conjunctures, which will inform and reinvigorate the history, sociology, anthropology, and geography of these regions and redefine their place within the burgeoning field of science and technology studies.

Until recently much academic endeavour (and, beyond it, public attitudes at large) has tended to view technology either expansively and externally, from an imperial, post-imperial, and global-capitalist perspective on indigenous societies, or, far more narrowly, from the relative isolation of a single colonial territory or nation-state, seeing the local absorption and transformation of global goods and knowledge discretely and unconnected with their existence elsewhere. While recognizing the global dimensions of technological modernity and the imperial and national uses of technological progress, the papers in this volume seek to recentre the discussion of technology within the local settings in which specific technologies (or, since innovative technologies seldom function alone, technological clusters) came to assume particular significance for colonial and post-colonial South and Southeast Asia. In so doing, these papers, first presented at a conference at the University of Warwick in March 2010,[1] seek to collectively augment histories of technologies whose principal plot lines still remain insufficiently global (or, indeed, narrowly metropolitan) in their orientation as well as to understand the role of technology as instrument and agent in the transformations affecting everyday life in these regions of monsoon Asia from the 1880s onwards.[2] By looking across the divide between the late-colonial and the post-colonial and by considering the history of 'everyday technology' trans-regionally, the papers try to establish a degree of

[1] The conference, and the project on 'Everyday Technology in Monsoon Asia, 1880–1960' of which it formed part, was made possible by funding from the Economic and Social Research Council. The authors wish to thank the Economic and Social Research Council for its support, and delegates at the conference for their keen participation.

[2] The term 'monsoon Asia' might appear dated, but it helps capture some of the technological commonalities which affected societies across the wider region, as for instance in the cultivation and processing of rice as the staple food crop or in the socio-economic importance of plantation commodities like coffee, tea, and rubber. See V. D. Wickizer and M. K. Bennett, *The Rice Economy of Monsoon Asia* (Stanford: Stanford University Press, 1941), pp. 1–4.

commonality in the technological changes which occurred in settings that, while disparate in themselves, nonetheless invite comparisons and suggest connections.

Why '*everyday* technology'? Recent discussion of technology in nineteenth- and twentieth-century Asia has begun to move away from earlier insistence on the centrality of imperial agency and the instrumentality of empire's 'tools' of conquest and exploitation. Enquiry has in part (but by no means entirely) shifted away from a diffusionist preoccupation with a system of one-way 'technology transfers' that privileged Euro-American innovation over local agency, and from seeing technology in terms of European representations of machines as the measure of the imperial self and colonized other.[3] A language of 'transfers', 'diffusions', and global 'commodities' tells us remarkably little about how and why machines, whose alien provenance was often quite literally written all over them, came to be constituted as local goods, subject to local usages and vernacular understandings.[4] Equally, there has been a tendency to move away from the prominence hitherto given to 'big technologies'—the railways, telegraphs, steamships, the irrigation schemes, and electrification projects (capital-intensive, often state-managed or state-monopolized, technologies that figured so prominently in the rhetoric and self-representation of imperial aggrandisement and which have hitherto commanded the bulk of scholarly attention)[5]—in favour of the kinds of small, more personalized machines and 'everyday technologies', from bicycles and sewing-machines to the gramophone and the radio, that colonial and post-colonial regimes were rarely

[3] Daniel R. Headrick, *The Tools of Empire: Technology Transfer in the Age of Imperialism, 1850–1940* (New York: Oxford University Press, 1981); idem, *The Tentacles of Progress: Technology Transfer on the Age of Imperialism, 1850–1940* (New York: Oxford University Press, 1988); Roy MacLeod and Deepak Kumar (eds), *Technology and the Raj: Western Technology and Technical Transfers to India, 1700–1949* (New Delhi: Sage, 1995); Michael Adas, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance* (Ithaca: Cornell University Press, 1989).

[4] There have been some significant pioneering studies that have begun to look at global goods, like the Singer sewing-machine, from an essentially local perspective, notably Andrew Gordon, 'Selling the American Way: The Singer Sales System in Japan, 1900–1938', *Business History Review*, 82 (4), 2008, pp. 671–99. For a contrasting 'global' approach, see Andrew Godley, 'The Global Diffusion of the Sewing Machine, 1850–1914', *Research in Economic History*, 20, 2001, pp. 1–45.

[5] On the issues raised by studying 'big technologies', see John Krige (ed.), 'Choosing Big Technologies', Special issue, *History and Technology*, 9 (1–4), 1992; Donald Cardwell, *The Fontana History of Technology* (London: Fontana Press, 1994), Chapters 17–18.

able (or disposed) to monopolize for themselves and which passed with seeming rapidity and apparent ease into the work regimes, entrepreneurial enterprises, recreational activities, social lives, and cultural aspirations of a significant portion of colonial and post-colonial populations.[6] The study of technology is arguably best seen as a study of social life and material culture and thus from outside many of the conventional perspectives of the history and sociology of technology. The story of the 'everyday' (itself a much debated term)[7] is thus likely to give rise to a user-based, people-oriented study rather than a state-driven, externally envisioned one. From the perspective of present-day Asia there seems, as Clancey points out, 'something of a disconnect' been the 'classical' history of technology in Asia, with its emphasis on grand colonial and national projects, and 'the present dense landscape of Asian-made and Asian-used devices, many of them personal, mobile, electronic, and lively, but indeterminate in their genealogies'.[8] It is that apparent 'indeterminacy' that this set of research papers tries to illuminate and in part resolve.

It can, even so, be questioned how far 'everyday' technology can be meaningfully differentiated from any other kind of technology or regarded collectively as the sharing of a common identity. It is not intended to suggest a kind of blanket uniformity, but rather to give expression to the singularity and diversity of forms that everyday technology might take. Everydayness, as several of the contributors here reflect, can be interpreted in a variety of different ways, and these need not exclude, as Sharika Thiranagama suggests, the everydayness of perception, identity, and experience associated with a 'big' technology like a railroad. In discussing a world that

[6] See Nancy Rose Hunt, *A Colonial Lexicon of Birth Ritual, Medicalization, and Mobility in the Congo* (Durham, North Carolina: Duke University Press, 1999), for its invocation of the practical and symbolic role of the bicycle, and Suzanne Moon, *Technology and Ethical Idealism: A History of Development in the Netherlands East Indies* (Leiden: CNWS Publications, 2007), for small-scale technologies in Dutch colonial policy. For the theoretical and methodological issues involved, see Gabrielle Hecht and Warwick Anderson (eds), Special issue on 'Postcolonial Technoscience', *Social Studies of Science*, 32 (5–6), 2002.

[7] There is a wide theoretical literature on what constitutes 'the everyday', including Henri Lefebvre, *Critique of Everyday Life, Volume I: Introduction*, trans. John Moore (London: Verso, 2008); Michel de Certeau, *The Practice of Everyday Life*, trans. Steven Randall (Berkeley: University of California Press, 1984); Harry Harootunian, *History's Disquiet: Modernity, Cultural Practice, and the Question of Everyday Life* (New York: Columbia University Press, 2000).

[8] Gregory Clancey, 'The History of Technology in Japan and East Asia', *East Asian Science, Technology and Society*, 3, 2009, p. 529.

was largely under the sway of colonial powers, there was a tendency among contemporaries (a tendency from which scholars have not been altogether immune) to identify technology in its grander forms with the ideological aspirations, the political priorities, and economic exigencies of the colonial state—it might, echoing Nye, be dubbed the 'imperial technological sublime'[9]—rather than with the daily needs, interests, and agency of the mass of the colonized population. The perspective of the state is certainly not without importance, and, indeed, it surfaces, or becomes a critical presence, in several of these papers, including those by David Biggs, Michitake Aso, and (in its municipal variant) Tilman Frasch. Viewed negatively, this might connote the colonial regime's prohibition or tacit discouragement of existing technological practices—shifting cultivation, unlicensed hunting, the right of indigenes to bear arms, or to use print technology with adversarial intent. Or, as Erich DeWald and Chua Ai Lin suggest, the state might be rather slow in seizing the political possibilities created by a new technology like the radio. The state's presence might signify, as discussed in Aso's essay on 'improvement' strategies for rubber cultivation in colonial Vietnam, the external drive to change the seemingly 'timeless' way in which local cultivators went about their work and employed their tools and skills. But significantly, as his case-study also indicates, top-down, statist plans did not necessarily meet (in the short term at least) with their intended success. Resistance to, or evasion of, technological innovation might apply as much (perhaps still more) to 'small' technologies as to 'big' ones and inhibit the possibility of their becoming genuinely everyday.

But the state was by no means the only actor or the sole site of technological dissent. As Aso reminds us, there is an extensive literature—especially in regard to the West—about the ways in which technology is socially constructed and grows symbiotically with society, both shaping and being shaped by it.[10] 'Our technologies,' as Bijker and Law put it, 'mirror our societies', and they add: 'There is no real way of distinguishing between a world of engineering on the one hand and

[9] David E. Nye, *American Technological Sublime* (Cambridge, Massachusetts: MIT Press, 1994).

[10] See especially Wiebe E. Bijker, Thomas P. Hughes and Trevor J. Pinch (eds), *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology* (Cambridge, Massachusetts: MIT Press, 1987); Wiebe E. Bijker, *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change* (Cambridge, Massachusetts: MIT Press, 1995).

a world of the social on the other.'[11] In their various ways the papers in this collection speak to the importance of technology's social (and, it might be stressed, cultural) fashioning. However, 'socio-technical' change is a more problematic concept to employ in an Asian colonial or post-colonial context than in relation to autonomous European and North American industrial societies, since in many of the former, objects of everyday use were neither designed nor manufactured locally and so could not, in their original form, bear the imprint of local society. Many technological goods such as the bicycle, the typewriter, the telephone or, as Jean Gelman Taylor discusses here with respect to the Dutch East Indies, the sewing-machine—and the camera through which its local assimilation can be visually documented—were developed thousands of miles away from South and Southeast Asia and reflect the socio-technical changes that were taking place in those distant societies.[12] India, Indonesia, and Indochina had no part in the initial design or manufacture of these novel technological goods, even if they received them relatively soon, often remarkably soon, after their invention.[13] An argument for the social construction of these technologies in a colonial or semi-colonial context must, therefore, take a different form—in terms of how certain technological goods or practices were locally ignored or rejected, were subjected to significant local emendation and reinvention (like the various forms of the Asian cycle-rickshaw, itself a demonstration of substantial intra-regional diversity), were reworked and reappropriated to conform with local cultural norms and social usages, or as Raquel Reyes suggests in relation to middle class society in Manila, became part of a changing world of taste, fashion, and consumerism that was neither purely 'traditional' nor entirely derivative of the West.[14]

[11] Wiebe E. Bijker and John Law, 'General Introduction', in Wiebe E. Bijker and John Law (eds), *Shaping Technology/Building Societies: Studies in Sociotechnical Change* (Cambridge, Massachusetts: MIT Press, 1992), pp. 3–4.

[12] A classic example of this is found in Friedrich A. Kittler, *Gramophone, Film, Typewriter* (Stanford: Stanford University Press, 1999).

[13] For the impact of 'modernizing goods' on another non-Western society, see Arnold J. Bauer, *Goods, Power, History: Latin America's Material Culture* (Cambridge: Cambridge University Press, 2001) Chapter 5, though this account tends to downplay local innovation and adaptation.

[14] Taylor suggests in her paper, as an example of this, Islamic pronouncements on the suitability or otherwise of Indonesian women riding bicycles. An example from India might be the annual practice among Hindus of marking machines, office equipment, and household goods to ensure their auspiciousness during the following year. See Gilbert Slater, *Southern India: Its Political and Economic Problems* (London: Allen and Unwin, 1936), p. 164.

Hence, everyday technologies of the kind discussed here—those that could be purchased, hired or 'owned' in a broad cultural sense—might be far more readily assimilated than most 'big' technologies precisely because their foreignness could be domesticated to comply with the everyday work regimes, cultural needs, and intimate lives of the people. As Biggs shows with regard to motorized boat technology in the Mekong Delta, local initiatives could lead to the appropriation and adaptation of a once-foreign technology in order to meet local environmental, transport, and marketing needs, especially in a context where colonial and post-colonial 'big' technologies had either failed or, perhaps unwittingly, had created material conditions and a fund of technical expertise conducive to local innovation.[15]

In the late-colonial era, the period with which these papers are primarily concerned, the availability of new, small-scale technological goods, while seldom as widespread as in contemporary Europe and North America, might still be extensive and fundamental to facilitating a strong sense of local ownership and identity, even with machines whose foreign provenance—a Singer sewing-machine, a Raleigh bicycle, a Ford motorcar—was entirely obvious. As Taylor shows in connection with sewing-machines in the Dutch East Indies, such 'mundane' objects could readily—and quietly, without the fanfare that greeted the opening of a new railway line or hydroelectric dam—enter into the everyday lives of Europeans and indigenes, reflecting and informing changes in lifestyles, employment practices, clothing styles, and consumer tastes. The multiplicity of colonial regimes in Southeast Asia—British, French, Dutch, American—and the extent of migration into and within the region further added to the complexity of cultural influences and social agency in the adoption of the machine and the processes of use and appreciation involved. An Indian, Javanese or Vietnamese might own a bicycle, acquire one second-hand, borrow one from a cycle-shop, a relative or friend, perhaps acquire one by theft, or possess one by virtue of his (rarely her) employment.[16] Personal use, incorporation into domestic life and daily work-regimes,

[15] The conditions assumed from a Western perspective to favour technological innovation might be reconsidered in the light of such Asian examples. See Joel Mokyr, *The Lever of Riches: Technological Creativity and Economic Progress* (New York: Oxford University Press, 1990), pp. 11–12.

[16] Kees van Dijk, 'Pedal Power in Southeast Asia', in Jan van der Putten and Mary Kilcline Cody (eds), *Lost Times and Untold Tales from the Malay World* (Singapore: NUS Press, 2009), pp. 268–82; David Arnold and Erich DeWald, 'Cycles of Empowerment? The Bicycle and Everyday Technology in Colonial India and Vietnam', *Comparative Studies in Society and History*, 53 (4), 2011, pp. 971–96.

the opportunities for borrowing, the responsibilities of ownership—all these contributed to the everydayness of the modern machine. As the essays by Frasch and David Arnold indicate, modern transport machines—trams, motorcars, motorcycles, as well as the humbler technology of bicycles and cycle-rickshaws—became a familiar part of city life across the regions, from Karachi to Hanoi, facilitating public life and individual mobility, transforming the socio-economic life and spatial morphology of the city. If the coming of these novel modes of transport demonstrated the importance of electricity and the internal combustion engine (whose significance in rural life Biggs also emphasizes) to the rapid proliferation of everyday engagement with machines across South and Southeast Asia, it also showed the social tensions created by their use, tensions that revealed the racial, class, and gender divisions in colonial and post-colonial Asian societies. The proliferation of both machines and everyday human interactions with them inspired the emergence of new social and political exigencies. The everyday technologies examined in the papers by Arnold, Biggs, and Frasch, as well as in DeWald's account of the radio in colonial Vietnam, posed problems that demanded new regimes of ordering and governance. As Arnold further demonstrates, the concept of traffic as a 'problem', a disorderly conduct that demanded the ordering of society and the disciplining of its members, was an important instance of the way in which late-colonial India sought to fashion its technological modernity.

Like 'everyday', 'modernity' is a term that has been deployed to serve a wide variety of meanings and intents. In the context of the papers presented here, a degree of distinction might be in order. Technology in its myriad different forms is seen to be a central feature of the wider world of the modern, even though the nature of the specific technology might not itself be modern (in the sense of being of recent invention or manufacture). It could be modern in the manner in which a given technology or set of technologies was perceived, positively or adversarially, within a modern context. In the case of India, the Gandhian critique of modern technology helped shape the wider understanding of what India's modernity should be. Technology informed modernity across South and Southeast Asia but it did so in several variant forms and not in a single, metropolitan manner. It often did so by drawing eclectically (as Reyes' essay stylishly suggests) from a variety of sources—from a real or imagined past, from the United States and Japan as much as from a present colonial power like Britain or the Netherlands, from local fashion,

practicality, and inspiration as well as from imported tastes, forms, and ideals. Moreover, in speaking of techno-modernity we are looking at a specific field of human perception and activity that might not simply be equated with, say, political modernity or a Nehruvian belief in the modernity of scientific method and rationality. Technological modernity might be—and often was—something far more pragmatic, mundane, and experiential than many current and rather grandiose interpretations of modernity would seem to suggest.

That technological modernity was no more an unalloyed gain in colonial Asia any more than anywhere else is evident from several of these papers. Given the propensity of modern technology to produce noise and discomfort, its ability to propagate conflict, exploitation, and violence, technological change might more often be suffered than aesthetically savoured or politically endorsed. It might as well be resisted as assimilated, points emphasized by both Arnold and DeWald. It might, furthermore, be an arena where those with differing visions of home and country or different strategies for mitigating suffering and increasing prosperity might wage their battles, as Biggs' paper on Vietnam and Thiranagama's paper on Sri Lanka attest. We should not forget techno-modernity's capacity to sow discord and suffering.

But the remit of the everyday clearly does not end there. Machines are matters of mind, not mere expressions of a material reality. In a scholarly setting 'everydayness' might be more a matter of how a given technology is understood, given context, and meaning, than any quality intrinsic to a specific technology or technological good. An individual might not (technically speaking) own a railroad or a tramway and yet by the early twentieth century these had become integral to the daily lives of many city-dwellers and figured repeatedly in fictionalized and cinematic representations of everyday life by the 1930s and 1940s. The archive of the everyday is to be found less often in official files than in diaries, novels, and newspapers, in the self-representation of the people rather than in the pronouncements of the state. The poor (or relatively poor) might not own a motorcar, but they might be familiar with its form and functions through being a back-street mechanic, a petrol-pump attendant or—a common role for the colonized in latter-day empires—as someone else's chauffeur. They were likely to encounter cars everyday on the street and learn, as pedestrians, cyclists, ox-cart drivers, and rickshaw-pullers, how best to negotiate their presence. Radios might still belong to the privileged few, but they could be heard daily in tea-shops and urban alleys, be

admired in store windows or desired through newspaper and magazine advertisements. Once rice-milling machines had been installed, as they increasing were across monsoon Asia in the first half of the twentieth century, their operators learned by watching how things were done, by hanging around and helping out rather than by studying manuals or receiving formal training.

In this way everyday technology raises questions of knowledge, not least with respect to what has come to be conceived, perhaps over-grandly, as 'colonial knowledge'. The dissemination of everyday technologies called for the spread of practical know-how. The means by which such, often non-literate, knowledge was acquired, passed on, amended, tested or rejected gave users the ability to make machines work and to repair them when they spluttered and stopped. The processes of observation and experimentation that led users to repair, cannibalize, and adapt both machines and knowledge about them formed part of a rapidly growing and dynamically changing informal knowledge sector in late-colonial and early post-colonial societies. In this extended sense, the 'everyday' in everyday technology connoted a broad familiarity with technological objects, a basic tool-kit of technical skills quite as much as individual possession and personal use. It might signify merely knowing that cars, trains, and airplanes existed, recognizing them as familiar emblems of modern life on street hoardings, cigarette packets, and matchbox labels, in newspapers, magazines, radio programmes, and films. It might mean incorporating them into conversations, dreams, and life-stories, employing them in a technological imaginary that ranged far beyond the practical possibilities of individual possession. But the familiarity of the everyday might also simultaneously imply diverse social perspectives. Part of the value of an 'everyday' approach to the Asian technology of the period is that it enables us to consider comparatively the range of different understandings and usages a particular technology held for those who lived in societies that were deeply divided along lines of race, class, and gender.

The 'everyday' might also signify not just that which had become routine and mundane. An increasingly everyday technology such as the radio might, as Chua and DeWald demonstrate in relation to two different Southeast Asian locales, Singapore and Vietnam, become a means of opening up new imaginaries, new worlds of aspiration and identification, that ranged well beyond the local, the colonial, and the immediately familiar. Although the radio was used by colonial and other modern regimes for propaganda and prestige purposes, it could

also create a technological cosmopolitanism, inventing 'communities of listeners' whose ethereal solidarity could not easily be constrained by local loyalties and parochial politics.

Technology could imply not just instruments for fostering community, for getting to and from work or for completing workaday tasks, such as the typewriters and telephones that increasingly formed part of the routine equipment of clerks, typists, and office workers across South and Southeast Asia. It could also be the means of communicating and personally embodying the technological infrastructure of 'the good life' which modern times might offer. Everyday technology could serve to reference, in an understanding of technology that is more Foucauldian than mechanical,[17] personal discipline, individual identity, and the pursuit of selfhood, a technology of the modern self that embraced both the personal use of machines and a sense of the corporeal discipline that contemporary technologies might impose upon, or require of, the self (as Arnold's discussion of modern traffic suggests). Everyday technologies might be intimately connected to individuals' construction of their professional and personal selves. Reyes' essay thus examines the use by middle class women in Manila of machines to care for, to cure and to make fashionable their bodies and themselves in a manner they deemed necessary to their modern middle class status.[18] And, as Thiranagama's paper further suggests, in moving from colonial to post-colonial times, even a grand, originally state-propelled, technological project such as a railway could in time establish its own regime of intimacy in the selfhood and memory of its actual, would-be or one-time users.

Attempting to identify, let alone define, 'everyday technology' raises a further set of questions in relation to what we understand as the modern histories of South and Southeast Asia. There is, first of all, the colonial question, which assumes a primacy both in terms of chronology (since across much of the region it is with colonialism that the history of techno-modernity conventionally begins) and of

[17] Michel Foucault, 'Technologies of the Self', in Luther H. Martin, Huck Gutman and Patrick H. Hutton (eds), *Technologies of the Self* (London: Tavistock Publications, 1988), pp. 16–49.

[18] On gender and techno-modernity, see the essays in Alys Eve Wenbau, Lynn M. Thomas, Priti Ramamurthy, Uta G. Poiger, Madeleine Yue Dong and Tani E. Barlow (eds), *The Modern Girl Around the World: Consumption, Modernity and Globalization* (Durham, North Carolina: Duke University Press, 2008). For an exploration of technology and gender, see Francesca Bray, *Technology and Gender: Fabrics of Power in Late Imperial China* (Berkeley: University of California Press, 1997).

the prominence scholars have given to the innovative nature of its mechanical intervention and its disciplinary and regulatory presence. But the question needs to be raised, as several of these papers do (perhaps more implicitly than explicitly), whether colonialism, in and of itself, was as powerful a force in technological terms as has generally been assumed. It is clear, for instance, that the source of many of the technological goods (and often of the marketing techniques that accompanied and promoted them) entering South and Southeast Asia from the late nineteenth century onwards was not the colonial power, whether British, French or Dutch, but emanated from the United States, from Germany and Japan, just as the cinema and the radio provided the technological means to access a far wider realm of imagination and information than a single colony or nation-state could provide. Even though some regimes, such as the French in Indochina, might seek to impose a system of imperial preference, to police the airwaves or censor the silver screen, in the main, colonial regimes were in practice unable or ideologically unwilling to prevent the penetration of technological goods or the conveyance of technologically communicated tastes and ideas from outside their own far-from-watertight domains. Or perhaps—in some cases at least—they regarded everyday technologies as too petty to warrant the effort. The two world wars might temporarily stem the flow of German sewing-machines and Japanese bicycles (except where the Japanese were themselves the occupiers), but the disruption of international trade might also, as during the First World War, facilitate the influx of American trucks and automobiles into the regions, creating a strong market position that was not readily surrendered in peacetime. Perhaps post-imperial regimes, intent on dismantling the colonial economic order they had inherited, were better able to reclaim a national space for their own technological goods and services.

More than any simple measure of the direction and strength of commodity flows, new technologies had the ability to cast doubt upon the assumed autonomy of the colony or its invariable dependence on metropolitan markets. American penetration of the region had a long history: the Philippines, perhaps unsurprisingly, was one of the leading consumers of Singer sewing-machines, but this (originally) American brand-name was to be found virtually throughout South and Southeast Asia along with Remington typewriters, Ford motorcars, and Hollywood movies. Gandhi, for all his famed antipathy to modern machines, rarely spoke in public in his later years except through a microphone that had 'Chicago' emblazoned on it. What does

this tell us about the Americanization of territories, along with its local technological practices and its technological imaginary, which were still formally under the imperial sway of European powers—or about the extent of post-independence de-Americanization? What, too, does the rise of Japan as a military power and economic force tell us about the ability of technological goods and influences from within Asia to create (or suggest the possibility of) an alternative technological hegemony—or at least to add to the hotchpotch of competing and intersecting cultural influences?

While technological tastes and usages might reflect and echo consumer practices and market choices in New York, Paris, Amsterdam, London or Berlin, the logic of the local might institute another kind of connectedness. The cultivation of rubber, cotton, tea, and other commercial crops might create common issues of biological techniques and technologies (improved irrigation and harvesting, better seeds, and more effective control of crop diseases and pests) that spanned the regions or ranged beyond into other parts of monsoon Asia, the Pacific, and current or former colonies in Africa, the Middle East, and Latin America. Mechanical rice-milling and the burgeoning consumption of polished white rice created a commonality of taste and desire across the whole arc of monsoon Asia, from India to Japan. Milling and changing food habits spurred the spread of rice-mills and fostered the pan-regional spread of the nutrition-deficiency disease beriberi for which, in turn, new technological solutions had to be found.[19]

Furthermore, as many of these papers attest, the entry of technologies into the everyday formed part of global patterns of change and of continuity that were far from unique to colonial South and Southeast Asia. The movement of contraband commodities, for example, was an issue most states, colonial or not, were obliged to address at this time, just as growing congestion on the roads was of mounting concern throughout the world. Such examples require us to rethink the colonial question—not to deny colonialism a role but to see it as a conduit for a technological modernity, for goods and services not solely of its own making, rather than as the sole driver

[19] On rice-mills and their significance, see Haruka Yanagisawa, 'Growth of Small-scale Industries and Changes in Consumption Patterns in South India, 1910s–1950s', in Douglas E. Haynes, Abigail McGowan, Tirthankar Roy and Haruka Yanagisawa (eds), *Towards a History of Consumption in South Asia* (New Delhi: Oxford University Press, 2010), pp. 51–75; David Arnold, 'British India and the "Beriberi Problem", 1798–1942', *Medical History*, 54 (3), 2010, p. 302–11.

or exclusive constitutive force in what is now familiarly designated 'colonial modernity'. In studying technological modernity in late-colonial and post-colonial Asia, these papers do not ignore the colonial factor. Instead they ask what light can be shed on the colonial condition by South and Southeast Asia's integration into global networks of technology and the global dissemination of technological goods and the associated technologies for governing, disciplining, and using machines—networks that stretched far beyond the confines of relations between the metropole and colony.

Asking the colonial question makes a second point of enquiry—the modernity question—in many ways more problematic. If colonialism was only one factor informing techno-modernity in the colonies and semi-colonies of South and Southeast Asia, do we then need to rethink modernity—and, if so, along what lines? There are several ways in which we might attempt to do so. It is necessary, for instance, to interrogate our own individual understanding of modernity. Our engagement with technological modernity is often a very personal one. We may never have joined a revolution or led a political party but most of us have learned, at some significant stage in our lives, to ride a bicycle, to use a typewriter or to operate a sewing-machine. We are perhaps disposed to see something equally momentous in the lives of others, as a sign (ventriloquizing for Indians, Indonesians, Chinese or Japanese) that 'we too were modern'. Outright physical resistance to everyday technology might be relatively rare but the use of a specific technology, such as a bicycle, might be opposed or its appropriateness questioned by certain sections of the population (especially in relation to use by women but also, perhaps, by children, ethnic minorities, and the lowest social strata). By their denial as much as by their deployment, machines could entrench privilege and reinforce existing socio-political hierarchies. Modernity could be constituted around a rejection of the foreignness (or race-, class- and gender-based privileges) of access to and ownership of modern goods, from automobiles to airplanes. Modernity might lie, however paradoxically, in being able to keep technological modernity at bay the better to speak to (and for) the technologically impoverished masses or to rally popular consent against those elites whom the machine had further privileged and empowered. Mechanized modernity might be an aesthetic; an articulation of pleasure, desire, and the good life; the site for a new sociability around fashions, clubs, and crazes. But it could also signal the predation of the modern mechanical beast in an increasingly mechanized urban jungle: it could be represented

in modern modes of surveillance, oppression, and exploitation. As a manifestation of modernity, technology can hardly be said to have a single register, but perhaps it occupied a particularly contentious and contested place in the societies of South and Southeast Asia.

A third question arises with respect to the temporality and spatiality of everyday technologies. What was the time, what was the place, of Asia's techno-modernity? To begin to answer this question we need to enquire into the physical as well as the social space within which new, everyday technologies came to be located. They appear not only in the factory (arguably an over-privileged site in academic discourse on technological change in these regions, as in many others parts of the world) but in the home, in the street, and the school room, in fields, on waterways and plantations. Everyday technologies were situated not only in relation to social spaces—homes, streets, factories—but also in relation to other technologies. Homes that had a radio were likely to possess a gramophone and a telephone and possibly some of the therapeutic devices Reyes describes. Streets that boasted buses also had trucks, trams, cars, rickshaws, and bicycles, to say nothing of roadside tailors, motor repairmen, and even typists. Technologies commonly function as clusters, as mechanical ensembles, whose interaction speaks to the wider phenomenon of modernity as much as to their individuality.

Do machines have agency? Surely not in the same sense as sentient human beings do, nor if the agency of the object was intended to imply that a certain machine always and everywhere produced the set of consequences—that washing-machines universally produce a certain kind of domesticity or a typewriter invariably creates a certain kind of office environment. But, as several of the papers here suggest, machines might have a kind of influence and effect on human lives that was not previously present and which could not be presumed either from some Western point of origin or from the existing configuration of local society. Modern, more especially everyday, technologies might create new and unanticipated possibilities—for earning a living, for asserting authority, for enhancing physical and social mobility, for recreation and pleasure.

Technology has the power to reconstitute society but to do so in different ways in different places—the reconstitution of domesticity with the arrival of the sewing-machine or the reframing and revisualization of marriage through photography might be vastly different from their uses and effects in other social spaces and cultural settings—the sewing-machine as a penal tool of work in the

penitentiary, perhaps, or the photograph used to identify a convict or typify a 'criminal tribe'. Technologies might be situated within a kind of corporeal space—technologies of the body, to again echo Foucault. These might be technologies that related directly to the body—from medical instruments such as vaccination needles and stethoscopes to X-ray machines and contraceptive devices, to those whose functions were more cosmetic, about fashion, adornment, and cultural compliance. But, by being represented as having a bodily existence, the machine could itself become embodied with a health and vitality of its own, or it could be seen to require the modern bodies of its subjects to conform to its dictates, to obey its steely governance, or else suffer injury and death.

Technologies might be situated socially, within physical spaces determined by class, gender, and social status. They might be racially sited—within Europeans' homes, on their verandas, within their compounds, at their clubs. But it was often also in the nature of everyday technologies to elide rather than reify racial difference so that the machine might acquire a certain privileged liminality, like the bicycle weaving its way between the native town, the cantonment, and the civil lines, or the sewing-machine moving from the European home to new sites of Indian or Javanese domesticity, eliding in the process any clear distinction between home, workshop, and factory. It is precisely by addressing, as many of these papers do, the spatial location and physical mobility of the machine (and not just the machine in and of itself) that we begin to see, technologically speaking, if not the fragility, then at least the permeability, of the late-colonial and even the post-colonial order. The time and place of the everyday thus helps us to de-centre the state from the histories of South and Southeast Asia and to bring other temporalities and spatialities into prominence.

Speaking temporally, the time of technology might be heterogeneous rather than uniform. As Edgerton has reminded us, in talking of technology it is possible to exaggerate the shock of the new and the rapid passing of the old.[20] Old and new coexisted in home and field, on the streets where motorcars and taxis jostled bullock-carts and rickshaws and even bicycles were perceptually reconstituted as if they were timeless and traditional hazards to mechanized road-users. Colonial regimes might attempt to freeze indigenous technologies,

[20] David Edgerton, *The Shock of the Old: Technology and Global History since 1900* (London: Profile Books, 2006).

turning them into essentialized representatives of an unchanging past, technological relics rather than harbingers of a technological future. Conversely (but also in some contexts complementarily) technological nostalgia for older ways of making and wearing clothes, for preparing food or travelling might be as powerful a force in modern times and modern movements as the wholehearted invocation and enthusiastic endorsement of the modern machine.[21]

It is with issues of this kind that the following papers attempt to grapple. There can be few firm and generalized conclusions but there can begin to be a new consensus around the importance of the everyday in the technological histories of modern South and Southeast Asia.

[21] In this sense techno-modernity might take on different registers and responses in different societies. Influenced by Gandhi and others, the Indian experience of techno-modernity appears very different, for instance, from that described in early twentieth-century Mexico: see Rubén Gallo, *Mexican Modernity: The Avant-Garde and the Technological Revolution* (Cambridge, Massachusetts: MIT Press, 2005).