

car" (p. 210). Furthermore, he adheres to characterizations of China and Asia as passive, sleeping giants: "China, rich in resources, *dozed* while European diplomats and traders smacked their lips" (p. 8); and "Western ideas were shaking long-*subdued* Asia" (p. 32). With respect to Ataturk's limited reformatations in Turkey Blainey writes, "Islam was tamed but not defeated" as though the religion were inherently wild or to be feared (p. 84).

Though I have chosen to focus on the methodological challenges of writing broad histories absent cohesive analytical themes or structures, Blainey's book has taught me some new things about this century and reminded me of some forgotten ones. I was pleased that he included a discussion on the green movement, a relevant gesture to the pressures facing the world today. Despite its shortcomings, this book is useful as a methodological demonstration of the challenges historians face when they try to cover a broad number of complexly interconnected histories in such a small space. All in all, his descriptive narratives are effective in helping readers to visualize certain periods of the century, which should be particularly appealing to a readership in search of a short account of the twentieth century.

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Transforming the Twentieth Century: Technical Innovations and Their Consequences. By VACLAV SMIL. Oxford: Oxford University Press, 2006. 368 pp. \$50.00 (cloth).

Vaclav Smil's *Transforming the Twentieth Century* is an insightful, big-picture history of technological change in the twentieth century. The subtitle of the book, "Technical Innovations and Their Consequences," sums up the author's approach: to identify crucial areas of technological innovation and to explore how they have shaped the broader history of the long twentieth century. Smil is no technological determinist, however. His clear-headed analysis and meticulously collected evidence point to an interplay of social, political, and technological factors that neither relegates technology to the margins nor unreasonably overstates the power of technology, or even people using technology, to drive social change.

In previous works, Smil has argued that technical innovations in the late nineteenth century constituted a major break with the past—a "great saltation" in his terms. In the twentieth century however, he

identifies changes in scale, rather than radical novelty, as the central theme. In a series of chapters covering energy conversion, materials, automation, transport, communication, and information, Smil explores the social, political, and technological factors that informed this dramatic change in scale. Basic innovations of earlier years were elaborated through change in size (whether larger or smaller), proliferation, and the intensity and efficiency of their exploitation. The sum of these changes have, however, had dramatic consequences in Smil's view, as they have "created a civilization that differs in several fundamental ways from previous societies" (p. 254). He stresses growing dependence on interconnected, complex systems that offer constraint as well as convenience; a growing detachment from the physical world; a growth in productivity and the possibility of economic prosperity with an increasingly skewed distribution of that prosperity; and a growth in global thinking that has accompanied both the opportunities and the penalties (such as pollution) of the increases in scale.

Smil's choice of technologies may not all seem equally high profile. Yet the logic of his choices is clearly explained and indeed distinguishes Smil's thoughtful analysis from the genre of popular "greatest inventions" books. By choosing infrastructural and often ignored or taken-for-granted technologies, such as the gas turbine, he shows how they, as much as digital computers and nuclear energy, have become deeply implicated in the very social and political structure of the contemporary world. These technologies may seem common, even dull, on first glance, but it is exactly their ubiquity that makes them worth understanding more fully, as Smil aptly shows. Smil pays close attention to the technological as well as the social and political context of these innovations, exploring the incremental innovations and changing circumstances that are both essential for explaining why certain ways of doing things have become so embedded in our societies.

Because Smil is most interested in changes of scale, much of the evidence he offers to demonstrate the changes of the twentieth century is statistical and graphical, showing increases in production or use of energy, materials, and forms of transportation, for example. He also provides a fair level of technical detail to explain how such changes became possible and, not incidentally, help support his argument about the nature of twentieth-century innovation. He does not neglect the people in the story, although his focus is more on those involved in invention from the side of production and less on those mediators and users who put their own stamp on technological change. The users are visible primarily through the statistics themselves, and as such don't play as large a role in this story as they do in much recent scholarship

in the history of technology. Some may find this approach somewhat dry and detached, especially as compared to detailed studies of smaller scope that can offer a richer, more densely textured engagement with the interplay of technological and social change. This is a familiar trade-off however, between historical scope and detail, and Smil offers a solid justification for his approach and much insight in his analysis. Even those for whom this approach is a departure from their usual reading habits will find much to interest them here.

Readers of this journal may particularly like to know whether Smil's book engages with world history. Smil notes in his introduction that he chose to focus primarily on Europe and North America, and many of his conclusions about the spread or consequences of techniques and artifacts apply primarily to those areas. This book would not be of much help for anyone wanting to understand the interactions of technology and society in Asia, Australia, the Pacific Islands, Africa, or Latin America in any detail. Yet, for all of that, this book is not entirely Euro- or North America-centric either. Certainly, other parts of the world do come into the story when it is appropriate (often in the later twentieth century), including Japan, China, Mexico, Venezuela, and India. Indeed, since the proliferation of technologies is one of his key themes, the geographical shift of technological centers is an important element throughout the book. The familiar story of the gradual move of the international steel industry from the United States to Japan is a good example. Smil may not be writing world history, but he does examine the global implications of technological change, and if he focuses mostly on Europe and North America, he does not assume that their histories are necessarily representative of the rest of the world. So, although I would hesitate to call it world history, Smil's book certainly does have something to offer those interested in getting a global perspective.

Smil's history will be of interest to anyone looking for insight into the complex sociotechnical history of the twentieth century. While historians familiar with technology history will know many of the stories Smil explores, his synthesis stimulates thinking about the big picture in ways that more focused studies can not do. For other scholars, Smil's book offers a helpful view of the interplay of technology and social change during a dynamic era. Smil's work shows one way that technological stories can be integrated into the larger social and political history of the twentieth century; the story he tells makes a powerful case for why it is imperative that we do so.

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