

A Culture of Improvement: Technology and the Western Millennium. By *Robert Friedel*. Cambridge, Mass.: MIT Press, 2007. x + 588 pp. Illustrations, notes, index. Cloth, \$39.95. ISBN: 978-0-262-06262-6.

Reviewed by Steven W. Usselman

Beautifully written and artfully produced, this book surveys technical accomplishments in Europe and the United States since the Middle Ages. Historian Robert Friedel concentrates on practitioners—the craftspeople, architects, farmers, engineers, inventors, and designers who sustained remarkable improvement in so many endeavors across a millennium. He tries to understand these people, to describe clearly and often exquisitely what they did and how they did it, and to convey the satisfaction they derived in the process.

Friedel fills his book with rich portraits of individuals. Each chapter opens with a vignette, and most of them proceed through additional stories centered on principal figures familiar to many historians of technology. Rather than merely lauding the likes of Brunelleschi, Watt, Wedgwood, and Edison, however, Friedel uses them to illustrate broader developments that supported technical practice across time. He paints a series of collective portraits, not a gallery of stars.

While relentlessly focused on practice, the book in many respects reads like an intellectual history. In essence, Friedel seeks to comprehend the evolving mentalité of the Western technical community. His treatments of individuals and of particular technical developments are distinguished by the care with which he illuminates the thought processes involved. When identifying connections among them, Friedel is especially attuned to the changing character of technical knowledge and to the emergence of cultural attitudes that self-consciously embraced and celebrated the pursuit of technical improvement. His account of the Renaissance, for instance, emphasizes the emergence of perspective drawing and compendia of machine designs. Francis Bacon looms large, as do the early encyclopedists and

experimentalists he later inspired. As Friedel moves into the long nineteenth century, which occupies nearly half the book, he groups his material topically around concepts such as mobility, messages, learning, violence, dynamics, and scale. The approach enables him to draw out common intellectual underpinnings of otherwise diverse developments, while also reinforcing his theme of improvement. Throughout the work, Friedel exhibits especially insightful sensitivity to the importance of emergent knowledge regarding the properties of materials. In this and in his broader treatment of the connections between knowledge and practice, Friedel's narrative complements the analysis developed by economic historian Joel Mokyr in his *The Gifts of Athena*.

Business and economics figure in Friedel's account of culture but do not dominate it. Friedel takes pains to distinguish his concept of improvement from the notion of progress that economic historians such as Joel Mokyr and David Landes take as central to their accounts of essentially the same material. While Friedel acknowledges economic incentives and offers numerous insights into the ways they influenced technical practitioners, he considers the drive for improvement a broader and deeper phenomenon that operates through mechanisms other than just the market. The pursuit of improvement stems from broad cultural values, which may encompass a commitment to markets but are never entirely subservient to them. These values, moreover, speak to a complex brew of human emotions. Though his technicians often profit handsomely from their efforts at improvement, seldom in Friedel's telling do they come off essentially as wealth seekers. Their satisfaction derives from deeper sources. Tellingly, the few numbers Friedel provides typically pertain to technical measures of performance rather than economic ones.

For all its range, this work does not offer a truly comprehensive treatment of the place of technology in the history of the West. In concentrating almost exclusively on creative acts and the climate that sustains them, Friedel has not attempted to assess how technologies are deployed and come to insinuate themselves into the fabric of life and the life of nations. This book is not the place to turn for extensive discussions of gender, imperialism, and other questions of power. By choosing to organize the section on the nineteenth century in the fashion he does, moreover, Friedel further detaches technology from the larger narrative of history. Skipping backward and forward in time and shifting from place to place, we lose track of how citizens of a particular place and time experienced technical change. The technique masks the contentiousness that

typically accompanies technical innovation and heightens the sense that technology is experienced largely as improvement (if not progress). Darker chapters entitled “The Corruption of Improvement” (covering the world wars and eugenics) and “Improvement’s End” (on environmentalism and concerns about genetic engineering) make clear that Friedel is far from an unbridled enthusiast. Yet, in reserving such critical notes for his rather rushed treatment of the twentieth century, Friedel reinforces the dubious notion that such skepticism is a new phenomenon that sharply distinguishes recent times from previous historical experience.

These comments should not diminish what Friedel has accomplished. In tracing the practices of a wide range of technologists across a millennium and framing them in an intelligent but accessible manner, he has uncovered a powerful strand of the Western historical experience. Brimming with sound judgments and sensitive insights, this synthesis should hold special appeal for a variety of readers interested in the creative process and the context that supports it. With its comprehensive coverage, the book holds some potential as an undergraduate text, though its dense narrative structure, lengthy paragraphs, and absence of subheadings may discourage some students. These qualities and its idiosyncratic organization will likely keep me from assigning it in my own courses, but I plan to keep it close at hand for years to come when refreshing my lectures.

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