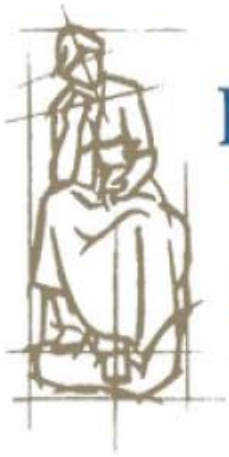
review of Technology, Institutions, and Economic Growth by Richard R. Nelson



lated consumers seek a "sublime" state behind the steering wheel. The chapter on the *Titanic* uses this tragedy as an example of the hidden hubris of technologists. In his chapter on flight, Bailey insists that the history of aviation and aeronautics has a barely hidden spiritual subtext. A chapter on robotics, or "the Pinocchio Project," points to the millennialism dreams rampant in the artificial intelligence and robotics community.

Throughout, Bailey is prescriptive. He bases his position on phenomenologists such as Husserl and Heidegger who rejected the simple subject–object dualism and proposed a return to the notion of Being. He also cites Gregory Bateson, Morris Berman, and other thinkers influenced by environmentalism. Bailey's effort to define "deep technology" overlaps with countercultural and environmentalist critiques of materialism. He strains to avoid pop jargon—rarely, for example, resorting to the word "holistic"—yet urges much the same program. Although he makes vague mention of international organizations and self-imposed ethical codes growing from within the technological communities, his prescription falls into the realm of the therapeutic as he argues that it is up to individuals to see and experience the world in its greater complexity, without the blinders of guiding enchantments.

The Enchantments of Technology is a useful synthesis of philosophy, religious studies, and history. Undergraduate engineering and science students, who might indeed have their eyes opened to the realm of hidden enchantments that Bailey unveils, would be ideal readers.

FRED NADIS

Dr. Nadis is the author of *Wonder Shows: Performing Science, Magic, and Religion in America*, which was reviewed in the July 2006 issue of *Technology and Culture*. He holds a Ph.D. in American studies from the University of Texas at Austin and teaches history at California State University, Channel Islands.

Technology, Institutions, and Economic Growth.

By Richard R. Nelson. Cambridge, Mass.: Harvard University Press, 2005. Pp. 306. $49.95.

What do historians and sociologists of technology have to talk about with economists? What common questions aren't we asking, and what enlightening information aren't we trading? These are not the central questions in the latest book by Richard Nelson, prominent economist and professor of international and public affairs at Columbia University. But they are questions that the readers of *Technology and Culture* should ask, and questions that clearly exercise Nelson much more than most economists.

Nelson's aims are focused within the discipline of economics. He seeks to push back the hegemony of neoclassical theory—and high, formal theory generally—to reintroduce some ingredients historians of technology might find blindingly obvious. As he puts it, "there is an increasing recog-

OCTOBER
2006
VOL. 47

nition among economists that there are entities out there such as universities that do research that feeds into technical advance in industry, and whose teaching programs affect the supply of scientists and engineers; government agencies financing certain kinds of R&D, and others setting standards; banks and banking systems; and a variety of organizations and laws that affect labor supply and demand" (p. 33).

Really? I think Nelson is being facetious, but I also trust that he is serious in his description of economics. Many of *T&C*'s readers may have suspected as much, but it is useful to hear these things from one of the discipline's most important internal critics. *T&C* readers will surely notice that the "entities" Nelson lists are things historians and sociologists of technology have long studied, particularly universities, federal organizations for conducting and funding research, and systems of technological standards. Nelson himself recognizes this, and turns repeatedly to a handful of authors *T&C* readers will recognize—Walter Vincenti, Louis Bucciarelli, Alfred Chandler, Joel Mokyr—to paint in broad strokes a non-neoclassical picture of technological innovation. I could complain that Nelson ignores more relevant historical studies in favor of "big picture" writers, but, plainly, his point is not to delve into history, but to persuade his colleagues to change their ways—by, among other things, thinking more historically and sociologically.

Thus, for non-economists, the book can be hit-or-miss. The chapters are redacted versions of articles Nelson (and his coauthors) have published in economics and policy journals over the past decade. Each one stands on its own, though Nelson elegantly explains how they are connected and what, *in toto*, they build up to. Nevertheless, I suspect *T&C* readers will pick and choose from the menu. Historians of development and/or of the microelectronics industry in Asia, for instance, will find "The Asian Miracle and Modern Growth Theory" a useful introduction to how economists and policy makers talk about technology transfer and economic growth. Likewise, institutional historians and sociologists can use "Making Sense of Institutions as a Factor Shaping Economic Performance" as a dictionary to translate their understandings of technology and organizations into "economics." And epistemologically inclined readers can debate Nelson's discussions of "know-how" and "evolutionary" growth and innovation in chapters 3, 4, and 6.

There are points on which *T&C* readers will demand more of Nelson. I found his disaggregation of "physical" and "social" technologies convenient for bookkeeping but intellectually unconvincing. Likewise, Nelson's description of social constructivism and its challenge to objective measures of technological progress is overly dismissive and strangely at odds with his championing of evolutionary theory as a model. And his evocation of how basic and applied research contribute to innovation and economic growth is vague and somewhat dated—clearly an area where recent historical research could contribute to his theory.

In sum, the book begins and ends well: Nelson's account of growth theory and his disputes with neoclassical economics provide an excellent reference point for historians seeking inroads into economics, and his final chapters championing mixed markets are among the best arguments I have read against the current fever for deregulation, privatization, and market primacy. The book's interior, however, left me dissatisfied, as it may many *T&C* readers. It is a useful kind of dissatisfaction, though, for which we should credit Nelson; he calls attention to (but also sometimes exemplifies) the lack of communication among economists and historians and sociologists of technology. If we are serious about overcoming that gap, this is the kind of book we should be reading.

CYRUS C. M. MODY

Dr. Mody is a sociologist of science and technology studying the commercialization of academic research and the history of nanotechnology for the Center for Contemporary History and Policy at the Chemical Heritage Foundation in Philadelphia.

Resources under Regimes: Technology, Environment, and the State.

By Paul R. Josephson. Cambridge, Mass.: Harvard University Press, 2005. Pp. 269. $39.95.

Resources under Regimes is a provocative meditation on the technological and environmental implications of the modern state. By synthesizing a diverse body of scholarship (including some of his own) into a short, accessible volume, Paul Josephson encourages us to ponder a big question: Why do certain regimes act more responsibly toward the environment than others? Josephson frames his ambitious discussion in terms of three main regime-types: pluralist, authoritarian, and postcolonial. He argues that although all three have damaged the environment, pluralist regimes have done the least harm because they foster the development of legal, scientific, and activist institutions that are responsive to environmental concerns. In short, while pluralist states are strong enough to legislate, regulate, and sponsor environmental research, they are not so strong that they prevent their citizens from mobilizing behind environmental issues. In contrast, authoritarian regimes are so strong that they undermine the development of democratic institutions and thus face less citizen resistance in initiating environmentally destructive megaprojects, while postcolonial regimes are so weak that they are unable to enact effective conservation laws, regulate polluters, or promote adequate scientific research aimed at sustainable development.

Josephson is at his best in contrasting authoritarian and pluralist regimes. Without minimizing the environmental damage wrought by the "geoengineering projects" of pluralist states, he shows that the larger scale and greater momentum of similar projects in the Soviet Union and China have been far more environmentally and socially destructive. While the