Global Transformations

Science and Technology in History. An Approach to Industrial Development. IAN INKSTER. Rutgers University Press, New Brunswick, NJ, 1991. xvi, 391 pp., illus. $50.

Modern advertising has given new meaning to the expression *caveat emptor*. In book titles, as in all forms of advertising, we have learned to be suspicious of broad claims and quick to look to the subtitle or introduction to find the narrow purpose, the case study, concealed within the boastful jacket. What a pleasant surprise it is, then, to discover a book that delivers what its title offers—and then some. Ian Inkster, a professor at the University of New South Wales in Australia, has written a penetrating account of the links among science, technology, and industrial development in the world economy of the 18th and 19th centuries. He has appended to that analytical and descriptive core a brief treatment of 20th-century developments, bringing his book to conclusion in the mid-1980s, before the collapse of the communist states in Eastern Europe and the Soviet Union.

Intending his book for undergraduate and postgraduate students, Inkster works hard to furnish those readers with the introduction they need to the basic concepts and literature bearing on his themes. Along the way, he provides those of us who are no longer students with a great deal of well-ordered information about technological change, its institutional setting, and related power structures, subjects of importance as we try to understand the global economy that emerged from the industrial and organizational transformations of the 19th century. Although the author is a professor of social science and policy, he is in fact a historian dedicated to "the veracity of historical detail, rooted in time and place" (p. xv). As such, he is able to enrich this broad review with the results of his own primary research. This is particularly evident in his treatment of Great Britain, Japan, and the chemical industries worldwide.

What emerges is a historical tapestry with patterns of emphasis and a description of historical process. This is not in the strict sense a theory of development. But in creating his tapestry, Inkster untangles many of the intellectual knots the previous attempts at grand theory have left behind. He does so with good common sense sharpened by an impressive knowledge of the secondary literature in this field. His emphasis throughout is on the flow of information and the private and public institutions that carry the concepts of science and technology into and between economies.

Inkster's major original contribution is, I believe, his treatment of the diffusion of these concepts in Europe and Asia, especially the latter. His comparison of the experiences of Japan, China, and India is most persuasive. In the case of Japan, he finds the ability of the state to promote information flows, to reduce the risks of innovation, and to maintain authority through the transition to rapid growth of central importance. The inability of the government to perform these functions in the case of 19th-century India and China—itself a partial product of empire—doomed those nations to backwardness as the West surged forward toward the age of consumerism.

Specialists will of course be concerned about the lack of depth they find in a book that covers more than two centuries and most of the leading economies of the world. Certainly on my own turf—U.S. economic and business history—I had reason to think the author had given too little credit to the early development of a vibrant commercial sector as a source of industrialization, had failed to recognize how decisively the uniquely rich resource base shaped the nation's transition, and had understated the manner in which entrepreneurship and technical knowledge were blended in many of the relatively small enterprises that were the heart of the economy in the 19th century. In this case, the author uncharacteristically allowed aggregate patterns to obscure those historical details that so enliven his treatment of the European and Asian nations.

While that kind of academic reservation is inevitable given the book's scope, a more serious charge can be levied against Inkster's very favorable view of the emergence of the modern bureaucratic, administrative state. Guided perhaps by a leftish ideology, the author finds much that is good and little that is threatening—either economically or politically—in state planning. This is true whether he is examining German education, Japanese encouragement of technology transfers after 1868, or Chinese resistance to Western technical systems when that country was being sliced up by the industrial powers. In these cases and most others, he sees the state implementing policies suited to the countries' economic environments and technical capabilities. The same is true in his brief review of China's policies since the creation of the People's Republic.

For my part, I have more confidence than Inkster does in markets and more fear than he acknowledges that the state will act in its own behalf, rather than mine (or yours). My views are shaped, I know, by the swing toward deregulation and privatization in the last decade or so and by the dramatic collapse of communism. These events have forced us to appraise more carefully the costs as well as the benefits of bureaucratic planning. They have pressed us to acknowledge that Lord Acton's dictum that power corrupts still applies to even the best-intentioned of modern governments.

That caveat notwithstanding, this is an extremely valuable comparative history of the central processes that created our modern world. Well written if necessarily dense, the book deserves to reach a broader audience than the one for which it was targeted. It can be read with profit by anyone who is interested in the development of the economically significant institutions of science and technology during their formative centuries. If you are not interested in that subject, if you do not care why entire nations led while others followed in the drive to industrial leadership, you should avoid Inkster's *Science and Technology in History*. But in that case you will be forced to fall back on the kind of folklore that all too often substitutes for Inkster's style of hard-minded historical analysis.

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Books Received

Advances in Coal Spectroscopy. Henk L. C. Meuzelaar, Ed. Plenum, New York, 1992. xx, 416 pp., illus. $85. Modern Analytical Chemistry.

Behaviour and Impact of Aphidophaga. László Pólgár *et al.*, Eds. SPB Academic, The Hague, 1991. 350 pp., illus. $92. From a meeting, Gödöllö, Hungary, Sept. 1990.

Calcium Nutriture for Mothers and Children. Reginald C. Tsang and Francis Mimouni, Eds. Raven, New York, 1992. xii, 148 pp., illus. $70. Carnation Nutrition Education Series, vol. 3.

A Case for Case Studies. An Immigrant's Journal. Paul R. Abramson. Sage, Newbury Park, CA, 1992. x, 197 pp., illus. $42; paper, $18.95.

Diluted Magnetic Semiconductors. Mukesh Jain. World Scientific, River Edge, NJ, 1991. xxx, 652 pp., illus. $78.

Endothelial Cell Dysfunctions. Nicolae Simionescu and Maya Simionescu, Eds. Plenum, New York, 1992. xxii, 565 pp., illus. $110.

The Finite Element Method. Basic Concepts and Applications. Darrell W. Pepper and Juan C. Heinrich. Hemisphere (Taylor and Francis), Philadelphia, 1992. xii, 240 pp., illus., + disk. $59. Series in Computational and Physical Processes in Mechanics and Thermal Sciences.

Formal Demography. David P. Smith. Plenum, New York, 1992. xiv, 329 pp., illus. $39.50. Plenum Series on Demographic Methods and Population Analysis.

Genius at Work. Images of Alexander Graham Bell. Dorothy Harley Eber. Nimbus (Chelsea Green), Post Mills, VT, 1991. 192 pp., illus. Paper, $17.95.

Growth and Form. Nonlinear Aspects. M. Ben Amar, P. Pelcé, and P. Tabeling, Eds. Plenum, New York, 1991. xii, 495 pp., illus. $125. NATO Advanced Science Institutes Series B., vol. 276. From an institute, Cargèse, France, July 1990.

Handbook of Differential Equations. Daniel Zwillinger. 2nd ed. Academic Press, San Diego, CA, 1992. xx, 787 pp., illus. $54.95.

Headache and Depression. Serotonin Pathways

as a Common Clue. Giuseppe Nappi *et al.*, Eds. Raven, New York, 1992. xvi, 329 pp., illus. $130.

Industrial Research in the United Kingdom. A Guide to Organizations and Programmes. Longman, Harlow, Essex, UK, 1992 (U.S. distributor, Gale Research, Detroit). x, 543 pp. $255.

Insect Chemical Ecology. Ivan Hrdý, Ed. SPB Academic, The Hague, 1991. xiv, 513 pp., illus. $86. From a conference, Tabor, Czechoslovakia, Aug. 1990.

Landscape with Reptile. Rattlesnakes in an Urban World. Thomas Palmer. Ticknor and Fields, New York, 1992. xii, 340 pp., illus. $19.95.

Light Scattering in Semiconductor Structures and Superlattices. David J. Lockwood and Jeff F. Young, Eds. Plenum, New York, 1991. xii, 603 pp., illus. $135. NATO Advanced Science Institutes Series B, vol. 273. From a workshop, Mont-Tremblant, Quebec, March 1990.

The Mathematical Theory of Non-Uniform Gases. An Account of the Kinetic Theory of Viscosity, Thermal Conduction and Diffusion in Gases. Sydney Chapman and T. G. Cowling. 3rd ed. Cambridge University Press, New York, 1991. xxiv, 422 pp., illus. Paper, $34.95. Cambridge Mathematical Library Series. Reprint, 1970 ed.

The Meaning of Evolution. The Morphological Construction and Ideological Reconstruction of Darwin's Theory. Robert J. Richards. University of Chicago Press, Chicago, IL, 1992. xvi, 205 pp., illus. $19.95. Science and Its Conceptual Foundations.

Nationalism and Internationalism in Science, 1880–1939. Four Studies of the Nobel Population. Elisabeth Crawford. Cambridge University Press, New York, 1992. xii, 157 pp., illus. $44.95.

New Concepts in Global Tectonics. Sankar Chatterjee and Nicholas Hotton III, Eds. Texas Tech University Press, Lubbock, 1992. xii, 449 pp., illus. $65.

Origins of Human Cancer. A Comprehensive Review. Joan Brugge *et al.*, Eds. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1991. xviii, 904 pp., illus. $80. From a meeting, Cold Spring Harbor, NY, 1990.

Origins of the Higher Groups of Tetrapods. Controversy and Consensus. Hans-Peter Schultze and Linda Trueb, Eds. Comstock (Cornell University Press), Ithaca, NY, 1992. xii, 724 pp., illus. $95.

Perspectives on Cognitive Neuroscience. Richard G. Lister and Herbert J. Weingartner, Eds. Oxford University Press, New York, 1991. xvi, 508 pp., illus. $55.

Physical Processes in Solar Flares. Boris V. Somov. Kluwer, Norwell, MA, 1991. viii, 249 pp., illus. $99. Astrophysics and Space Science Library, vol. 172.

Quantum Transport in Semiconductors. David K. Ferry and Carlo Jacoboni, Eds. Plenum, New York, 1992. xxii, 292 pp., illus. $69.50. Physics of Solids and Liquids. Based on a workshop, San Miniato, Italy, March 1987.

Questions About Questions. Inquiries into the Cognitive Bases of Surveys. Judith M. Tanur, Ed. Russell Sage Foundation, New York, 1992. xxii, 306 pp. $34.95.

Regulation of Smooth Muscle Contraction. Robert S. Moreland, Ed. Plenum, New York, 1992. xii, 558 pp., illus. $120. Advances in Experimental Medicine and Biology, vol. 304. From a symposium, Philadelphia, Sept. 1990.

Reproduction, Growth and Development. A. Negro-Vilar and G. Pérez-Palacios, Eds. Raven, New York, 1992. xvi, 440 pp., illus. $130. Serono Symposia Publications, vol. 71. From a meeting, Acapulco, Mexico, 1990.

Schumpeter. A Biography. Richard Swedberg. Princeton University Press, Princeton, NJ, 1992. viii, 293 pp. + plates. $24.95.

The Science of Global Change. The Impact of Human Activities on the Environment. David A. Dunnette and Robert J. O'Brien, Eds. American Chemical Society, Washington, DC, 1992. xii, 498 pp., illus. $99.95. ACS Symposium Series, 483. From a symposium, Washington, DC.

Space-Time of the Bororo of Brazil. Stephen Michael Fabian. University Presses of Florida, Gainesville, 1992. xiv, 253 pp., illus. $39.95.

The Theory of Heat Radiation. Max Planck. Dover, New York, 1992. xvi, 224 pp., illus. Paper, $7.95. Translated from the German edition (1914) by Morton Masius. Reprint, 1959 ed.

To the Ends of the Earth. Women's Search for Education in Medicine. Thomas Neville Bonner. Harvard University Press, Cambridge, MA, 1992. xvi, 232 pp., illus. $34.95.

Ultra-Cold Neutrons. Robert Golub, David J. Richardson, and Steve K. Lamoreaux. Hilger, Philadelphia, 1992 (U.S. distributor, American Institute of Physics, New York). xii, 304 pp., illus. $80.

Uterine and Embryonic Factors in Early Pregnancy. Jerome F. Strauss III and C. Richard Lyttle, Eds. Plenum, New York, 1991. xiv, 291 pp., illus. $75. Reproductive Biology. From a workshop, Bellagio, Italy, Oct. 1990.

Variability of Blazars. Esko Valtaoja and Mauri Valtonen, Eds. Cambridge University Press, New York, 1992. xiv, 465 pp., illus. $59.95. From a conference, Piikkiö, Finland, Jan. 1991.

What is Life? The Physical Aspect of the Living Cell. With *Mind and Matter* and *Autobiographical Sketches*. Erwin Schrödinger. Cambridge University Press, New York, 1992. x, 184 pp., illus. Paper, $9.95. Canto series. Reprint, 1967 ed.

Woody Plant Biotechnology. M. R. Ahuja, Ed. Plenum, New York, 1991. xii, 373 pp., illus. $95. NATO Advanced Science Institute Series A, vol. 210. From a workshop, Placerville, CA, Oct. 1989.

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