

REVIEWS

Johann Peter Murmann. *Knowledge and Competitive Advantage: The Coevolution of Firms, Technology, and National Institutions*. Cambridge, U.K.: Cambridge University Press, 2003. xxi + 294 pp. ISBN 0-521-81329-8, \$60.00 (cloth).

In *Knowledge and Competitive Advantage*, Johann Murmann has laid out an ambitious project, which he clearly intends for business historians to take as a model. Drawing on the rich body of historical material coming from the study of the synthetic dye industry in Great Britain, Germany, and the United States, he proposes a unified theory of the origins and growth of science-based industry as the coevolution of technology, companies, and key knowledge-related institutions. By demonstrating how historical scholarship, systematically applied, can uncover the dynamic processes that transform industries, Murmann hopes to influence three scholarly audiences—economic historians, business historians, and management theorists. Such ambitious projects are bound to have some weaknesses, and this one is no exception, but to an astonishing degree Murmann has achieved his primary objectives.

As his title indicates, Murmann's work focuses on the collective and evolutionary dimensions of the synthetic dye industry as it developed in three different countries. His analysis shows how each nation's university and patent systems contributed to the relative success of the national industrial systems they supported. By emphasizing these particular institutions he offers a new answer to an old question: Why was it that France and England, where synthetic dyes were invented, lost leadership of the dye industry to Germany? According to Murmann, this question cannot be understood by looking only at developments inside individual firms—for example, the institutionalization of R&D. By extending his analysis across national and international levels—tracing relationships among companies, between companies and licensees, and between companies and universities—Murmann offers an important modification to Alfred Chandler's theory of managerial hierarchy, which attributes company success largely to the efforts of individual companies. Murmann contends that the German synthetic dye industry dominated the international marketplace not simply because of German government policies toward intellectual property and university education, but because the synthetic dye companies themselves took an active part

in shaping these institutions in their own interest. Working through associations such as the Association for the Protection of the Interests of the German Chemical Industry, the synthetic dye firms turned their relationships with universities and with the patent system into powerful instruments of collective action. Their British and U.S. counterparts, on the other hand, were hampered by active resistance from such established opponents as the mainstream chemical companies, suppliers to the empire of natural dyes such as indigo, and established industrial preferences for the “practical man” over the university trained one.

For this reader, a weakness of Murmann’s argument lies in his narrow definition of firm success. In light of the welcome emphasis on collective action and a broader national perspective, Murmann’s characterization of individual companies as successes and failures, especially in the formative phases of a knowledge-based industry, seems oddly discordant. Chandler’s account of organizational innovation and managerial hierarchy may indeed admit of only one kind of success story—the giant integrated firm exploiting economies of scale. But Murmann’s acceptance of the Chandlerian definition of success when focusing on knowledge and competitive advantage causes him to dismiss as failures firms that may have both met their own objectives and contributed significantly to the industry’s knowledge base. Family firms like Jager, for instance, might have aimed at profitable novelty rather than scale. Does this constitute failure? As Philip Scranton has pointed out with respect to industrial development in the U.S. during the same era (Philip Scranton, *Endless Novelty*, 1998), avoidance of direct competition and pursuit of niche strategies over decades is a legitimate strategy that both relies on and generates a different kind of knowledge, based on expertise. For such firms secrecy was a valid option, and the amassing of patents a waste of resources, but from a collective perspective their contribution to the growth of an industry might still have been significant. Without access to Murmann’s data one cannot know how many of these anomalous companies existed, but a nuanced account of knowledge and competition would take into consideration a wider range of valid strategic options.

Nevertheless, Murmann’s book all in all is a masterpiece of historical sociology. It achieves both completeness and particularity. He succeeds in clarifying and reconciling bodies of theory—institutional theory, evolutionary theory, national innovation systems—that often do not work well together. Boxed quotations from businessmen, chemists, contemporary historians, and modern historians add both texture and a sense of human agency. The ample bibliography covers both the historical material related to the dye industry and the key

works behind each of the separate bodies of theory. One appendix includes an overview of the synthetic dye industry database developed by Murmann and his research collaborator, Professor Ernst Homburg, which aims to identify all the dye firms and their plants that existed between 1850 and 1914, comparing them at firm, country, and global levels. For business historians, Murmann's work demonstrates the exciting potential of an organized and systematic effort, creatively presented, to make industrial history meaningful to managers, and other historians, without sacrificing richness of detail.

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Gerald W. Brock. *The Second Information Revolution*. Cambridge, Mass.: Harvard University Press, 2004. xiv + 322 pp. ISBN 0-674-01178-3, \$39.95 (cloth).

At a recent hearing in South Dakota, FCC Chairman Michael Powell described teenagers today as the first "digital generation" in history. Between desktops, laptops, cell phones, and mp3 players, they live in an "always on" era with vast quantities of information accessible at the click of a key. For them, information moves effortlessly from device to device, continually shaping an integrated cyberspace that occupies vast landscapes in their minds. For earlier generations, however, cyberspace was only a science fiction dream.

This digital generation's experience is the product of what Gerald Brock calls the Second Information Revolution, a social and economic transformation shaped by the convergence of computing and communications in the second half of the twentieth century. Brock's book, however, is not about the consequences of that revolution. Instead, he provides a remarkable synthesis of the developments in technology and the evolution of institutions that made this revolution possible, a book in line with much of his previous work, *The Telecommunications Industry* (1981) and *Telecommunications Policy for the Information Age* (1998), both published by Harvard University Press.

Framing his analysis within the constructs of institutional economists like Douglass North and Oliver Williamson, Brock argues that new technologies create opportunities for entrepreneurs to lower costs and compete with existing products and services.