

networks. The economic scale is computed by the percentage of information workers in a nation's work force, the contributions of the information sector to the GNP/GDP, and to productivity in the industrial sector. Finally, the social scale is seen as the rate of literacy and the percentage of a nation's school-age population attending tertiary schools. Data are assembled and analyzed for nineteen countries, which are stratified as high-, middle- and low-income nations. By these measures, the authors determined that "in general . . . what was forecast decades ago was confirmed," that there has been significant growth in all three scales in almost all nations, that the richer nations are more advanced and advancing faster than poor nations with undereducated populations, and that the United States and Japan are closest to being information societies, although they fall short of expectations in many ways. None of the generalizations or conclusions will surprise or inform anyone who has been reading the U.S. newspapers over the past ten years.

This book's value lies in the data the authors have assembled. Although the data are sparse and "not easily amenable to either longitudinal analysis within a country or comparative analysis among countries," having the numbers is useful. The book has some merit as an undergraduate textbook, in its broad stroke presentation of global economic changes. It has nothing to say about the application of information technologies in the scientific or academic realms. The authors define and discuss information purely as a commodity (e.g., in numbers of words supplied and in words consumed).

The writing is clumsy and jargon-ridden, and an odd naiveté pervades the book from opening premises to its conclusions. In the second paragraph the authors note without a hint of irony, "Looking for the information society is made more difficult by the enormous amount of data. . . ." In their opening sentences they ask, "Have modern information technology and telecommunications heralded a new society, and a new man and woman? Has the Industrial

Revolution been replaced by the information revolution, with none of the disbenefits of the former?" Is this empty rhetoric or do the authors really expect these things to have happened in thirty years? The authors provide no historical context, no measure by which to assess whether the rate of change they observe is reasonable or expected. They cite no studies or data on normal rates for technology transfer and diffusion to support their conclusions. Most of the data they have assembled and displayed relative to "informatization" is from the 1980s. Yet the authors conclude, "For those who study the theories of information societies in the twenty-first century, it will not be difficult to see the mistakes others have made in the past several decades. The determinists have erred when communication messages were thought to have the effect of a hypodermic needle; they erred when development communication was treated as a panacea to problems in Third World nations; and we believe they are wrong today when information technologies are portrayed as the panacea for equitable world economic growth." The critical and informed reader may find these beliefs and conclusions startling, given the paucity of data, the comparative brevity of the period under study, and the profundity of the restructuring in process.—*Nina W. Matheson, Johns Hopkins University School of Medicine, Baltimore, Maryland.*

Scholarly Communication in an Electronic Environment: Issues for Research Libraries. Ed. by Robert Sidney Martin. Chicago and London: Rare Books and Manuscripts Section, Association of College and Research Libraries, ALA, 1993. 136p. \$28.99, ACRL member price \$24.99 (ISBN 0-8389-7686-7).

On the face of it, the Rare Books and Manuscripts Section (RBMS) of ACRL seems an unlikely organization to sponsor a program on new information technologies. But the proceedings of the section's 1992 preconference amply demonstrate that special collections librarians and historians of the book can bring

invaluable insights to bear upon questions of the long-term research value of e-texts, responsibility for their collection and preservation (intellectual as well as physical), and thorny issues of future access to them. This volume consists of five of the six papers delivered at the plenary sessions of the conference, followed by reactions from a historian, a linguist, and a classicist. (A presentation on legal issues was considered too complex and its subject too fluid to present in an essay comprehensible to lay readers.)

John Budd's keynote essay, "Not What It Used to Be: Scholarly Communication Then and Now," sketches out in quick, broad strokes the history of scholarly communication. Budd argues that the culture of the scholarly community up to now is best analyzed from a structuralist perspective, but that as the electronic environment develops, "we are entering a post-structuralist age of scholarly communication." He points to the malleability of electronic texts and asks, "What becomes of the author if information is lifted, re-formatted, re-used, and absorbed into something different?" As thought-provoking as Budd's arguments are, they do not seem to be echoed in the presentations that follow, although they must have sparked some lively discussions around the coffee urns.

Paul Evan Peters, director of the Coalition for Networked Information, candidly admits his political agenda in "The Coevolution of Networks, Networked Information, and Knowledge Communities." His aim, he says, is to enlist his audience in the network "movement," where they can exercise leadership in addressing five issues: the lack of an artifact in the networked environment; the ahistorical attitudes of most network users; standards of responsible behavior; the evolution of organizational forms and functions (from an archivist's viewpoint); and the concept of "network users" and their approach to information.

A presentation by Elaine Brennan about her experiences in editing HUMANIST and other electronic lists provides a good summary of this medium for those who have not experienced it firsthand. But most list readers will find that it breaks

little new ground for them. Gordon B. Neavill's paper, "Libraries and Texts in the Electronic Environment," in contrast, is a thought-provoking examination of what constitutes text. How should we define "the stock of knowledge" in the electronic context, and how are librarians responsible for its collection and preservation? As a scholar of the American blues tradition, Neavill draws comparisons to the oral tradition, "an extraordinarily robust form of transmission and preservation." The thread of continuity from eighteenth-century Scottish ballads to African-American blues songs is proof that text can survive without libraries, yet it is through Francis James Child's nineteenth-century printed ballad collections that a scholar can trace the connection. Neavill argues persuasively that, while "studies of scholarly communication tend to focus on scholarly publications themselves, . . . the real problems in the electronic environment concern the raw material for scholarly research, especially for humanistic and historical research." It is difficult at this early stage to imagine the most rational and effective means of gathering e-texts for future use. As a possible model Neavill points to perspicacious and indefatigable private collectors who have formed priceless specialized research collections of ephemeral material eventually housed in research libraries: the Thomason seventeenth-century tracts and the Schomburg collection of African-American culture. The librarian's role in such cases has been to accept, organize, and preserve the material, making it accessible to researchers as far into the future as possible.

Peter S. Graham's contribution to the volume, "Intellectual Preservation and the Electronic Environment," is also particularly cogent and valuable. He begins with issues of preserving the medium and long-term access to it, no small matter in the electronic context, and proceeds to the even knottier questions of intellectual preservation. The latter problems arise from the fact that "the ease with which an identical copy can be quickly and flawlessly made is paral-

leed by the ease with which a flawed copy may be undetectably made," either accidentally or maliciously. How can I be sure that what I am reading is what I intended to read or what I read before? Graham explains clearly the potential of three electronic techniques to protect text: encryption, hashing, and time-stamping. He argues forcefully that librarians are uniquely qualified as a professional group to wrestle with the combined issues of authentication, security, and preservation. And to those who would shrink from this task because of the apparent complexity of technologies he rejoins that minds that are capable of using Hinman collators or dealing with corporate authorship are equal to the task!

Due to the illness of another speaker, Graham also delivered his paper several days later at ALA in the Association for Library Collections and Technical Services President's Program. Therefore it has been published in essentially the same form in the proceedings of that program, *After the Electronic Revolution, Will You Be the First to Go?* (1993.)

Some of the chapters in the RBMS volume are based on tape transcripts of the presentations, rather than formal written papers. Unfortunately, the Peters and Brennan transcripts escaped rigorous scrutiny by author and editor—they abound in homonyms and missing words that in some instances merely annoy or amuse, but in others hopelessly obscure the meaning. In the electronic environment it is crucial to remember that spelling checkers do not replace editors!—*Sem C. Sutter, University of Chicago, Chicago, Illinois.*

Heim, Michael. *The Metaphysics of Virtual Reality.* New York: Oxford Univ. Pr., 1993. 175p. \$21 (ISBN 0-19-508178-1).

Our world is being changed by information technologies in ways we cannot claim to understand fully. Exploration of the nature and extent of the changes is a job for philosophers as well as for social scientists and others. Michael Heim is described on this book's dust jacket as being "known internationally as 'the philosopher of cyberspace.'" He has

published a philosophical study of word processing (*Electric Language*, 1987), as well as a translation of Martin Heidegger's *Metaphysical Foundations of Logic* (1984). This collection of essays explores word processing, online searching, hypertext, and computer outliners, and discusses Heidegger's and Marshall McLuhan's views on technology before turning, in the last five chapters, to virtual reality, "the totally inclusive computer simulation." The approach is to try to make connections between the views of philosophers like Plato and Leibniz on the one hand, and questions about the nature and consequences of new information technologies on the other. But the discussions of the philosophers often seem ornamental rather than structural, and the best parts of the book do not rely on a philosophical background. There is, for instance, a lucid and straightforward discussion in Chapter 8, "The Essence of VR," of different facets of, and approaches to, virtual reality, which seems to owe nothing to philosophical ancestors. A discussion in Chapter 7 of life in electronic worlds or cyberspace is of the sort one finds in good popular magazines, and owes more to William Gibson, the cyberpunk author, than to Plato or Leibniz. Where philosophy clearly makes a difference, it is not a very impressive one. Virtual reality is potentially indistinguishable from the real world, Heim says, but it has to be kept not-quite-real "or it will lessen the pull on imagination" and become "bland and mundane." How can it be kept not-quite-real? Alluding to Heideggerian themes of finitude, temporality, and care, Heim goes on to suggest, very briefly, that a virtual world need not "duplicate the deadlines of the real world," that it can offer total safety, unlike the dangerous real world, and that "with the help of intelligent software agents, cares will weigh on us more lightly." (This is the way to avoid becoming "bland and mundane"?) If this is metaphysics, it is definitely a low-calorie, less filling brand. Some of the discussions are seriously misleading; that on Boolean search logic seems not to be clear about the difference