The Soft Edge: A Natural History and Future of the Information Revolution (review)

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The Soft Edge: A Natural History and Future of the Information Revolution.

By Paul Levinson. London and New York: Routledge, 1998. Pp. xvii+257; bibliography, index. $16.99.

Paul Levinson's biological approach to the development of information technology reflects a current social trend to compare machines with natural processes. Recent books such as Douglas Rushkoff's *Media Virus* (New York: Ballantine Books, 1994), George Dyson's *Darwin Among the Machines* (Reading, Mass.: Addison-Wesley, 1997), and Ray Kurzweil's *The Age of Spiritual Machines* (New York: Viking, 1999) all use biological concepts to describe and discuss communication technologies. The notion that there is a relationship between machine processes and evolution is not a new one, however, for this relationship was proposed by computer pioneer Alan Turing in 1948.

Today, computer scientists and communication scholars both tend to use rhetoric that describes DNA as essentially a form of communication and media as a biological process. In a 1984 *Scientific American* article, for instance, Alan Kay wrote: "In biology the message transmitted from generation to generation by DNA is held in the arrangement of the chemical group called nucleotides. Just as there have been many materials (from clay to papyrus to vellum to paper and ink) for storing the marks of writing, so computer hardware has relied on various physical systems for storing its marks." Following this trend, Levinson proposes that we view the development of information technologies from an evolutionary perspective. In *The Soft Edge* he asserts that "all media eventually become more human in their performance—that is, they facilitate communication that is increasingly like the ways humans process information 'naturally,' or prior to the advent of given media" (p. xvi). For example, the voice on the telephone replaces the dots and dashes of the telegraph, and color photography replaces black-and-white images. To argue his theory, Levinson adopts the approach of technological determinism, albeit a "soft" determinism. In addition to being a follower of Marshall McLuhan (Levinson's latest book, *Digital McLuhan* [New York: Routledge, 1999] describes their relationship in detail), he is also an advocate of Karl Popper. Popper's view that we can improve our knowledge through criticism supports Levinson's perspective that an interplay exists between information technology and human choice.

Levinson introduces the concept of "remedial media," that is, that media create unintended consequences requiring the development of corrective media. As a result, media development is essentially a Darwinian process. For example, the personal computer rectifies the inadequacies of handwriting by addressing the "non-interactive shortcomings . . . decried by Socrates, which in turn was a remedial medium relative to the ephemerality of the spoken word" (p. 111). Levinson does note, however, that media are not always invented for the corrective role that they come to play.

To support his arguments, Levinson employs an eclectic range of references, including science fiction (he is president of the Science Fiction Writers of America), historical information, and personal anecdote. In contrast to detailed historical case studies, this book consists of a series of observations about the evolution and future of information technologies. It is written for communication researchers and others interested in examining the impact of media on society. The first chapter introduces general media principles that are historically illustrated in chapters 2–10. Chapters 11–15 discuss five aspects of the information revolution and raise provocative questions about the future of this technology. Of particular interest to Levinson is the future of intellectual property, the amplification of intelligence by technology, and the relationship among intelligence, life, and nonlife.

The Soft Edge is one of a growing number of books that reflect a Kuhnian paradigm shift in our thinking about information technology. By com-

paring machines to biological evolution, the differences between organic and silicon-based systems begin to blur. More importantly, this book raises questions about the nature of intelligence and whether or not future generations will consider inorganic circuitry to be "alive."

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