

The Information: A History, A Theory, A Flood

James Gleick. *The Information: A History, A Theory, A Flood*. New York: Pantheon Books, 2011. 536 pp. \$29.95. Hardcover. ISBN: 9780375423727.

Written for a non-specialist audience, *The Information* is a sprawling, evocative story about how pulses of electricity, the incompleteness of mathematical systems, web pages, and pieces of special protein in cells all came to be called *information*. The Don Quixote of this book is Claude Shannon (1916-2001), an American cryptographer during World War II and long-time thinker at Bell Telephone Laboratories, who noticed that one could discard the content of messages (say, in a telephone call) and make mathematical sense of the flow of information. Gleick artfully intertwines stories about how to transmit messages (beginning with African drum languages and ending with prospects for quantum computing) with explanations of how our thinking about information has changed over time. This is not an academic book focused on setting out a theory of information, although the theory promised in this book's subtitle appears to be Shannon's elegant argument that information is characterized by uncertainty and entropy rather than orderliness and meanings.

Gleick makes demands on his readers. For instance, he spends several pages describing Shannon's statistical argument and conclusion that "paradoxical though it sounded, random messages carry *more* information" than intentional ones (230). Readers are also given renditions of Gödel's incompleteness theorem and quantum computing. Such patience is rewarded by a deepened appreciation of the absolute complexity of attempting, as our profession does, to organize information in helpful ways at all. (Not to mention a greater appreciation of the profound oddness of the universe itself.) Some sections of *The Information* can be read completely on their own and stimulate one's thinking, such as the two chapters (10 and 11) on genes and memes, Richard Dawkins's provocative notion that ideas like "God loves us" or chain letters want to survive as much as spotted owls or polar bears.

Gleick is a polymath who writes elegantly. Of the twenty-first-century information cloud, he says "Forgetting used to be a failing, a waste, a sign of senility. Now it takes some effort. It may be as important as remembering" (407). Of Charles Babbage's nineteenth-century difference engine: "He spent his long life improving it . . . mainly, in his mind. It never came to fruition anywhere else. It thus occupies an extreme and peculiar place in the annals of invention: a failure, and also one of humanity's grandest intellectual achievements" (80). Gleick achieves the wonderful feat of making readers feel that they are present when Alan Turing invents his perfect computing machine (which has even fewer physical manifestations than Babbage's engine) and when Charles H. Bennett argues, Shannon notwithstanding, that messages have logical depth, the Goldilocks point of the correct mixture of randomness and redundancy that creates Charles Ives's string quartet number two or a wedding portrait of my niece Sarah rather than noises in the air or smudges on a piece of paper. Gleick's previous books were nominated for the National Book Award (*Chaos: Making a New Science*, 1987) and the Pulitzer Prize (*Genius: The Life and Science of Richard Feynman*, 1992; *Isaac Newton*, 2003). One sees why.

For librarians, this book is a bracing tonic against the recency effect, the almost amnesiac view that information began with Al Gore's (or DARPA's) invention of the Internet. The Internet itself is mentioned in the book

(although Microsoft is not). Gleick's brief sketch of Wikipedia may simply reinforce one's existing viewpoints on the democratic promise and kudzu-like dark side of the enterprise. Gleick gestures to Lewis Carroll's description of a splendidly accurate map, devised so that one mile of the world is represented by one mile on the map. Some thought this unworkable, fearing that "it would cover the whole country, and shut out the sunlight" (p. 384). Gleick suggests that the encyclopedia threatens to become larger than the world upon which it endlessly comments. It is, he says, as if Jorge Luis Borges's prophecy of a universal library containing all books in all languages is coming to pass. "No knowledge can be discovered there, precisely because all knowledge *is* there, shelved side by side with all falsehood" (373). The flood in *The Information* becomes a torrent as inexpensive cloud storage threatens to overwhelm all potential readers. Thus "the harassed consumer of information" resorts to the two essential coping mechanisms for drinking from the flood: "filter and search" (409).

Gleick weaves many threads in this book and may be forgiven for not adding even more. Readers will not find discussion of the commercial uses of the Internet in this book, despite the fact that the author does detail the links between commerce and accurate tables of logarithms for ship navigation and between commerce and the telegraph. Librarians may wish to read more about filtering, searching, and indexing (or, in another vein, surveillance and shopping). To be sure, readers can pursue these topics elsewhere. As the book stands, *The Information* profoundly stimulates the imagination. I have found myself wondering: is librarianship nowadays at best a form of flood control, or can it aspire to storage, purification, and irrigation?

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