Information Science Versus Science Policy

Albert Henderson

Emboldened by the proliferation of photocopiers and by success in getting "fair use" recognized by the 1976 Copyright Act, U.S. research universities have banked on the potential for technology to reduce library costs. Institutions that spent 6 cents of their dollar on libraries in 1968 now give up less than 3 cents. Through the Association of College and Research Libraries, they have downgraded standards for libraries. Each major research institution has canceled thousands of subscriptions. Partially as a result of cutting library spending, universities' financial operations have never been richer.*

The parsimonious "just in time, not just in case" rationale of the "access, not ownership" gamble has never paid off for researchers and their sponsors. Interlibrary borrowing often takes too long to be useful, and 15 percent of requests are not met. Further, studies of scholarly communication have found few economies from electronics. The brilliance of computers' ability to process data is clouded by their inability to store it forever. The fragility and obsolescence of electronic systems are more obvious than the "brittle paper" syndrome latent in 19th-century innovation, a defect that cost millions of dollars in deacidification and microfilming. Nevertheless, university managers smoothly counter that future archeologists will have "Rosetta stone" tools to interpret JPEG and other compression techniques.

The dogmatic reduction of library spending also tilted the supply of and demand for information. Between 1970 and 1995, spending on major U.S. university libraries grew only 1.6-fold (in constant dollars) while U.S. academic R&D spending rose 2.5-fold. Wordwide, journal articles tripled in number. For every article produced by a U.S. author, two articles are produced elsewhere. Bibliographic databases in biology, mathematics, and physics reflect an average doubling in the number of journal articles every 10 years or so. Other disciplines record 15-year doublings. The economic pressures exerted by the imbalance—research increasing and library markets shrinking—are enormous. Squeeze the open end of a hose while turning the tap to full. The result is spectacular, as in the skyrocketing prices of many journals.

"[U]niversities undermine the quality of authorship..."

Because of this growth, the most profound challenge to modern science is the knowledge gap between contemporaries. Recognized for over 100 years, the challenge turns on a person's limited ability to absorb the massive scattering of potentially relevant information. A logical policy would aim for coherence, a goal that is well beyond the reach of technology. That, in fact, was the first recommendation of a 1963 report by the President's Science Advisory Committee. It read in part, "We shall cope with the information explosion, in the long run, only if some scientists are prepared to commit themselves deeply to the job of sifting, reviewing, and synthesizing information; i.e., to handling information with sophistication and meaning, not merely mechanically. Such scientists must create new science, not just shuffle documents: their activities of reviewing, writing books, criticizing, and synthesizing are as much a part of science as is traditional research."

Publishers, libraries, and meeting organizers have pursued these goals. They channel relevant information to many narrowly specialized audiences, emphasizing service with bibliographies, translations, summaries, comments, and reference material. They prolong peer review with letters and review articles. They add value with wise coverage and by setting standards for presentation, quality, and objectivity. In contrast, the value of a research university must deteriorate with colossal cancellations of science journal subscriptions, the decimation of collections, glib evasions of responsibility for knowledge, and the *sub rosa* priority of financial goals before promised excellence in research and education. By creating a bottleneck, universities undermine the quality of authorship, peer review, instruction, study, and progress itself.

The federal government's objective in investing $15 billion annually in academic research is to produce reliable, useful information about new discoveries. Such information is essential to reducing duplication and error. Present science policy ignores the goals of dissemination (particularly of the research collections used by government-sponsored scientists) and coherence. The burning question is: Why?

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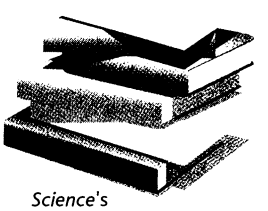
*See Tables 1 and 2 and the graph at www.sciencemag.org/feature/data/1051760.shl



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