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Information Transfer: The Biomedical Model

"Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it." In 1775, when Samuel Johnson wrote these words, there existed men of science who could claim to possess knowledge in their disciplines that was both broad and deep. Today, even with the fractionation of science, it would be a presumptuous scientist who claimed to know everything in his specialty. What is true for scientists is true also for librarians; to paraphrase the great doctor: scientific literature is of two kinds—we have the information ourselves, or we know where to borrow it.

The problem of information transfer in contemporary science is exacerbated by two trends. First is the geometric increase in published knowledge in all branches of science and technology. Second, as inexorable as the first but more pernicious, is the rapidly rising cost of books and journals. Many libraries are not able to keep pace. The net result of both trends has been a decrease in the proportion of the total scientific record held by each library.

Steps to cope with this dilemma are already being taken by libraries and information centers. The solution is a long-term one and has two elements: improving our ability to search the aggregate record of what has been published and *identify* pertinent materials, and improving our ability to then *retrieve* the books and journal articles themselves.

For the first of these two elements the key is computerized on-line bibliographic retrieval. In the area of biomedicine it has been demonstrated that a large and growing body of literature, both periodical and monographic, can be indexed, entered into a central computer, and searched economically in real time from computer terminals in more than 900 institutions across the United States. The experience gained from operating this system—called MEDLINE—should have wide application in other scientific fields.

Today's health professional has an array of bibliographic data bases available for instantaneous searching over the MEDLINE network: journal articles, monographs, audiovisual materials, toxicology and environmental health data, chemical information, health planning and management literature, cancer research information, and so forth. The number of references and abstracts in these combined data bases is now approaching 4 million. More than 1 million on-line searches are being performed each year.

The second element—retrieving the actual book or article—depends not so much on computers (although they have their place) as on sharing resources. As the increasing volume of scientific literature strains the capacity of shelves and budgets, science librarians rely more and more on cooperation to provide for the needs of their users. In many instances local and regional consortia have been formed. Union catalogs and lists of periodicals allow an information center of modest size to provide access to what would be an extensive collection if it were housed in one institution.

In this area also, the health sciences have assumed a leading role. A network of biomedical libraries, ranging from local community hospitals to 11 regional medical libraries to the National Library of Medicine, ensures that a document, no matter where it is located, is available to any other member of the network. Within the network, more consortia of health science libraries are being encouraged. Members of consortia not only share their books and journals but arrange cooperative on-line search services and training—activities that individually they are too small to engage in but that collectively they find feasible.

The information services pioneered by biomedical libraries may provide a useful pattern for improving communication in other fields of science. There are problems yet to be overcome, but experience indicates that the basic approach of computerized bibliographic access with concomitant library resource sharing is sound.—MARTIN M. CUMMINGS, *National Library of Medicine, National Institutes of Health, Bethesda, Maryland 20014*