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Coping with the Information Explosion

There is divergent opinion concerning the seriousness of the information explosion. Many research workers minimize the importance of the problem. Established investigators find that most of their needs for information are met through participation in invisible colleges and scanning of the relatively few journals in which material of interest to them usually appears. Instead of spending time on more or less fruitless search among a vast number of journals, they gamble that their proposed research will not closely duplicate existing work. Usually their judgment is correct.

On the other hand, some administrators believe that we are failing to utilize much of the vast amount of information available in 50,000 scientific journals. Some politicians seem to have an almost pathologic fear that research may be unwittingly duplicated. As a result, they have been willing to support all kinds of attempts to make scientific and technical information more readily available. Currently the federal government annually devotes \$250 million to such efforts. This sum substantially exceeds the funds allocated for all research project grants supported by the National Science Foundation.

In spite of the divergence of opinions concerning the information explosion, scientists and politicians agree that quick, selective information retrieval and dissemination are desirable. Progress toward these goals is being made by scores of organizations. One of the most interesting approaches has been made by a commercial concern, the Institute for Scientific Information, of Philadelphia. The Institute has, on magnetic computer tape, comprehensive information concerning current scientific periodicals, and it has devised effective means of using this resource. The coverage includes more than 1500 of the world's leading scientific journals, which in a year print more than 300,000 articles and perhaps over 90 percent of those reporting significant advances. The information concerning each article includes title, author or authors, and literature cited. Associated with the 300,000 articles are more than 3.3 million citations, 576,000 authors, and titles containing 2.1 million words. Altogether there are almost 10 million stored index items pertaining to the articles. A particularly useful tool in a search for significant articles in a particular field is the Citation Index. Authors usually cite literature that they feel is particularly relevant to their work. To learn what is new in a field one merely asks the computer for a list of published items that contain citations to previous important articles in that field. The computer can also be asked to supply a list of articles written by authors known to be active in a given area. Words or combinations of words in the title can also serve to identify items of interest.

A complete Citation Index, available quarterly, is bulky and contains more material than the average scientist wants. The Institute has a service much better designed to meet the needs of individuals. It is called Automatic Subject Citation Alert (ASCA). This service provides a weekly list of articles that have appeared in any of the 1500 scientific journals and that meet citation, author, or other indexing criteria that the user has provided.

An interesting by-product of the Citation Index is a new method of evaluating scientific productivity. Instead of counting a man's reprints, one counts citations of his work by others. Already sociologists are examining the value of this new analytical tool. They note some limitations but find that a citation index is a valuable aid to management.

—PHILIP H. ABELSON