

Battelle and Technical Information*

By IVER IGELSRUD

Battelle Memorial Institute, Columbus, Ohio

Received September 1, 1961

This symposium is an attempt to describe the information cycle in an organization in perspective from producer to processor to user. There have been many papers that described the information processing operation alone, including abstracting, indexing, filing, *etc.*, but none that describe the input, the processing, the use of the facility by the scientist, how the facility helps him, and what are the specific benefits.

The symposium is really a report on some ten years of very active work with technical information at Battelle Memorial Institute. During this period, we have operated, for special purposes, information centers ranging from those covering a single metal such as titanium to centers covering the whole range of the physical, chemical, and engineering sciences with some sizable excursions into the biological area. Library services are of course a part of such centers.

In order to carry out their obligations Battelle's centers must put the information gathered and processed into immediately useful products such as technical service, state-of-the-art reports, research reports, research programs, and the like. This makes Battelle's centers somewhat different from many others. There have been involved over the years hundreds of engineers and scientists both within and without Battelle in addition to information specialists, librarians, and clerical help. The symposium, therefore, is devoted not just to documentation or information processing. Documentation, or information processing, by itself is meaningless unless it is tied into the larger scientific endeavor of which it is only a part. It is a part of a cycle which includes the production and the use of information. The most important part of this cycle to us at Battelle is the user and his role. We are therefore reporting about user-oriented information services.

Battelle's relationship to the technical information problem goes back to Battelle's founding. Battelle is a research institution whose charter assigns it the task, among other things, of "encouragement of research . . . , and the making of discoveries and inventions." Gordon Battelle, the last scion of a pioneer American family was led by his metallurgical interests into research. He was so inspired by his experience that he decided to found an institute to do research for industry. Battelle opened its door in October, 1929.

Dr. Horace Gillett, who was Chief of the Metallurgy Division of the National Bureau of Standards, became Battelle's first director. Gillett cut his teeth on research in Thomas Edison's laboratories in 1906. Twenty-three years later he brought to Battelle his knowledge and understanding of the needs for research and for communication among scientists and engineers.

As might be expected, Battelle's research in its early

years was largely in metallurgy and the physics and chemistry of ceramic materials and fuels. Beginning an accelerated pace later in the 1930's, Battelle's research has spread into almost all of the sciences and technologies. In 1961 Battelle finds itself with a staff of nearly 2500 in Columbus, and about 1000 at two laboratories in Europe and doing contract research work at a rate over \$25,000,000 per year in virtually every field of science and technology.

An average growth in research of over three quarters of a million dollars per year is not made without communicational and educational pains. Perhaps Gillett foresaw some of this when he became director of Battelle. One of his first acts was to donate his personal technical library to Battelle's research staff of about 30 people. His example inspired several others of the staff to do the same. These books and magazines served as the nucleus of the present Battelle library of over 70,000 volumes.

Gillett was a great believer in keeping well read in one's profession. He was his own best exponent of this. Most of his friends and intimates will attest to his omnivorousness when it came to metallurgical knowledge. Along with this omnivorousness he had the faculty of casting out the trivial and the chaff. He was able to instill in his colleagues not only his insatiable curiosity about science but his philosophy of the desirability for selecting the valuable and letting the rest go.

In order to help stay well read he became editorial director of the magazine *Metals and Alloys* simultaneously with becoming director of Battelle. He induced a number of Battelle staff members to become well read with him by abstracting the metallurgical literature for *Metals and Alloys*. He devised a form of abstracting called correlated abstracts. Each of these abstracts was a miniature state-of-the-art report as the art was reflected in the current literature. Many of these miniature state-of-the-art reports were prepared by each Battelle participant during any given year.

Simultaneously he established information files. References marked by him and his abstracters were clipped, pasted on cards, and interfiled with abstracts from many other sources. These fixed references were used in daily work and as sources for quick briefing when unfamiliar research tasks faced the staff.

But Gillett realized that reading about the other fellow's research was not enough. Contact with other researchers, so that work in progress and new ideas could be discussed, was also necessary. Attendance at technical meetings, participation on technical committees, presentation and publication of papers, participation in symposia, participation in report writing seminars, all were encouraged and expected. Gillett set his own example because he did all these things too.

His dedication to growth of the technical man through education on the job was shown by his asking to be relieved of the administrative duties of the directorship

* Presented before the Division of Chemical Literature, ACS National Meeting, St. Louis, Mo., March, 1961.

so that he could attend more directly to technical quality of Battelle research and to development of the Battelle staff. Significantly he did not resign his editorship.

This history illustrates some of the needs that research people have which must be fully taken into account in any documentation plans that are made. It makes a point that is very often overlooked in our zeal for devising clever plans for searching the literature.

The literature is only one of the sources of information for the scientist. Of equal, if not greater importance, is his contact with other scientists. This is particularly true where there is urgency on tasks where things progress with great speed. Sometimes there is hardly time to get things recorded in laboratory notebooks or even on automatic tapes, let alone in reports and in published papers. Personal contacts may not only obviate many pages of reading but furnish new information and data. Sometimes personal contact will reduce the importance of literature to zero.

Where personal contact is not possible, the literature, which consisted originally of personal correspondence, is all important. It is the scientist's substitute for personal contact. There is a real fear among many scientists that the documentalist may in some way deprive him of intimate contact with the literature. He fears that the literature will disappear into bottomless files or electronic memories and he will not be able to reestablish contact with it and more importantly with its authors. Whether or not there are any grounds for this fear is beside the point. Such contact is vital to him. We must insure that it is maintained.

In spite of the fact that he fears that the documentalist may go too far, the scientist needs retrieval schemes for searching the literature. But they must not deprive him of direct access. He also prefers to have the literature organized to suit his particular needs of the moment. He much prefers that someone else's organizational scheme not get in his way. Because the scientist's time is one of our most expensive commodities this point deserves remembering. We need to make possible custom use of the information without interfering with the scientist's other custom needs.

Because of the variety and the size of the informational activities undertaken by Battelle, there is naturally keen interest in research on better and faster communication between the user and the literature. It has been necessary to become familiar with all of the various techniques proposed for disseminating, storing, and retrieving information and data. We have carefully searched out and studied available electronic and mechanical as well as manual means for indexing, storing, and retrieving. Techniques which seemed helpful have been adopted. For the most part it has been necessary to develop the necessary techniques. Experience has shown that the best communication techniques are those that least fetter the imagination and freedom of action of the scientist. Preferably such techniques should not only supply him with guide lines for action but should stimulate his imagination. Techniques which do this and also give him

fast access have been generally found to be quite simple.

For the scientist it is not enough to provide a filing scheme, a library, or an information center. He is not likely to use it or to learn its rules of operation with enthusiasm. Scientists, who after all are the ones who have to solve problems, generally want to do their own searching, in their own way, and in their own time. This is also a real need for them.

At Battelle instead of merely providing a center for the scientist and waiting for him to come to use it, he is taken into the operation and made the king pin as he should be. The advantage of the scientist as the hub of the information activity with responsibility for guidance in selection, organization, and dissemination is an advantage that is usually overlooked. His absence from this spot lies at the root of much of the information retrieval problem.

Battelle is active in two aspects of the information problem. One is the aspect which we call information research. This is research directed at better communication between scientists. It includes but is not restricted to research in the information and data retrieval. Information research is little understood because its roots lie much deeper than is commonly understood. Sadly, most documentation research is research in manipulation and classification with little understanding of the user. It is hoped that we can probe more deeply here than has been done.

The other information activity Battelle engages in is the so-called operation of information centers. For example, many of you have no doubt heard of or had contact with the Titanium Metallurgical Laboratory, the Defense Metals Information Center, the Radiation Effects Information Center, the Cobalt Information Center, and so on.

The term information center in most of these instances is misleading because it may give a false impression of what they are. Actually they are projects whose assigned task is to make scientific and engineering studies and evaluations of current data and information.

The information centers are all very highly user-oriented. They are user-oriented because they are focused on the solution to well defined problems which their users are attempting to solve. The focus on the solution of a given problem makes it easier with confidence to identify and select information and data which is or is not pertinent.

Focusing on the problem and the user instead of on the mass of literature allows the information process for the scientist to be broken down into (1) identification, (2) selection or screening, (3) integration, (4) dissemination. Identification has to do with judgments on pertinence and selection with judgments on how pertinent. Integration has to do with judgment in the use of the built-in recall mechanisms or integrating factors found in all literature. Dissemination has to do with judgments in synthesis and distribution of knowledge.

With these concepts in mind, storage and retrieval are reduced to rather simple operations. The story of this is developed in the following four papers.