

company announced that the system was in full commercial operation in May, and a testing phase begun last autumn made the system available at the *Times*, a visitor gains the impression that many staff members are still getting acquainted with the new technology. One observer involved in information-bank operations generalized that "most people are not using it on a continual basis. Some jumped at it and use it all the time. Some we haven't been able to drag to a terminal."

The system takes some getting used to. The computer language of the system is English, and rational discourse with the computer can be carried on by someone who is not a computer expert, but finding the right entry terms can be frustrating, particularly if time is a factor. The problem is mitigated for reporters by the presence in the newsroom of a half-dozen researchers now familiar with the system whom reporters can ask to "run" an inquiry for them.

This reporter found no Luddites on the subject of the data bank. One reporter, who perhaps is a typical user at this point, said he calls on the system almost exclusively for the retrieval of specific factual information—middle initials, dates, numerical data. He says he finds the system helpful and not difficult to use. His major negative comment was that he misses the element of serendipity which was a potential dividend in using clippings from the morgue. Often a reference in a clipping that seems only remotely related by strict indexing criteria, or that might even be in the envelope by mistake, leads a reporter to something worthwhile. A member of the IBM group who worked on the *Times* system acknowledged that this point had been raised right from the start and observed wryly, "Maybe we shouldn't have debugged it so thoroughly" (meant in the pre-Watergate sense of getting the bugs, or extraneous material, out of the system).

Outside subscribers to the information bank have the option of several classes of service, with costs varying according to hours of availability and terms of access. Unlimited access through all the hours of operation costs \$1350 a month. The system now operates from 8 a.m. to early evening, but plans are to extend the hour of shutdown to the early hours of the morning, when the *Times* has its final deadline. At the other end of the cost scale is 8 a.m. to 1 p.m. service, Mon-

day through Friday, which costs \$675 a month. The basic contract does not include the cost of hardware used by the subscriber.

The information bank now has about 15 customers, including media subscribers such as the Associated Press, *Detroit Free Press*, and NBC, plus government agencies, the United Nations, corporations, and financial institutions.

The *Times* is not very forthcoming on what the costs of the system are, and it is true that it is difficult to decide where some costs should be assigned—for instance, indexing/abstracting, which was already a major budget item. The *Times* did say in announcing the commercial service that the development of the system had cost some \$3 million.

In respect to the state of the computer art, the *Times* system is not deemed to be at the forefront of technology. But in terms of capabilities it surpasses most big systems. The MEDLINE system operated by the National Library of Medicine (*Science*, 23 July) is an impressive on-line system but is limited to responding to inquiries with standard citations of scientific literature.

The security arrangements built into the *Times* system are apparently fairly standard ones. There are identification numbers and, in some cases, "passwords" to ensure that only authorized users get access to the bank. And there are other protective controls such as those for outside customers who don't wish others to know what inquiries they have run. Again, human judgment plays a role, since there is a staff member on hand whenever the system is operating to act as a monitor and decide the issue if rights of access are questioned.

In developing the system, the *Times* and IBM rejected most of the fancier options on the frontier of computer applications. Ruled out, for example, was machine scanning, which would have provided for electronic indexing through machine recognition of key subject words and phrases in articles. On the other hand, the system is carefully designed so that it can be extended. There is some consideration, it seems, of creating subsidiary information banks in specialized areas such as science and business.

While the *Times* is pioneering with information bank, it is hardly a leader in other computer applications. On the production side, the *Los Angeles Times* and several other, smaller papers have taken a lead, and on the editorial side

both the Associated Press and United Press International are far advanced in using computer technology in speeding the process by which news is written, edited, and transmitted. The *Times* has faced particularly tough resistance from craft unions on automation of the production process, and *Times* management, now in a delicate phase of labor negotiations, is being tight-lipped on the subject of technology. But the *Times*, like other publications, has been led by economic necessity and technological opportunities to regard itself as in the information business and to seek to approach the packing-house ideal of using everything but the squeal.—JOHN WALSH

RECENT DEATHS

Herbert J. Bartelstone, 50; professor of pharmacology, College of Physicians and Surgeons, Columbia University; 11 May.

Egon Bretscher, 71; retired head, nuclear physics division, Atomic Energy Research Establishment, United Kingdom; 16 April.

Thomas B. Cameron, 56; professor of chemistry, University of Cincinnati; 2 March.

Edward S. Castle, 69; professor emeritus of physiology, Harvard University; 19 May.

Frank L. Chan, 67; retired research chemist, Aerospace Research Laboratory, Wright-Patterson Air Force Base; 8 October.

Emile Despres, 63; professor of economics, Stanford University; 20 April.

Sidney Farber, 69; former president and scientific director, The Children's Cancer Research Foundation; 30 March.

Paul W. Gast, 43; professor of geology, Columbia University; 16 May.

Francis R. O'Brien, 61; associate professor of mechanical engineering, University of North Dakota; 12 May.

Ivan Pratt, 64; former professor of zoology, Oregon State University; 14 April.

Eugene Rabinowitch, 71; former professor of chemistry, State University of New York, Albany; 15 May.

Zdenek Sekera, 67; professor of meteorology, University of California, Los Angeles; 1 January.

H. T. U. Smith, 63; former head, geology and geography department, University of Massachusetts; 22 February.