Library Participation in a Biomedical Communication and Information Network*

BY WILLIS E. BRIDEGAM, JR., Librarian
Edward G. Miner Library
University of Rochester
Rochester, New York

ERICH MEYERHOFF, Librarian
Health Sciences Library
State University of New York at Buffalo
Buffalo, New York

ABSTRACT
The experience of two libraries participating in the SUNY Biomedical Communication Network is described. The history of the Network is briefly given, together with its original aims and their current status. Use of the terminals and formulation of queries are explained. Figures are given for total costs, number of searches performed, and cost per search. There is an account of the internal structure of the administration of the Network.

THE Biomedical Communication Network of the State University of New York directed by Irwin Pizer represents, in our judgment, a qualitatively new departure in interlibrary communication and information access. The nearly instantaneous contact with geographically distant stations, the easy and direct access to human beings miles removed creates a sociopsychological environment which transforms an impersonal array of institutions into a close, audible community. (See Fig. 1.) We are approaching the face-to-face relationships generally acknowledged to be essential for effective communication in library activities concerned with the transfer of information. The use of remote typewriter terminals as a means to a direct man-machine relationship also represents an entirely new setting for the user seeking bibliographic information. We are in a new world and past experience may prove quite misleading in finding our way and evaluating the effectiveness of new modes of operation. The experiences of only two libraries, the Edward G. Miner Library of the University of Rochester and the Health Sciences Library of the State University of New York at Buffalo are the basis of our observations.

It is not necessary to trace the history of the SUNY Biomedical Communication Network in detail, as this has partly been done (1), but it is useful to place it in the historical context of the ideas and movements in the library world at the time of its conception in 1965 and to examine to what extent the early notions were retained in its present operation.

ORIGINS OF THE SUNY BIOMEDICAL COMMUNICATION NETWORK
In 1965 the State University of New York became one of the founding institutions of the Interuniversity Communications Council (Educom), whose aim was to revolutionize higher education by use of computers for dissemination and storage of information, as learning machines and as parts of a nationwide educational computer network. Educom still exists. It publishes a house organ and has organized a few workshop conferences. At the State University of New York, however, these ideas took firmer roots and in March 1965 an Intrauni-
WILLIS E. BRIDEGAM AND ERICH MEYERHOFF

After I took this volume of the shelf it fell down the lift (elevator for books and is now sitting at the bottom. It may take a day or so to retrieve, but you will get your request shortly. Sorry to make so much trouble.

MESSAGE 1553128-10 IN TRANSMIT QUEUE.

send 07

MESSAGE 1554311-10 IN TRANSMIT QUEUE.

Send 10

EXCUSE ME FOR LAUGHING.

SEND =

EXCUSE ME FOR LAUGHING.

send 02

IMPROPER USE OF EOT. LAST MESSAGE DELETED.

say, your message didn't come in right, and all we got was 'excuse me for laughing.'

would you mind repeating it (our terminal was locked in upper case, and it got messed up)

Fig. 1.—Example of Network Dialogue and a Computer Scramble
LIBRARY PARTICIPATION IN A BIOMEDICAL NETWORK

University Communications Committee (Intracom) was established to spark a university-wide program in which all major units of the university were represented. The task forces were planned.

1. Linguistic functions of computer
2. Medical libraries
3. Shared library facilities

What is important to remember in view of later developments is that the concern was originally university-wide and that a representative university-wide political mechanism was created to decide relevant issues. The only survivor of the original structure is the Biomedical Communication Network.

This was due to a confluence of unusual circumstances. The Vice-President for Health Affairs at SUNY at Buffalo, Peter H. Regan III, was not only interested in computer applications to medical libraries but had sufficient drive to persuade the Bureau of the Budget of the State of New York to support the project and obtained funding from the Legislature. Irwin Pizer, Librarian of the Upstate Medical Center, had just participated in wide experimentation in the application of computers to technical processes in a medium-sized medical library at Washington University in St. Louis. Both Pizer and Regan were able to persuade the President of the State University of New York to try a pilot project which estimated to reach a steady cost level of $600,000 in 1969–70 (2).

In July 1965, the Task Force on Medical Libraries began to function. A month later, on August 17, 1965, Irwin Pizer was elected chairman of this group. He already had begun to prepare a Union List of Serials for the entire State University and he proposed a computer system with remote terminals to be used for bibliographic searching and interlibrary communication. The participating medical libraries were conceived as a network which might become a MEDLARS search center serving other medical schools in upper New York, Pennsylvania, and Ohio. On August 24, the National Library of Medicine was approached. On September 23, 1965, he had drafted a program for "A Computerized Bio-Medical Information Resource". The final document of January 11, 1966, does not differ in essentials from the first draft, although revisions were made. The equipment budget stipulates an IBM 360/40 computer. Specifications were developed later and eight companies were asked to make proposals. Only IBM submitted a complete and detailed proposal and was the successful bidder. It also assigned a full-time systems engineer, Mr. James Dorr, to the project in 1966 (3).

The proposed functions of the Network have been described by Pizer in a number of publications (4, 5).

A list of objectives of the Biomedical Communications Network follows with indication of their present status.

1. A computerized catalog of textbooks and monographs of a consortium of libraries. In-depth indexing, i.e. chapter by chapter subject analysis and assignment of as many subject headings as necessary to describe the content of book.

YES—Achieved for the file of the Upstate Medical Center. Books unique to the other State Medical Libraries have not been indexed in depth.

2. Union lists of serials and books with options for printouts of holdings of specific libraries.

YES—This capability exists, but production of lists for individual library is not yet a matter of routine.

YES—This capability exists, but has not been instituted.

4. Lists of journals currently received arranged in accordance with various options.

YES—Possible but not routine; only Upstate has produced a list.


YES—For 1966 through 1969; no off line searches.

6. A current catalog, the combined book catalogs of the consortium in a real-time, on-line system, direct computer-user relationship.

YES—Current Catalog; the books from Upstate and Buffalo are complete, with Downstate and Rochester partially represented.

7. Current awareness services and selective dissemination services.

YES—Through 2740 terminals at each library; Rochester has begun an experimental SDI service.

8. Recurring bibliographies.
9. Automatic interlibrary loan requests when the journal or book is not in the library in which the user is located.
10. Direct interlibrary communication for interlibrary loan requests, administrative messages, etc.
11. Education and training of library personnel.
12. Research and development of techniques of information storage retrieval.
13. Production of MeSH subject heading guide cards.
   Central computerized circulation records and notifications.
   Central computerized serial records.

Some of the basic elements of the Biomedical Communication Network were in the process of development in other medical libraries in 1965. They were a part of the ideas which were current in medical librarianship in the middle sixties. Although important contributions came from many sources, the Biomedical Communication Network was able to translate into operational reality projects which remained in the trial stage elsewhere. For example, a real-time, on-line computer-stored catalog of the books and monographs, with in-depth indexing, catalog card production, and remote access terminals was an inherent part of the Columbia Harvard Yale Medical Catalog Project. It is no longer in existence. (The cataloging and coding routines still survive in a changed form at the Yale Medical Library but have been abandoned by the other participants.) The Biomedical Communication Network achieved many of these objectives including the remote access to a computer-stored catalog of many libraries.

The computer-mediated retrieval of Index Medicus citations and the decentralization of search capabilities of MEDLARS tapes had medical institutions literally scramble to become MEDLARS centers. In order to widen access to MEDLARS tapes, the National Library of Medicine approached the University of California at Los Angeles to develop computer programs to make searches of MEDLARS tapes possible by computers other than the Honeywell 800. UCLA produced programs for use with the IBM 7094/40 which were operational, but could not be used at UCLA because its 7094/40 was transferred. Harvard also received a contract to achieve a similar mission. UCLA’s and Harvard’s programs were made available to a group at Ohio State University. This group set out to produce independently programs currently in use for the search of MEDLARS tapes on IBM 360/40 computers. The Biomedical Communication Network also developed programs currently in use. Random access and disc storage had been accepted as essential in the new MEDLARS program. The Biomedical Communication Network provides a decentralized, instant search capability for Index Medicus citations and additionally for information in the Current Catalog. Lastly, the Network produced a computer-based Union List of Serials as did the Medical Library Center of New York with many customized options.

Great drive, ingenuity, firm development support from IBM, and a commitment of funds by the State of New York produced results which had eluded others. Certainly one of the major achievements is the direct search of the information contained on MEDLARS tapes. How the medical personnel encounters this will be our next consideration.

Orientation and Terminal Use

Orientation for the user of the IBM 2740 terminal can be accomplished in several ways. By typing “seek”, the user can request instructions in performing a literature search on the terminal. Since having to wait nine minutes for the printout is too time-consuming for most doctors, photocopies of the “seek” printout are usually provided. John Theall, Resident Technical Specialist for the SUNY Biomedical Communication Network, has compiled a short guide to literature searching in the Network covering not only search strategy, but also instruction in mechanical operation of the terminal (6). If the user has the patience and inclination to read about Network literature searching first, this approach will suffice, but more likely he will immediately request private
LIBRARY PARTICIPATION IN A BIOMEDICAL NETWORK

instruction from one of the librarians. It is in these time-consuming but effective sessions that most users learn how to perform literature searches.

Before entering a search on the terminal, the user must select appropriate subject headings from the MeSH list and a Check List of additional headings. The Index Medicus Categorized Lists should be consulted for additional or more specific headings. If there are two or more headings, they must be placed in an "and" or "or" relationship. Subjects may also be negated. This is the chief stumbling block for most users since they have difficulty understanding that terms entered in the same group are in an "or" relationship and not necessarily related, while terms entered in separate groups are in an "and" relationship and must both be acknowledged in the retrieved articles. Subheadings should be considered and chosen from the standard MeSH list, using only those subheadings that legally apply to the selected subject headings. The inherent limitations of the indexing and the contents of the data base must be carefully explained in advance in order to avoid giving the user false expectations. The researcher might find that his needs are too specific for a search. If he compromises and uses more generic terms, his bibliography may lack relevance, especially in the book citations retrieved. The person interested in paramedical subjects might be disappointed since the service is oriented primarily to medicine. Having taken these preliminary steps, the user is finally ready to use the terminal.

Correct spelling and accurate typing are essential since the computer is at present able to recognize only the MeSH or Check List terms. A program to permit the use of common misspellings, synonyms, and variant forms of words is being developed but is not yet operational. Occasionally the computer "goes down" in the middle of a search formulation or printout. Service is usually restored soon, but the search request or message may be lost, requiring the user to start over.

If the search has been carefully formulated, the printout will usually satisfy the requestor. He will also be delighted to learn that it is his property. In most cases he is interested mainly in the periodical citations, and particularly the more recent articles. Although the total number of pertinent citations is indicated, the printout is limited to the ten most recent journal and book citations for obvious reasons. If the complete bibliography is requested, it must be produced by entering the same search in an abbreviated form over and over until all citations have been typed. Off-line searching with mail delivery of the results has been promised as a solution to this problem.

Despite the fact that a person has read and reread instructions of machine searching and received a half-hour orientation, it is the exceptional user who will not require the assistance of a librarian for at least his next five or six searches. Providing this assistance and other related services greatly increases the staff requirements of the library. A well-trained reference librarian or search specialist must be available to give orientations or search assistance whenever the terminal is operational. If the library offers to perform searches for the user, these searches and continuation searches must be formulated by a professional librarian. A clerk/typist will be needed to enter them on a terminal, collect the results, and file them for pick-up. In addition, the increased number of interlibrary loans resulting from this service will dictate additional clerical assistance in that department.

BUDGET CONSIDERATIONS

At present, the Network charges $5,000 a year for each terminal. This price includes rental of the IBM 2740 terminal, telephone line charges, and computer time. Support for this major budget item can come from several sources depending on the School's philosophy regarding library services. A fee for use of the terminal could be charged. In fact, one of the most frequent questions asked about the service is "how much will it cost for me to use it?" The precedent for a free service is well established. Regular reference, interlibrary loan, circulation, and sometimes photocopy services are free library services. As an extension of the reference service, information retrieval can qualify as an institution-supported budget item.

Justification of this major expense must be made in terms of use. The following statistics were tabulated by the Edward G. Miner Library and the Health Sciences Library at SUNY Buffalo from November 15, 1968 through May 29, 1969.


107
TABLE 1

<table>
<thead>
<tr>
<th></th>
<th>Rochester (2 terminals)</th>
<th>Buffalo (3 terminals)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of searches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>performed during 28-week</td>
<td>1,473</td>
<td>2,698</td>
</tr>
<tr>
<td>period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average number of searches</td>
<td>52.6</td>
<td>96.3</td>
</tr>
<tr>
<td>per week—all terminals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected number of</td>
<td>1,368</td>
<td>1,669</td>
</tr>
<tr>
<td>searches per year per</td>
<td></td>
<td></td>
</tr>
<tr>
<td>terminal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average cost per search</td>
<td>$3.65</td>
<td>$3.00</td>
</tr>
<tr>
<td>Number of University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>personnel trained to use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>terminal</td>
<td>191</td>
<td>200</td>
</tr>
<tr>
<td>Number of interlibrary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>loans requested on terminal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>456</td>
<td>1,024*</td>
</tr>
<tr>
<td>Average time for reports or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>photocopies requested by</td>
<td></td>
<td></td>
</tr>
<tr>
<td>terminal from Upstate</td>
<td>2-3 days</td>
<td>2-3 days</td>
</tr>
<tr>
<td>N.Y. Network libraries</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Since May, 1969, all interlibrary loan requests addressed to the Downstate Medical Center are transmitted via TWX.

In addition, other benefits must be considered. As a new service, the terminal draws curious faculty, staff, and students into the library. While they are there, the staff can explain other library services and bibliographic tools which would be of use to them. Enthusiastic faculty members bring visiting colleagues to see demonstration searches. The Medical Center personnel view the library as a progressive department, making use of the available technological advances. A faster interlibrary loan service pleases researchers and encourages clinicians to request the service since the material now reaches them in time to be of use to them in treating their patients. A rapid interlibrary loan service also makes possible an informal cooperative acquisitions arrangement whereby the resources of medical libraries in an area such as Upstate New York can be developed without excessive duplication, especially in serials holdings. Also, the personalization of interlibrary loan contracts provides a basis for consideration of problems of mutual concern among the Network libraries.

A. Operational

1. Availability

Initially terminals were available for searching for four hours but at present they are operative from 10 a.m. to 4:30 p.m., Monday through Friday. Other times are used by headquarters staff for the Union List project, programming, file loading, maintenance, etc. The present time schedule is adequate. In both libraries demand for search time increased quickly so that reservation schedules had to be established. Time limits, of course, are absolute—searches which are not completed by 4:30 remain incomplete. Statistics on availability have not been compiled but it is our judgement that downtime is not excessive.

2. Reliability of Transmission

Problems still exist in the transmission of so-called administrative messages, e.g. interlibrary loans. (See Table 2 for an example.) The computer acts as a storage and switching device, and directs the message to a specific terminal. The reliability of this operation, although generally acceptable, is subject to failure as previously indicated. The sender is not certain whether his message has arrived at the intended station. At present all messages are acknowledged upon receipt. A remedy which will prevent the loss of messages has been promised.

3. Data Bank and Daily Operating Conditions

At present the data bank consists of the following: Index Medicus, 1966 to August 1969; Upstate Medical Center books and monographs, 1962 to date; Buffalo books and monographs, 1962 to date; Downstate Medical Center and Rochester, a limited number of records. Headquarters informs all participants of any changes in the data base and of any changes in the operating conditions of the network as needed via the terminals. This information is now supplemented by a regular publication.

LIBRARY PARTICIPATION IN A BIOMEDICAL NETWORK

<table>
<thead>
<tr>
<th>Library</th>
<th>Source of Financial Contribution to Network</th>
<th>Contribution to Data Bank</th>
<th>Cooperative Cataloging with National Library of Medicine</th>
<th>Inter-library Loans Special Handling</th>
<th>Number of Terminals</th>
<th>Advisory Committee Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Headquarters and Upstate Medical Center, Syracuse</td>
<td>N.Y. State Governor's Budget and Library's Budget — NLM Contract</td>
<td>Yes</td>
<td>Yes — Shared Cataloging NLM</td>
<td>Yes</td>
<td>5</td>
<td>Yes</td>
</tr>
<tr>
<td>Downstate Medical Center, Medical Research Library of Brooklyn SUNY at Buffalo, Health Sciences Library</td>
<td>Library's Budget</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>SUNY at Stony Brook, Biomedical Library</td>
<td>Special allocation from Medical School</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>Rochester University, E. Miner Library</td>
<td>Library Budget</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>2*</td>
<td>Yes</td>
</tr>
<tr>
<td>Columbia University, Parkinson Disease Information Center</td>
<td>NIH Contract</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>1</td>
<td>No</td>
</tr>
<tr>
<td>Harvard University, Countway Library, NLM Joint Cataloging Project</td>
<td>NLM Contract</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>National Library of Medicine</td>
<td>NLM Contract</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>Albany Medical College Library</td>
<td>Library Budget</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>New York State Library, Medical Library</td>
<td>Library Budget</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
<td>No</td>
</tr>
<tr>
<td>Ohio State University, Health Center Library</td>
<td>Library Budget</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>1</td>
<td>No</td>
</tr>
</tbody>
</table>

* One of Stony Brook's terminals will be transferred to the New York Regional Medical Program of the New York Academy of Medicine in the near future. Its relationship to the Network is the same as the Ohio State University Health Center Library. The Medical College of Ohio at Toledo has also received a terminal which is about to become operational.

4. Network Personnel and Training

Network subject specialists are stationed at Buffalo and the Downstate Medical Center. The technical specialist at Buffalo (John Theall) is completely in charge of and responsible for all Network operations. He, therefore, has trained the reference staff in search operations and conducted demonstrations and training of university personnel and groups of interested persons from industry.

The headquarters staff at Syracuse has led intensive training sessions for all network participants. It also issued a detailed manual of Network operations and keeps the subject specialists informed of changes in indexing procedures as they occur at the National Library of Medicine.

B. Intra-Network Relationships

The administrative and political structure of the Network was never clearly stated. What began as State University Wide Task Force and part of the SUNY Intrauniversity Communications Committee developed quickly into an independent unit. Initially librarians and
administrators from participating institutions were represented and formal votes were taken. When all university-wide committees were abolished in the fall of 1966, an Advisory Committee for the Director of the Network was appointed. The Network was now responsible to the Vice-President for Educational Communications who also appointed the Advisory Committee. This structure soon disintegrated. In August 1969 the Director of the Network defined his position in a memorandum as follows:

The principal administrator is the Director. The Director is responsible for budget preparation, determination of policy in conjunction with the Network Advisory Committee, implementation of goals, liaison with the library profession and is the final arbiter in decisions which relate to the Network's systems.

The organization chart shows the Director responsible to the President of Upstate Medical Center. The Advisory Committee is appointed by the Director, and its composition is given in the above memorandum as follows:

The Committee consists of the heads of the SUNY medical libraries, plus the director of the University of Rochester Medical Library and the Albany Medical College Library. In addition to the librarians on the Committee, Dr. Anthony Ralston, Director of the SUNY at Buffalo Computing Facilities, provides technical counsel. Dr. Robert Deily of Central Administration provides the liaison with Albany, and the Committee is chaired by the Director of the Network.

While the loose organization has helped the Network to pursue its goals directly and made the attainment of operational deadlines easier, it has reached the limits of usefulness with the expansion of the Network to its present membership.

In library networks we do not exchange a specific commodity whose cost is accurately determined. Libraries in a network are not equal. They differ in their contributions to a common data base, and in their needs for information. Hopefully, methods will be found to permit a more accurate assessment of costs in relation to actual use of each terminal. In the Biomedical Communication Network differences in participation are demonstrated in the following table. (See Table 2.)

Of eleven participant institutions, six are represented on the Advisory Committee, four contribute directly to the central catalog data base, and eight have agreed to give priority handling to interlibrary loan requests from other Network participants.

Questions which remain unresolved at this time are:

1. Which library becomes a member of the Network, and how? Twenty-one terminals can be attached to the present computer without causing search delays. The Director of the Network allocates terminals and decides the basis of an institution's participation.

2. How is the extent of Network participation decided? Although the fee paid by a participating library covers terminal rental, line charges, and computer search time only, can it count on having its book catalog data incorporated in the data base? At present some libraries contribute to and can make use of the data base while others can use the search capabilities of the system only.

3. The Advisory Committee is not and does not necessarily need to be representative of the participating institutions. What is needed is common goals are to be pursued and enlightened self-interest is to govern the behavior of individual libraries toward the Network is a political mechanism which provides institutional representation and review of Network policies. (Ralph Estesquest recognized this clearly and developed an enviable mechanism of democratic controls in what is now the Center for Research Libraries.)

The Biomedical Communication Network has already gone beyond a promising beginning. With the incorporation of better means of group decision it has the potential of changing the face of librarianship.

REFERENCES


LIBRARY PARTICIPATION IN A BIOMEDICAL NETWORK


FRANCES HAYNE: PLANNING HOSPITAL LIBRARY QUARTERS

We regret the omission of four items, nos. 20–23 from “Planning Hospital Library Quarters,” by Frances Hayne, Bull. Med. Libr. Ass. 58: 30–36, Jan. 1970. These items will appear correctly in the offprints:


Five subjects are presented, three by a panel, with liberal sprinkling of discussions throughout. “Furnishings,” on “the design, construction, and selection of informal furnishings for the library,” examines the philosophy behind the choices but also gives such tangibles as space formulas, with cautions. “Transportation; Transporting Books and People in the Library” is by Metcalf (see numbers 19 and 23 in this list). Although his remarks about conveyors apply chiefly to a large library occupying more than one floor, any hospital library might profit by some of the mechanical aids here considered, and space allowance for them should not be overlooked. “Audio” is well worth study for a similar reason. And “Illumination” (standards and principles) and “Flooring” (carpet versus “resilient flooring materials”) further persuaded me of the importance of all sixty-nine pages.


Although the hospital librarian is concerned with a library on a much smaller scale, he will find help here, recommendations as to what should be included in the program and valuable equipment specifications that will at least be suggestive. There are also Mr. Martin’s day-by-day plan for his move to the new NIH library and an annotated bibliography, “New Library Buildings, 1960–67” (“buildings” including many considerations).


Although about “academic planning,” this will also serve the hospital librarian. The program is defined as “a reference handbook for the architects to use throughout their planning. The easier it is, the more likely they are to use it.” How-to suggestions follow, how to write the inviting program, with recommendations as to what it should and should not do. A prime need is a librarian “who is thoroughly familiar with the dynamics of the situation.” You will be entertained by the paragraph on “the process of planning in the architect’s office,” with mention of the differences in “temperament” of architect and librarian.


I would suggest at least four chapters for the hospital librarian, first the one on the often-used modular system. The system is defined and evaluated, then presented in cause-and-effect relationship with “the depth of shelving and width of stack aisles.” In “Housing the Collections,” stacks of various types are described, illustrated, and compared, as are their “accessories” (label holders and book supports). Valuable formulas are given, with their limitations stated also. Metcalf repeatedly stresses the need of attempting to plan for the future. Lighting is presented as an indispensable adjunct of stacks and again in the section “Lighting and Ventilating.” “Furniture and Equipment,” with “quality, upkeep, finishes, cost, function,” is invaluable. Still one more chapter adds to comments on modular considerations; look for “column spacing” in “The Program of Mechanical Facilities, Comfort, and Other Requirements.” Browse liberally in this book, and be sure not to miss the five appendices. One is a nine-page “Selective Annotated Bibliography.”