

# A Regional Medical Library Network\*

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*Network—Anything reticulated  
or decussated at equal distances,  
with interstices between the intersections.*

Samuel Johnson

## ABSTRACT

The *raison d'être* for cooperative networks is discussed, and the development of the SUNY Bio-medical Communication Network is traced briefly; a description of the system and its products is given. The cooperative cataloging program engaged in with the Francis A. Countway Library of Medicine and the National Library of Medicine is described, as are the efforts of the Network in the production of regional and state-wide union lists of serials.

THE concept of a network as applied to the library, information, and education areas is relatively new; *Library Literature* only began to use the word as an indexing term in 1967.

The term itself, of course, is an old one, which came into the English language in 1590, meaning a work in which the threads or wires, etc., were arranged to form a net. In 1658, it acquired a biological-botanical meaning, and the word *reticulum* also entered the language. It was not until 1839, however, that the term was construed to convey the idea for which we use it today, and at that time it meant a complex system of railways, canals, rivers, or wireless transmitting stations. One also finds the network concept disguised under such terms as *consortium*, *interinstitutional cooperation*, *federation*, *association*, etc. A recent study made by the Office of Education showed the existence of nearly 1,300 consortia between institutions

of higher education across the country. These cooperative arrangements involved as few as two colleges and as many as eighty or more.

It is not difficult to understand the widespread interest of the academic world in networks, and there are many basic reasons for establishing them. Perhaps two of the most cogent reasons are the need to provide better, more comprehensive, and faster services to the academic community, and the fact that education continues to become more costly; we have reached a point at which society can no longer afford to pay for the luxury of endlessly replicating its academic resources.

The library-information problem was naturally susceptible to a cooperative approach, and one can consider that a network of all libraries in the country has existed for many years through interlibrary loan exchange and duplicate materials distribution systems. This alone demonstrated that mutually beneficial cooperative systems were possible, and the cooperative approach to many other, if not all, areas of library activity has long been espoused by the profession.

Perhaps the most amusing thing about cooperation, i.e., networks, is that in the past nobody really had to do anything about it. One could safely espouse the concept in the abstract because a network in the real sense was impractical. Why, then, are we suddenly concerned with networks, and why do we see incipient systems emerging in ever-increasing numbers? The answer lies in our technology. It is not just the computer which has made networks practical, for computers have been

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around a lot longer than most of us imagine; punched-card techniques as applied to the processing of information date back to the 1870's. It is the combination of advances, such as transistors, printed circuits, microreduction, reprography, microwave transmission, facsimile transmission, television recording, etc., which have all come together to change the situation and make the network a probability or a certainty rather than a possibility or a dream. The impact of such recent advances as laser technology and the development of holography (1) (not to be confused with handwriting) titillates and staggers the imagination (2). The establishment of a network makes incumbent upon the participating institutions certain constraints which have been identified as follows (3):

- (1) Member institutions cannot override or undermine the autonomy of another.
- (2) Common goals must be identified, and this information must be communicated within member institutions.
- (3) The self-interest of the member universities must be subdued.
- (4) Generally, funds for the operation of any such program are limited.
- (5) Fear of uniformity arouses faculty mistrust, and this must be alleviated.

In addition, the institutions must establish effective intra- and extramural communication and define their purpose with clarity—goals which are easier to state than to accomplish.

Many networks tend to organize on regional lines since this simplifies some of the problems involved in establishing active cooperative programs, although there are some plans, such as that described in the volume EDUNET (4), published by EDUCOM, or the planned Biomedical Communications Network of the National Library of Medicine, which are national.

The SUNY Biomedical Communication Network was conceived in the fall of 1965 by a committee of librarians, medical faculty members, and administrators from the three State University of New York medical centers.

It was designed originally to tie the four medical centers of the University together in order to amplify their resources and thus provide vastly improved services to the medical communities of the participating schools; it became obvious quite early that the usefulness of the system to be developed would be greatly enhanced through cooperation with the private

schools within the state. The Network has now evolved into a facility with connections between federal, state, and private institutions.

#### MEMBERS

As the Network began operation in the fall of 1968, there were nine participating libraries: the Health Sciences Library of the State University of New York at Buffalo, the Edward G. Miner Library of the University of Rochester Medical Center, the SUNY Upstate Medical Center Library at Syracuse, the Albany Medical College of Union University (at Albany), the SUNY Downstate Medical Center at Brooklyn, the Biomedical Library of the State University of New York at Stony Brook, The Francis A. Countway Library of Medicine of Harvard University in Boston, the Parkinson's Disease Information Center at Columbia University Medical Center in Manhattan, and the National Library of Medicine in Bethesda, Maryland.\*

#### OPERATION

The headquarters of the Network are located at the SUNY Upstate Medical Center Library in Syracuse. Each library contains one or more typewriter-style communication terminals which are connected to the system computer in Syracuse. There is a staff of more than twenty-five full-time persons, consisting of librarians, programmers, systems analysts, subject specialists, computer operators, and related technical staff, located in Syracuse, and there is one full-time liaison staff member in Brooklyn and one in Buffalo.

#### SYMBIOSIS

The Network functions are controlled by its SYSystem for Medical and BIOlogical Sciences Information Searching (hence the acronym SYMBIOSIS). The name is also intended to convey the idea of a mutually beneficial interaction between man and machine. It is an on-line, real-time, user-oriented system, which enables the person needing information to phrase his question in English words (rather than in code) directly on the terminal and to obtain an answer within the space of a few minutes. The computer phrases the query into a search equation based on the answers which are given by the

\* A tenth location, the New York State Medical Library, was added early in 1969.

## REGIONAL MEDICAL LIBRARY NETWORK

user to a series of questions which have been programmed into the system in a manner similar to that developed in programmed instruction.

### EQUIPMENT

The Network utilizes an IBM 360 Model 40 computer with 262 K core storage. Data is stored on an IBM 2321 Data Cell and on an IBM 2314 Direct Access Storage Facility. These units provide more than 600 million characters of data storage. Off-line printing is performed on an IBM 1403 printer with both an upper- and lower-case and an all upper-case print chain (Table 1).

### DATA BASE

The information stored in the Network system consists of the combined book catalog records for the three SUNY medical libraries dating from 1962 to the present, merged with the book catalog records from the National Library of Medicine from 1966 to the present. Since July 1968, the file has also been augmented by selected records from The Francis A. Countway Library of Medicine. The number of unique titles in the book segment of the data base is approximately 30,000. The second and largest body of data is composed of records obtained from the National Library of Medicine's MEDLARS file. Five years of this data are maintained on-line, consisting of the indexing of over one million journal articles which have appeared in some 2,500 international periodicals over a five-year period. The third portion of the data base consists of the records for the Union List of Serials for all libraries within the State University of New York and the member libraries of the Central New York Reference and Resources Council. These records provide holdings and location information for more than 25,000 journal and serial titles.

The collections of the libraries comprising the Network, excluding Countway and NLM, total more than 700,000 volumes, and more than 9,000 serials are currently being received.

### DESIGN AND DEVELOPMENT

As one of the first steps in the development of Network ties, IBM 2740 Communication Terminals, of the same type which would later be used to query the computer-based system, were

TABLE 1  
COMPUTER COMPONENTS IBM 360 MODEL 40

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2040 CPU 262 K
3237 Decimal Arithmetic
4427 Floating Point Arithmetic
6980 Selector Channel
6981 2d Selector Channel
7520 Storage Protect
7920 1052 Adapter
1052 Model 7 Typewriter Console
2821 Model 2 Control Unit
8637 Universal Character Set Adapter
1403 Model 2 Printer
4740 Interchangeable Chain Cartridge Adapter
8641 Universal Character Set
2501 Model B 1 Card Reader
1442 Model N 2 Card Punch
2841 Model 1 Storage Control
8079 2321 Attachment
2314 Model 1 Direct Access Storage Facility
2321 Model 1 Data Cell Drive
2403 Model 1 Magnetic Tape Unit and Control
7125 Seven Track Compatibility
2402 Model 1 Magnetic Tape Unit
2702 Model 1 Transmission Control
4615 Terminal Control Type 1
9684 Selective Speed
3233 Data Set Line Adapters
2711 Model 1 Line Adapter Unit
4794 Line Adapter Module
4641 Line Adapter
4642 Line Adapter
4643 Line Adapter
4644 Line Adapter
2740 Communication Terminals (21)
4641/4644 Line Adapter
6114 Record Checking
2316 Disk Packs
Data Cells

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installed in Buffalo, Syracuse, and Brooklyn. These became operational in December 1966. In October 1967, Rochester also acquired a terminal and joined the system actively. These terminals are used for exchange of interlibrary loan data, reference requests, and other administrative messages concerned with the libraries and the Network. The terminals have functioned very well, and a considerable change has been made in patterns of interlibrary borrowing.

The Network is primarily oriented to the user, and secondarily, to the automation of library housekeeping routines. At its commencement, its goals and functions are as follows:

*Primary*

(1) Production of a computerized union catalog of monographs for the three SUNY medical libraries, published from 1962 onward.

(2) Production of union lists of serials and books with periodic updating (this may include the three medical libraries, the entire fifty-eight campus SUNY library system, or a combination of libraries within the system).

(3) Search of the combined catalogs of Buffalo, Syracuse, and Brooklyn for monographs bearing imprint dates of 1962+ and NLM *Current Catalog* data from 1966+. Eventually ten years of book data will be stored on-line. Book records can be searched by author, title, subject, and other special fields if desired.

(4) Search of five years of MEDLARS data, obtained from the National Library of Medicine. These can be searched by author (name) or subject, with the usual limiting parameters of time, language, date, etc.

(5) Search of the *SUNY Union List of Serials* data, consisting of over 20,000 current and noncurrent periodical titles held in the sixty libraries of the State University of New York, plus Syracuse University, Hamilton College, Colgate University, and several smaller schools and special libraries.

(6) Preparation of lists of currently received titles for each campus, or for the entire system, of books—arranged by author or subject—and of journals—arranged by title or subject—or any desired combination. The information dissemination aspect of this phase is of great importance to all faculty, research staff, and student users.

(7) Education and training of library personnel and orientation and training for users.

(8) Current-awareness services—Selective Dissemination of Information (SDI). Individual faculty members or research groups could be notified of new articles and books in their specialized fields of interest as each new MEDLARS tape is received and as catalog information is added to the master files.

(9) Key Word in Context (KWIC) indexing of appropriate local research data, and if desired, of journals not covered by the major indexing services.

(10) Recurring bibliographies, e.g., monthly for a specific research group or project.

(11) Research and development in techniques for information storage and retrieval.

*Secondary*

(1) Computerized ordering procedures for the libraries as described by each campus.

(2) Computerized circulation records for the libraries as described by each campus.

(3) The production of serial records, including desiderata lists, recording of items received, ordering and renewal, etc., as desired by each campus.

The major elements of the data base will be augmented by the circulation records for the Upstate Medical Center Library and the other libraries as they develop automated circulation systems.

OPERATION

The fact that SYMBIOSIS is an on-line, real-time computer system means that the user himself performs the input of his question rather than having to have it formulated for him by a searcher, and receives his answer within a few minutes of the completion of the search request (Fig. 1).

The user signals the system by pressing an attention key on the input-output terminal, which serves to tell the system that someone wishes to ask a question and where that person is located. The system then begins to ask a series of questions which are, in effect, very much like an automated reference interview. The purpose of the questioning is to allow the machine system to formulate the necessary search equation which will provide the information the user seeks. The question tree which the user follows can be stopped at various points to allow the search to start; however, the farther through the tree the user goes, the more specific the search formulation and the higher the probability of a more relevant search result (Fig. 2).

To take a specific example, let us suppose that the user has wanted subject information and has said that he did not want to search through the book records only. After the search is made by the machine, a random sample of ten retrieved citations for journal articles and ten citations for books is typed out for him at the terminal. The information he is given at this point consists of the basic complete citation. He

## *Searching:* *User's Terminal + Computer*

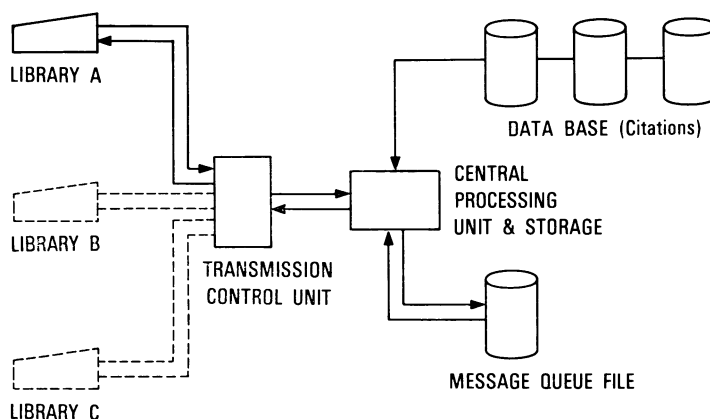


FIG. 1.—A schematic diagram showing the elements of the system called into action by a user query. The search is performed in the Central Processing Unit, and the relevant citations are retrieved from the Data Base. This information is stored in the Message Queue File until it is ready to be returned to the user.

reads these and selects the items which appear most promising to him. He types the numbers of the citations (j 1 and j 5 for journals and b 7 for a book), and the system then completes the necessary data. For the journal article, it finds the location of the particular title by searching the records contained in the *Union List of Serials* for the Network libraries, and if the title is held in the library that the user is in, he is given the shelving title or call number, so that he can obtain the article. If the title is not in his library, the system checks to see which library owns the title, going through a priority of locations, depending upon the user's location (that is, looking for the closest available copy). When it has been determined where the item can be obtained, the user is told that it will be obtained for him on interlibrary loan and that he will receive the item or a copy within a specified period of time (determined from a study of interlibrary loan patterns) unless he stops the process by pressing the letter "n" (for "no") on the keyboard. If he does not stop the process, the interlibrary loan request is automatically typed out on the terminal reserved for administrative messages in the selected library, and a duplicate message is produced at the administrative terminal in the user's library. In the case of book materials, the pro-

cedure is similar except that the user is given the call number of the book (Fig. 3).

One of the first modifications of the system will be the inclusion of circulation records as each library develops its automated circulation system. These will enable a check to be made of desired items to see if they are already in circulation, before sending the user to the shelves. Should one of the books or journal volumes be out, the user will be given the option of obtaining the item on interlibrary loan or waiting for the item to be returned. At the same time, a letter will be generated telling the current user that the item he has is either wanted by another reader, and noting whether it is overdue, or asking him to return it before the due date if possible.

Before the user leaves the terminal, he is given the opportunity to request the entire bibliography which has been retrieved for him. If he asks to see all the citations, they are printed out in the computer center on a high-speed printer and forwarded to him.

### RECORD FORMAT AND CONTENT

Because the system was designated as a university-wide system prototype, the Network has done some things which might not be considered justifiable in terms of a system devoted solely

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start
DO YOU WANT BOOKS ONLY?
n
CHOOSE THE TYPE OF SEARCH IN WHICH YOU ARE INTERESTED.
  A. SUBJECT
  R. AUTHOR
  F. TITLE CODE
a
THIS IS THE FIRST SUBJECT OF THE FIRST GROUP.
TYPE IN A HEADING OR A HEADING AND SUBHEADINGS.
PRECEDE SUBHEADINGS WITH AN * .

heart

ANOTHER SUBJECT TO THIS GROUP?
n
DO YOU WANT TO BEGIN ANOTHER GROUP OF SUBJECT HEADINGS?

transplantation

ANOTHER SUBJECT TO THIS GROUP?
n
DO YOU WANT TO BEGIN ANOTHER GROUP OF SUBJECT HEADINGS?

human

ANOTHER SUBJECT TO THIS GROUP?
n
DO YOU WANT TO BEGIN ANOTHER GROUP OF SUBJECT HEADINGS?

n
DO YOU WANT TO RESTRICT YOUR SEARCH TO PARTICULAR
AUTHORS, JOURNALS, DATES, OR LANGUAGES?
y
DO YOU WANT TO SPECIFY AN AUTHOR(S)?

n
DO YOU WANT ALL JOURNAL TITLES SEARCHED?

n
```

FIG. 2.—Page 1

FIG. 2.—The printout of an actual search and a graphic representation of the question. The computer questions are shown as upper-case printing and the user's answers in lower-case letters. The system is designed to allow the user to type as little information as possible or necessary. The resultant search is organized into two sections: first, journal citations; then, book citations. The total result of the journal citation search was forty out of the total file of 66,000 at the time the search was performed. There was no result from the search of the book file. The result total is printed twice because the book file is divided into two sections, one for SUNY network books, and one for the NLM *Current Catalog* file.

to medical and biological information. The most significant policy decision made at the outset was that, whatever was done, it must be as widely compatible as possible, and in view of the activities of the Library of Congress in developing a machine-readable cataloging format (MARC), it meant adopting the MARC format. Since it is likely that this is to be the national format which all libraries will either use or arrange to be compatible with, the Network adopted the MARC format as its standard, and was designated as a Library of Congress MARC center in the pilot project in October 1967. The staff of the Network has been working closely with the systems staff of the Library of Congress

and has consulted with them on the development of the MARC II format which will be in use by the second half of 1968. It is interesting to note that the MARC format has also been adopted by the British National Bibliography, which means that machine-readable records for virtually all English language materials will soon be available to any library (Fig. 4).

One of the more significant experiments undertaken in SYMBIOSIS is the depth-indexing of the monographic literature. It is accepted as a truism that the medical book literature is not as important as the journal literature, and most libraries can show circulation records which indicate that the volume of journal material cir-

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DO YOU WANT TO:  
A. BE RESTRICTED TO  
B. ELIMINATE  
ONE OR MORE JOURNAL TITLES?  
b  
LOOK-UP AND TYPE IN A JOURNAL TITLE CODE.  
095  
ANY MORE?  
n  
ARE YOU INTERESTED IN RESTRICTING YOUR SEARCH  
TO SPECIFIC YEARS OF PUBLICATION?  
n  
ARE YOU INTERESTED IN ANY LANGUAGE(S)  
OTHER THAN ENGLISH?  
n  
YOUR INQUIRY IS BEING PROCESSED.

ARE YOU ASSOCIATED WITH THIS INSTITUTION?

y  
ARE YOU:  
A. FACULTY            B. STAFF  
C. STUDENT           D. OTHER

a  
TYPE IN YOUR NAME, A / AND DEPARTMENT.  
pizer/library

```
OPTION AMEDLP01,STAT;
K001 HEART;
K002 TRANSPLANTATION;
K003 HUMAN;
K004 K001 & K002 & K003;
LIST LOCAL,AUTHORS,TITLE,JTA,PUBDATE,PAGES,LANGUAGE,JTC;
R001 IF JTC NE '095';
R002 IF LANGUAGE EQ 'ENG';
R003 IF R001 AND R002;
END;
RESULT            000040
```

```
2742            J0
AUTHORS:       WINDSOR H
TITLE:          HEART TRANSPLANTATION, OR KEEPING BOTH FEET ON THE GROUND.
JTA:            MED J AUST
PUBDATE:       18 MAY 68
PAGES:          1,869-70
LANGUAGE:       ENG
```

FIG. 2.—Page 2

culated exceeds the amount of book material. However, it seemed reasonable to hypothesize that the book literature was not used as heavily as it might be due to the fact that its content is inaccessible compared to the journal literature content. It was decided, therefore, that a sample of the literature would be indexed in depth in order to see whether the greater ease of accessibility and refinement of subject analysis might not make this body of material much more useful. Since there was no easy way of drawing a sample of the literature, we undertook to depth-index the entire collection of 1962+ monographic literature at the Syracuse site. This amounted to 6,700 titles requiring analysis, and an average of seven subject headings was applied to each chapter of each book. The depth-indexed material will be retrieved

by users at any one of the locations, and we will be able to determine whether depth-indexed material is retrieved and selected by the user more often than regularly cataloged books. To insure that the user is not misled into believing that he is obtaining a book full of information rather than a chapter, the citation, when retrieved, will give the chapter number and pages, so that it is clear that only a segment of a book pertains to the user's query (Fig. 5).

### NLM CURRENT CATALOG CONTRACT

Since July 1967, the Network has been working on a contract from the National Library of Medicine to convert its *Current Catalog* records, which are produced under MEDLARS, to the format of the Library of Congress (MARC). The work on this portion of the contract is

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9865 J1  
AUTHORS: KANE HA  
TITLE: RECENT ADVANCES IN PEDIATRIC CARDIOLOGY.  
JTA: PEDIAT CLIN N AMER  
PUBDATE: MAY 68  
PAGES: 15,345-56  
LANGUAGE: ENG

16414 J2  
AUTHORS:  
TITLE: TOO MANY TOO SOON.  
JTA: LANCET  
PUBDATE: 29 JUN 68  
PAGES: 1,1413-4  
LANGUAGE: ENG

19029 J3  
AUTHORS: LOWER RR  
TITLE: CARDIAC TRANSPLANTATION IN PROPER PERSPECTIVE.  
JTA: SURG GYNEC OBSTET  
PUBDATE: APR 68  
PAGES: 126,838-9  
LANGUAGE: ENG

19319 J4  
AUTHORS:  
TITLE: BARNARD AND HIS CRITICS.  
JTA: CANAD MED ASS J  
PUBDATE: 16 MAR 68  
PAGES: 98,557-8  
LANGUAGE: ENG

20884 J5  
AUTHORS: MERRILL JP  
TITLE: HUMAN TISSUE TRANSPLANTATION.  
JTA: ADVANCES IMMUN  
PUBDATE: 1067  
PAGES: 7,275-327  
LANGUAGE: ENG

27916 J6  
AUTHORS: SHAMBAUGH GF JR  
TITLE: MEDICAL ETHICS, HEART TRANSPLANTATION, AND OTOLARYNGOLOGY.  
JTA: ARCH OTOLARYNG (CHICAGO)  
PUBDATE: MAY 68  
PAGES: 87,453-5  
LANGUAGE: ENG

FIG. 2.—Page 3

completed, and the machine-readable records for two of the three national libraries are now in an identical form which can be used with ease. Another portion of this contract calls for the creation of a master machine-readable data base for monographic materials in Syracuse. This data base will not only contain all *Current Catalog* input records from 1966, but will also contain records which are submitted to NLM by The Francis A. Countway Library of Medicine and the Upstate Medical Center as part of the NLM Shared Cataloging Program. These entries, which now appear in the printed *Current Catalog*, are the first steps toward increasing the scope of the *Current Catalog* to make it more representative of the needs of medical schools. This union catalog of records

will be added to the entire Network data base and will thus be searchable on-line from any of the nine locations mentioned. It is hoped that this type of union catalog can eventually be made available to any medical library in various ways, perhaps the simplest being the production of catalog-card sets. The buyer would submit a list of NLM *Current Catalog* citation numbers, or LC card numbers, and receive the entire set of cards ready for filing in the catalog.

### TERMINOLOGY

One of the first problems to be solved in any system, whether a single library system, or a regional or national network, is the problem of language. Part of the language problem is solved for us due to the fact that MEDLARS



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J7  
 34468  
 AUTHORS: CARDIAC TRANSPLANTATION IN MAN. STATEMENT PREPARED BY THE BOARD ON MEDICINE OF THE NATIONAL ACADEMY OF  
 TITLE: SCIENCES.  
 JAMA  
 JTA: 27 MAY 68  
 PURDATE: 204,835-6  
 PAGES: 204,835-6  
 LANGUAGE: ENG

J8  
 34475  
 AUTHORS: THE SKY WATCHERS.  
 TITLE: JAMA  
 JTA: 27 MAY 68  
 PURDATE: 204,820-1  
 PAGES: 204,820-1  
 LANGUAGE: ENG

J9  
 34530  
 AUTHORS: SANDLER R  
 TITLE: CAPTIC TRANSPLANTATION.  
 JTA: LANCET  
 PURDATE: 18 MAY 68  
 PAGES: 1,1086-7  
 LANGUAGE: ENG

#  
 OPTION NETROOK1,STAT;  
 K001 HEART;  
 K002 TRANSPLANTATION;  
 K003 HUMAN;  
 K004 K001 & K002 & K003;  
 LIST LOCAL,AUTHOR,TITLE,IMPRINT,ISSUMRR,CALLUMC,CALLHSL,CALLDOC,CALLPDS,CALLNLM;  
 R001 IF LANG EQ 'FNG';  
 R002 IF DATE1 EQ '1968';  
 R003 IF R001 AND R002;  
 END;  
 RESULT 000000  
 RESULT 000000

#  
 ARE YOU INTERESTED IN ANY OF THE ABOVE CITATIONS?  
 J0 J5  
 J0 M26 0001  
 AVAILABLE AT THIS LIBRARY, SHELVED ALPHABETICALLY

J5 2M9 0007  
 AVAILABLE AT THIS LIBRARY, SHELVED ALPHABETICALLY

F O S

Fig. 2.—Page 4

used *MeSH* terms, and these same terms are used in the *Current Catalog*. There is a problem, however, because not all books can be cataloged using *MeSH* terms, or for some books, the terms are fitted poorly. The libraries in the Network decided that they would accept Library of Congress subject headings for all nonmedical books (in the NLM sense) and use *MeSH* terms for the remainder. This presented us with the problem of coordinating the list of Library of

Congress and National Library of Medicine headings. This problem is being approached in several ways, one of which is to produce a unified authority list. This is done by machine with a program which pulls out all headings used in the cataloging process and arranges them alphabetically. This allows the cataloger to have an up-to-date authority list at his desk, and also to spot inconsistencies and mistakes which might never have been noticed in a card-form catalog. Another list is also made by pulling out the main entries, author added entries, etc., and thus obtaining a name authority list. This again makes it easy for the cataloger to standardize form of name, dates, etc., all things which most libraries have had to forego in order to keep up with the flood of work. Another approach to the language problem is to make the system responsive to the language of the user, so that he can query the system in his own terms. In order to do this, a vast amount of cross-referencing from commonly-used terms to accepted index terms must be done, or else the user is

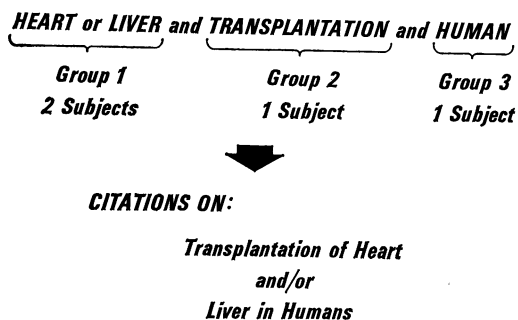


FIG. 2.—Page 5

### ***User-Initiated Interlibrary Loan Request***

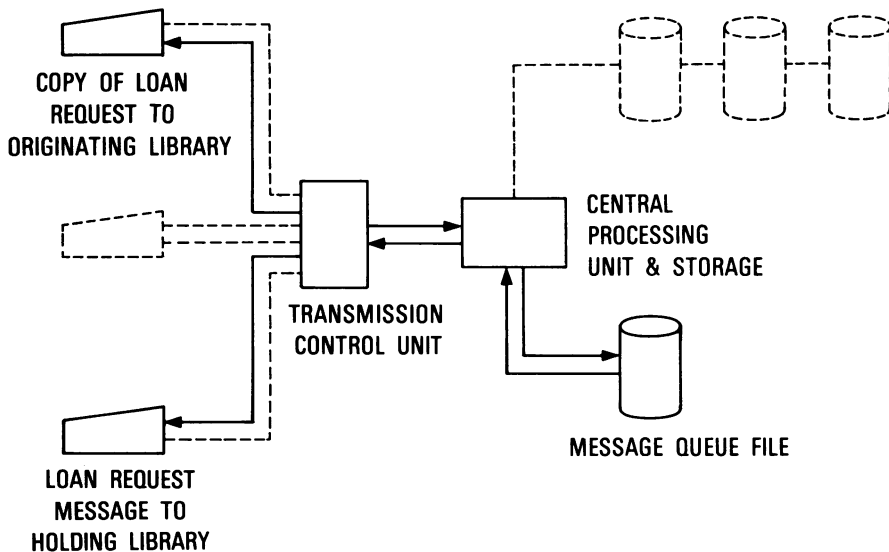


FIG. 3.—A schematic diagram showing the elements of the system called into action by a user's demand for a citation which was not in his library. The citation which the user selected is reformatted into a standardized interlibrary loan message and transmitted to two administrative terminals, one in the user's library, and one in the lending library. Non-availability of the item is communicated to the borrowing library by an administrative message which the interlibrary loan staff member types on his terminal and addresses to the administrative terminal of the library which had requested the material.

# REGIONAL MEDICAL LIBRARY NETWORK

STATE UNIVERSITY OF NEW YORK BIOMEDICAL COMMUNICATION NETWORK  
CONVERSION INPUT FORM

Supp.	Type of Entry	Listing	Illus.	Map	Form	Level	Edition
/	<input checked="" type="checkbox"/> Personal <input type="checkbox"/> Uniform <input type="checkbox"/> Title <input type="checkbox"/> Corporate	<input type="checkbox"/> Bib <input type="checkbox"/> Rev <input type="checkbox"/> Ab <input type="checkbox"/> Cat <input type="checkbox"/> Ind <input type="checkbox"/> F Dir	<input type="checkbox"/> Present <input type="checkbox"/> Mono dr <input type="checkbox"/> Col dr <input checked="" type="checkbox"/> Mono ph <input type="checkbox"/> Col. ph	<input type="checkbox"/> Map <input type="checkbox"/> Post <input type="checkbox"/> Map & Por	<input type="checkbox"/> Cont <input type="checkbox"/> Essay <input type="checkbox"/> Outline <input type="checkbox"/> Thesis <input type="checkbox"/> Q & A	<input type="checkbox"/> J <input type="checkbox"/> J <input type="checkbox"/> J <input type="checkbox"/> Text <input type="checkbox"/> Lab	<input type="checkbox"/> No. <input type="checkbox"/> Word

Language			Publication				Copy Statement			
Class	Lang 1	Lang 2	Key	Date 1	Date 2	Place	Publisher	U	D	H
3	Eng	/	C	1963	/	LSP	THOM	2	2	/

E

Tag Description

05 UMC Call Number  
 06 DMC Call Number  
 07 HSL Call Number  
 10 Main Entry  
 15 Title  
 25 Remainder  
 30 Imprint  
 40 Collation  
 50 Series - add  
 51 Series - no  
 52 Notes - store  
 65 Notes - no  
 70 Subject Tracing  
 71 Personal Tracing  
 72 Corporate Tracing  
 73 Uniform Tracing  
 74 Title Tracing  
 75 Series Tracing  
 95 UMC Accession Number

10 Daco, Michael M.  
 Restorative medicine in geriatrics. By Michael M. Daco, with 15 contributors. Introd. by Howard A. Ruak. Springfield, Ill.: Thomas, 1963. 75 p. 11cm, 24 cm. (American lecture series, publication no. 840) American lectures in physical medicine and rehabilitation) Includes bibliograph.

70 Geriatrics & Disabled-Rehabilitation, etc. - 9500 7-11  
 65-11818

7/ 2063

11012

RN

FIG. 4.—The conversion input form used by the Network is basically the same as that used by the Library of Congress MARC project. The format shown is MARC I which was still in use through 1968.

forced to look up each subject heading to make sure it is acceptable to the system. Since the latter approach was unacceptable to us, we have been compiling an augmented thesaurus for the past year, which will continue to grow as the system operates. One of the methods of compiling the list, however, has been to take the words used by the authors in titles of journal articles and relate them to the terms under which they were indexed in *Index Medicus*, thus creating a bridge from the user's terminology to the system's terminology (Figs. 6 and 7).

### BY-PRODUCTS

The establishment of a data base, such as the one which has been created for the Network, offers the exciting prospect of many different kinds of by-products which would not be available otherwise or only at a cost which would make their production prohibitive.

One such product which has generated considerable interest among medical libraries is a

deck of catalog guide cards containing all of the current *MeSH* subject headings and cross references. This deck, consisting of some 10,000 guide cards, can be produced much more economically by computer than by hand and can easily be updated or replaced annually at only a moderate cost. The National Library of Medicine has given the Network permission to produce such decks of cards from its *MeSH* records as a service to other libraries.

Another product, which has great meaning for new schools or larger libraries, is a deck of cards containing all of the monograph cataloging information for a certain time period. For example, the Network has been working closely with the individuals responsible for the development of the Biomedical Library at Stony Brook for the past year, and on-line terminals were installed in that Library's temporary location in September 1968. Stony Brook will make use of the Network's data base of book cataloging to acquire and catalog its collection. To do this, the

IRWIN H. PIZER

STATE UNIVERSITY OF NEW YORK BIOMEDICAL COMMUNICATION NETWORK  
DEPTH INDEXING FORM

MAIN HEADING	*subheading	CHAPTER NOS.	CHECK TAGS	CHAPTER NOS.
-PAPANOCT--			CASE REPORT	
GERIATRICS		0	CLINICAL RESEARCH	
AGED		0	HUMAN	U
NERVOUS SYSTEM	*physiopathology	1	FEMALE	
MUSCLES	*physiopathology	1	MALE	
EXERCISE THERAPY		1	INFANT NEWBORN - 1 mo	
PHYSICAL EXAMINATION		2,4	INFANT 1 - 23 mo	
BRACES		6	CHILD, PRESCHOOL 2-5 yrs	
BRACES	*instrumentation	6	CHILD 6 - 12 yrs	
HEMIPLEGIA		6	ADOLESCENCE 13-18 yrs	
HEMIPLEGIA	*rehabilitation	6	ADULT 19 - 44 yrs	
FRACURES		7,8	MIDDLE AGE 45-64 yrs	
FRACURES	*surgery	7	AGED 65 +	U
HIP	*injuries	8	ANIMAL EXPERIMENTS	
FRACURES	*rehabilitation	8	CATS	
AMPUTEES		9	CATTLE	
PROSTHESIS		9	DOGS	
AMPUTATION		9	GUINEA PIGS	
AMPUTATION	*therapy	9	MICE	
AMPUTATION	*rehabilitation	9	MONKEYS	
OSTEOPOROSIS		10	RABBITS	
OSTEOPOROSIS	*therapy	10	RATS	
JOINT DISEASES		11	IN VITRO	
JOINT DISEASES	*classification	11	COMPARATIVE STUDY	
JOINT DISEASES	*therapy	11	HISTORY OF MEDICINE	
GRTI		12	BIOGRAPHY	
CHRONIC DISEASE		12	HISTORICAL WORK	
CHRONIC DISEASE	*prevention & control	13	Ancient	
MENTAL HEALTH		14	Medieval	
ENVIRONMENT		15	Moderate	
PATIENTS		16	19th Cent	

CHAPTER INDEX		
01: 7-35	11: 211-229	21:
02: 36-51	12: 230-244	22:
03: 52-71	13: 245-258	23:
04: 72-89	14: 259-274	24:
05: 90-108	15: 275-289	25:
06: 109-124	16: 290-298	26:
07: 125-133	17:	27:
08: 134-139	18:	28:
09: 140-169	19:	29:
10: 170-210	20:	30:

FIG. 5.—Part two of the conversion input form contains the chapter-by-chapter depth-indexing which has been performed by the Network's staff of subject analysts. As can be seen, the number of subject headings assigned to this particular book has been expanded from two to thirty, plus two check tags. In addition, a chapter index has been created so that the user will obtain specific page information regarding this book and the segment which relates to his question.

Network produces two copies of a card containing all of the cataloging data for materials copyrighted in 1966, 1967, and 1968. These cards are then screened to determine which items are needed for the local collection. Those selected are ordered by sending one copy of the computer-produced catalog card to the vendor and placing one copy in an "on-order" file. When the item is received, the "on-order" card is moved to another file, which then becomes the author-title catalog for the materials on hand. Since all cataloging information is present on this card, including a classification number, this information can be copied onto duplicating masters to produce the card sets needed for the Biomedical Library's catalog and for the University Library's main catalog. After the Network becomes operational, card sets will be able to be produced directly on the high-speed, upper- and lower-case printer by computer, and the step of clerical copying of the catalog information will be eliminated, together with the opportunities

for human error and the professional proof-reading which such copying entails. Because the Stony Brook Biomedical Library has no books on its shelves at this time, the classification number, which has already been assigned to the work when cataloged in one of the other libraries, can be used without alteration, thus saving a time-consuming and costly job (Fig. 8).

Since there are several other new medical schools under development at this time, both public and private, it is not surprising that this capability has caused considerable interest, and we have received inquiries as to whether such services could be offered on a contract basis. The Health Sciences Library in Buffalo is also considering a major revision in its technical processing routines to take fuller advantage of the Network's capabilities.

The *SUNY Union List of Serials* has been edited and produced at the Upstate Medical Center since 1965 and now forms an integral part of the data base of the Biomedical Com-

## REGIONAL MEDICAL LIBRARY NETWORK

PAGE 3

C3835 AIKEN, HENRY DAVID, % 1912%-  
 05009 AINSWORTH, GEOFFREY CLOUGH, % 1905%- ED. %  
 05119 AISEN, PHILIP, % JOINT ED. %  
 05131 AITKEN, J. T.  
 05152 AITKEN, JOHN THOMAS, % JOIN AUTHOR. %  
 05836 AJELLO, LIBERO, % 1916%-  
 06053 AKADEMIIA NAUK SSSR. % INSTITUT KHIMICHESKOI FIZIKI.  
 C0991 AKADEMIIA PEDAGOGICHESKIKH NAUK RSFSR, % MOSCOW. INSTITU  
 DEFKTOLOGII.  
 06702 AKERT, KONRAD, % JOINT AUTHOR. %  
 06664 AKSTENS, ISABEL C.  
 05494 AL-KINDI, D. CA. 873.  
 C5807 ALBA, AUGUSTO, % 1923%-  
 C5439 ALBANESE, ANTHONY AUGUST  
 07095 ALBERT EINSTEIN COLLEGE OF MEDICINE, % NEW YORK. % D. SAMUEL  
 GOTTESMAN LIBRARY.  
 02451 ALBERT EINSTEIN MEDICAL CENTER, % PHILADELPHIA.  
 04681 ALBERT, ADRIEN, % 1907%-  
 06054 ALBERT, ADRIEN % 1907%-  
 C0036 ALBERT, SALOMON NAPHTHALI  
 C5860 ALBERT, SOLOMON N.  
 C1282 ALCOCK, THEODORA  
 00989 ALCOHOLISM AND DRUG ADDICTION RESEARCH FOUNDATION.  
 03458 ALEXANDER, EDYTHE  
 01115 ALEXANDER, FRANZ, % 1891%-  
 05739 ALEXANDER, HARRY L., % JOINT AUTHOR. %  
 04476 ALEXANDER, PETER, % 1917%-  
 03434 ALFORD, DOLORES MARSH  
 06501 ALKEN, CARL ERICH, % 1912%- ED. %

FIG. 6.—The main-entry authority file created by computer from the record, tagged with the MARC code for Author or Corporate Body. The system strips the information from the record and then alphabetizes the data on a character-by-character basis.

munication Network. In the period of its existence, the Network has developed considerable expertise in the production of such a tool and is now in a position to generate various sublistings and regional listings at will. Negotiations have been completed with the New York State Library relative to the production of a state-wide *New York State Union List of Serials*. The contract calls for the publication of the first edition of the list in the last quarter of 1969.

The Network has just finished the compilation of the first regional Union List for the Central New York References and Resources Council, under the state's 3 R's program, at a cost which is substantially lower than if the work had been compiled *de novo* by the Council, and in much

less time (5). Should the production of a state-wide list for the State Library become a reality, it is reasonable to anticipate that other regional listings could be produced for the remaining eight 3 R's councils. These would have the major advantage of being uniform in size, format, and style, and all records would be machine-compatible and searchable.

One possibility for expanding human resources, which the Network makes available to us, lies in the area of coordinate scheduling of professional staff. The Network's telecommunications links enable a user in one library to carry on a conversation with a professional librarian at another site, so that if the libraries in the Network so desire, professional staff can

C2218 LEUKOCYTES.  
 C4396 LEWIS, SINCLAIR.  
 C4261 LIBERTY.  
 C3694 LIBRARIES, MEDICAL.  
 C4703 LIBRARIES AND STATE--U.S.  
 C4791 LIBRARIES.  
 C3709 LIBRARIES--AUTOMATION --CONGRESSES.  
 C6581 LIBRARIES--AUTOMATICN--CONGRESSES.  
 C6586 LIBRARIES--DIRECT.  
 C6585 LIBRARIES--DIRECTORIES.  
 C6596 LIBRARIES--NEW YORK (CITY).  
 C6595 LIBRARIES--STATISTICS--U.S.  
 C3701 LIBRARIES--U.S.  
 C6594 LIBRARIES--U.S.--DIRECTORIES.  
 C6588 LIBRARIES, HOSPITAL.  
 C6661 LIBRARIES, HOSPITAL--BIBLIO- GRAPHY.  
 C6589 LIBRARIES, MEDI- CAL.  
 C6757 LIBRARIES, MEDICAL.  
 C6591 LIBRARIES, MEDICAL--CATALOGS.  
 C6760 LIBRARIES, MEDICAL--DIRECTORIES.  
 C6592 LIBRARIES, MEDICAL--LEGISLATION.  
 C6583 LIBRARY ASSOCIATIONS--DIRECTORIES.  
 C4703 LIBRARY EXTENSION--U.S.  
 C4286 LIBRARY SCHOOLS.  
 C6593 LIBRARY SCIENCE.  
 C6583 LIBRARY SCIENCE-- DIRECTORIES.  
 C6595 LIBRARY SCIENCE--DICTIONARIES.  
  
 C3562 LIBRARY SURVEYS.

FIG. 7.—The authority file created by computer from the subject field in the MARC record. This file is created in the same manner as the main-entry file.

be scheduled at different times to be responsible for answering queries which might emanate from another station, thus spreading the evening and weekend work load over several libraries and many staff members, and offering the professional some challenges to his intellect and skill in trying to solve a user's problem at a distance and perhaps with different tools than might be available locally. Since it is often the case that the professional who works evenings or weekends does not have a constant stream of inquiries to keep him occupied, such a coordinated system makes use of the available time and talents more efficiently.

#### SEARCH CAPABILITY

The unique organization of the Network files allows the user to make various types of

searches which are not possible at the present time or not particularly practical to perform manually. If the user is the acquisitions librarian, for example, he can request a list of all items received from a certain publisher within, let us say, the last six months; or a sub-catalog of materials in the library in a certain language can be prepared, etc. Many people have been concerned with the problem that a machine-retrieval system does not allow the user to "browse" and thus find relevant items serendipitously. Due to the use of the MARC record format, this problem is overcome to a degree by the Network, since the user can request a printout of all books which have been classified together. If he is interested in knowing what books are available on the subject of "intravenous anesthesia" that have been re-

## REGIONAL MEDICAL LIBRARY NETWORK

SHERIF, CAROLYN W.  
ATTITUDE AND INVOLVEMENT APPROACH, THE SOCIAL JUDGMENT-INVOLVEMENT APPROACH. BY CAROLYN W. SHERIF, MUZAFER SHERIF AND ROGER E. NEBERGALL. PHILADELPHIA, SAUNDERS, 1965.  
XXI, 264 P. ILLUS. 24 CM. BF 323 C 5 S 552A 1965  
I. ATTITUDE. I. SHERIF, MUZAFER, 1905-JOINT AUTHOR. II. NEBERGALL, ROGERELLIS, 1926-JOINT AUTHOR. III. OKLAHOMA. UNIVERSITY. INSTITUTE OF GROUP RELATIONS. IV. T

LEVINE, MURRAY, 1928 -  
THE RORSCHACH INDEX OF REPRESSIVE STYLE. BY MURRAY LEVINE AND GEORGE SPIVACK. SPRINGFIELD, ILL., THOMAS (1964)  
XVI, 164 P. 24 CM. BF 337 R 35 L 665R 1964 (AMERICAN LECTURE SERIES, PUBLICATION NO. 573. A MONOGRAPH IN AMERICAN LECTURES IN PSYCHOLOGY)  
I. RORSCHACH TEST. 2. REPRESSION. I. SPIVACK, GEORGE, JOINT AUTHOR. II. T

FIG. 8.—A sample showing two records which have been printed out from the master file for use as an acquisitions tool. This record is informally formatted and is intended merely to provide the necessary information for acquisitions and cataloging. The call number has been shifted to the end of the collation statement for programming convenience and to save space. Words are divided by a computer count of the number of characters on a line, except that at least two letters of a word must be on the line or the entire word is printed on the next line.

ceived in the last six months, he can request a search of the NLM call number WO 285 for 1968. This will, in effect, obtain for him a printout of what we would call the shelflist, if it were in card form, but which is a tool not normally available to him. Such a technique has obvious meaning for the library staff as well as for the user.

The capabilities now available to us will provide both experience and data of great value in the establishment of a national biomedical communication network, as well as vastly improved service to each of the libraries which is connected to the system. It is our hope that this system can be extended to each of the hospitals in the Regional Medical Programs so that, no matter how small or remote, all the resources of the Network, backed up by the collections of the National Library of Medicine, will be available to the practitioner.

It must be said that it is only through the dedicated efforts of the Network's staff of twenty-five librarians, subject analysts, programmers, systems analysts, computer experts,

machine operators, secretaries, etc., that what seemed like an ambitious plan in 1965 has been turned into an operational reality; and for their diligent efforts we are truly thankful. The task of the librarians of the member stations of the Network has been no less difficult, for each has had to relinquish some measure of autonomy, including changes of policy and procedures, in order to create a viable system; and their cooperative enthusiasm is perhaps the most important single necessary ingredient which has gone into the building of this system.

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2. ANNAN, GERTRUDE L. A rose is a rose (Editorial). *Bull. Med. Libr. Ass.* 56: 312, July 1968.
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4. Summer Study on Information Networks, University of Colorado, 1966. EDUNET; Report. Brown, G. W.; Miller, J. G.; Keenan, T. A., authors and editors. New York, Wiley, 1967.
5. BRODMAN, ESTELLE. Book review. *Bull. Med. Libr. Ass.* 56: 544-545, Oct. 1968.