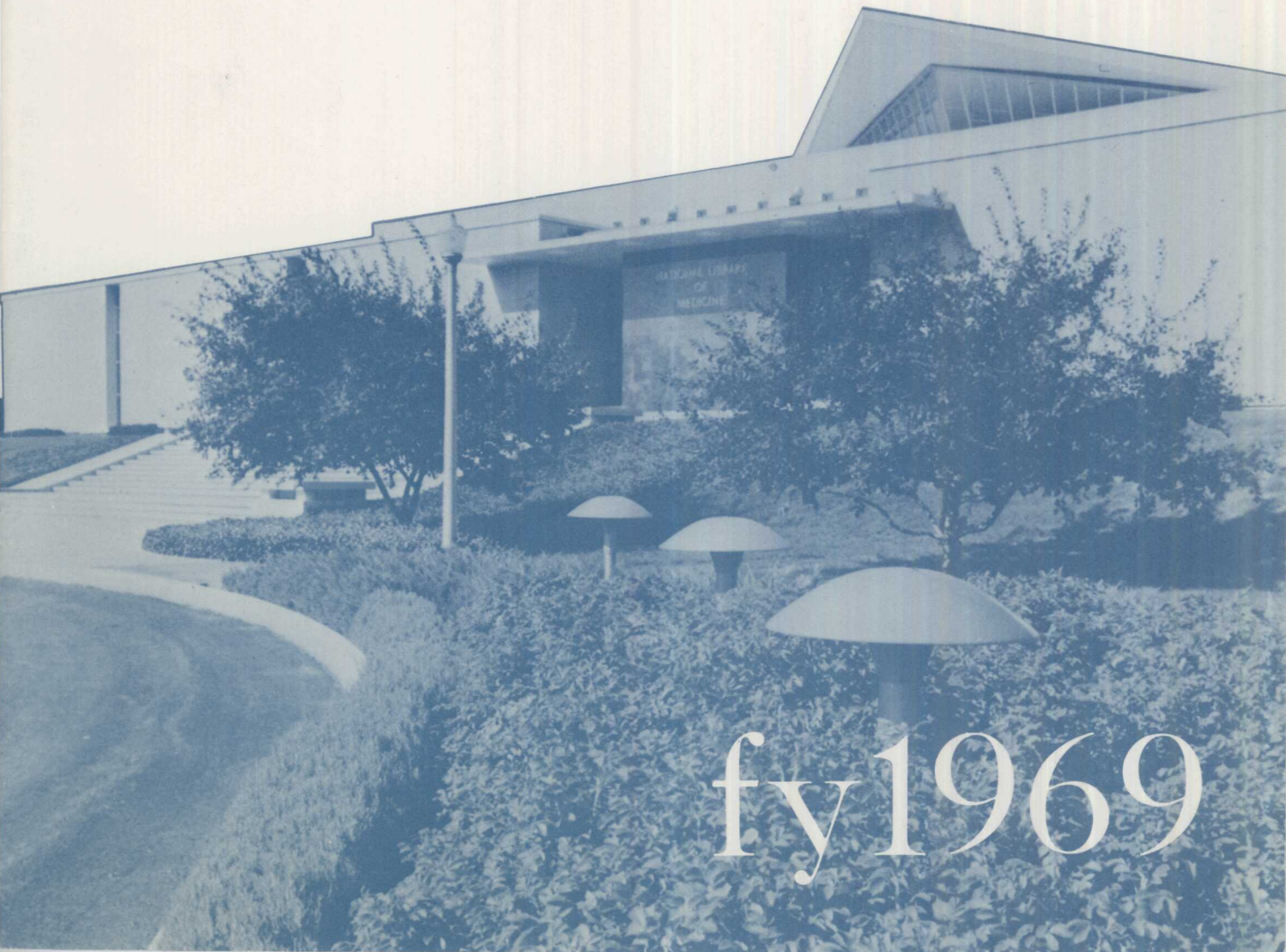


NATIONAL LIBRARY OF MEDICINE

# ANNUAL REPORT



fy 1969

**Annual Report  
for the  
Fiscal Year 1969**

**National Library  
of Medicine**

**8600 Rockville Pike  
Bethesda, Md. 20014**

# CONTENTS

Board of Regents.....	v
Introduction.....	vii
Office of the Director.....	1
Table of Organization.....	2
Library Operations.....	5
Office of Computer and Engineering Services.....	17
Specialized Information Services.....	19
National Medical Audiovisual Center.....	21
Lister Hill National Center for Biomedical Communications.....	25
Extramural Programs.....	29

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The Surgeon General  
U.S. Public Health Service

\* Term expired August 1968

## INTRODUCTION

The National Library of Medicine became a Bureau of the National Institutes of Health as a result of the reorganization of the Department of Health, Education, and Welfare in 1968. Within NIH it represents the field of communications in a biomedical triad of functions which include research and education. Our mission is to strengthen information services in support of the national health effort. The organizational transfer from the Office of the Surgeon General to NIH was relatively smooth, and present relationships with the other elements of the Federal community are strong.

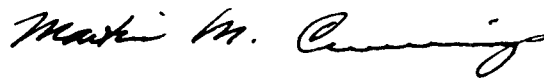
Our services to the medical community are being sustained at a high level despite losses of manpower resulting from the "Revenue and Expenditure Control Act of 1968." A prototype medical library network is functioning at the local, regional, and national levels of service. In large measure, the country is realizing good returns on its investment in local and regional medical libraries, which are now better prepared to satisfy the enormous appetite for information of health professionals throughout the nation. Strengthening these libraries has lessened pressures for interlibrary loan services directly from NLM.

To maintain society's ability to organize and use the knowledge it has generated will require the most sophisticated apparatus li-

braries can devise or invent. I fully expect the NLM to retain its position of leadership, but the task will demand more ingenuity and effort than ever before.

The Library's administration is augmented by the patient and astute advice provided to NLM by its Board of Regents—whose keen insight into our problems has allowed them to interact with the staff in seeking long-range solutions. These, I believe, will be reflected in major innovations in information services to the biomedical community during the years ahead.

No administrator of a large complex institution such as NLM can provide effective, comprehensive management without the support of an energetic and devoted staff. I have been blessed with such a dynamic and creative group of associates. Thus, the record of careful planning, innovations, and improved production which follows in the text of this annual report should be viewed as the contribution from all elements of the Library. Particularly, I wish to acknowledge the sustained contributions of Scott Adams, Deputy Director of NLM, who retires from the Library after 24 years of devoted Federal service. His presence will be missed sorely, but his influence on the library and its services will be evident for years to come.



Martin M. Cummings, M.D.  
Director  
National Library of Medicine

## OFFICE OF THE DIRECTOR

The Office of the Director has the responsibility to direct and coordinate all Library activities, study needs in biomedical communications, and advise NIH and HEW on policy relating to the management and control of biomedical communications media. The Director is assisted in this role by the NLM Board of Regents; by the Office of Administrative Management, which provides management and administrative services to the Library; the Office of Public Information and Publications Management, which interprets NLM programs for the biomedical community and the general public; and by the Management Staff of the Medical Literature Analysis and Retrieval System II (MEDLARS II) an advanced information retrieval system which will replace MEDLARS I by FY 1971. MEDLARS II will be a much-expanded system allowing for faster and more efficient computer-based access to biomedical literature files. To assure capacity for storage of a larger data base, an I.B.M. 360-50 has been installed and will gradually replace the Honeywell computers now employed by MEDLARS I.

During Fiscal Year 1969 the Office of the Director:

- achieved agreements with the National Institute of Health and Medical Research (I.N.S.E.R.M.) in France and the National Library of Australia and the University of Sydney for additional decentralized MEDLARS centers
- was represented at the III International Congress of Medical Librarianship held in Amsterdam in May 1969, where the Deputy Director was one of two honorary presidents
- provided continuing assistance to the development of the PAHO Regional Medical Library in São Paulo, Brazil
- integrated successfully NLM budget formulation, execution, and accounting procedures and operations into the NIH financial management system
- established formal organization of the Lister Hill National Center for Biomedical Communications
- arranged tours for over 2,500 visitors, including guests from 35 foreign countries
- displayed exhibits in the NLM lobby on blood transfusion, radioisotopes in medicine, and the genetic code, the latter featuring the work of Nobel Laureate Dr. Marshall Nirenberg
- sent out portable exhibits and publications for display at 34 locations in the U.S. and abroad
- distributed 23,005 copies of Literature Searches (computer-produced bibliographies which are reprinted for wide distribution) to 5,010 requesters.

**ORGANIZATION CHART FOR THE NATIONAL LIBRARY OF MEDICINE**

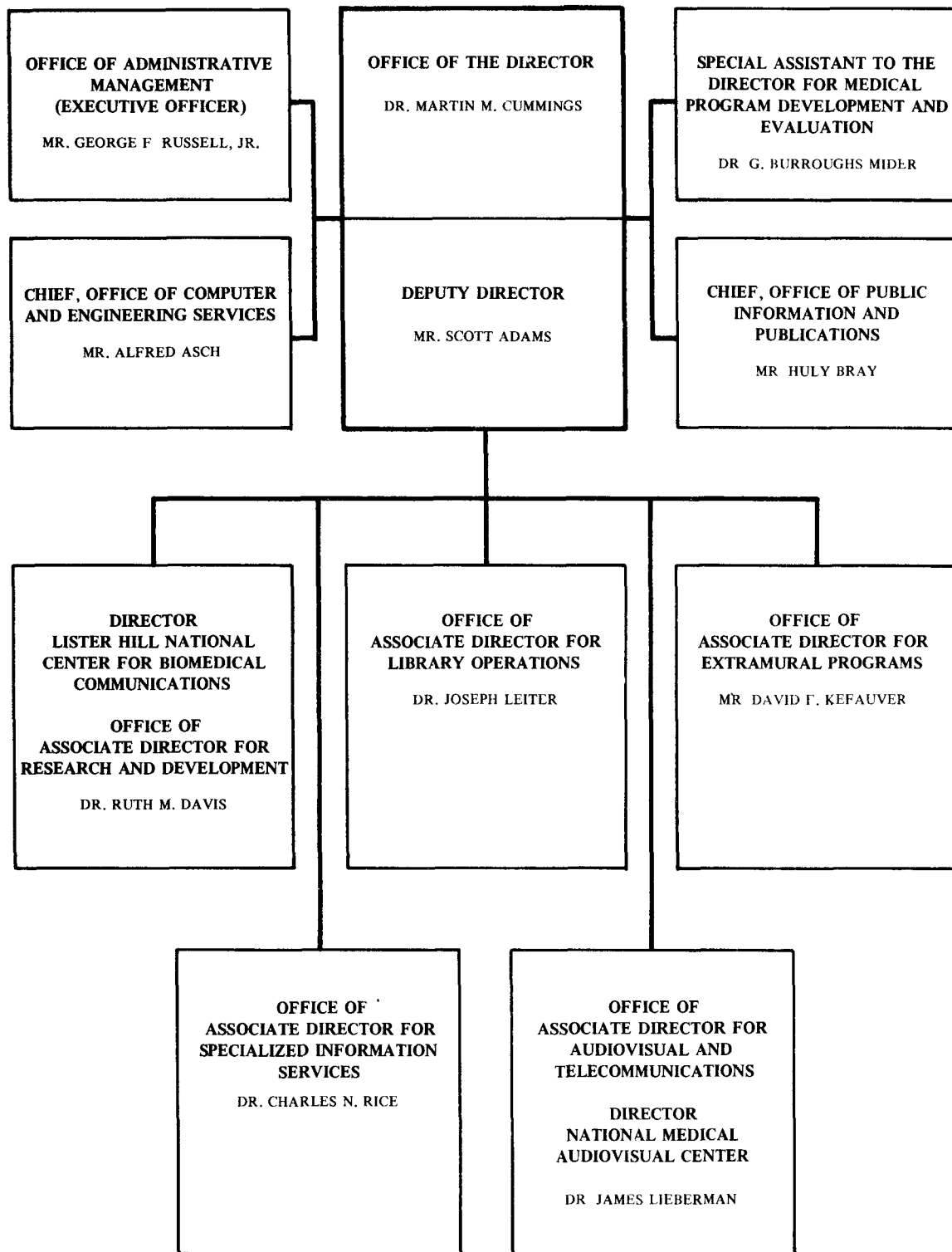


Fig. 1

## Financial Resources and Allocations, FY 1969

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<b>TOTAL AVAILABLE FOR OBLIGATION, FY 1969</b>	
Appropriation, NLM .....	\$18,160,500
less grant funds carried forward .....	—700,000
Brought forward from 1968 .....	4,117,462
Recovered from prior years .....	221,077
Earned reimbursements .....	436,000
<b>Total</b> .....	<b>22,235,039</b>
 <b>AMOUNT OBLIGATED BY PROGRAM, FY 1969</b>	
<b>EXTRAMURAL GRANTS</b>	
Construction .....	1,250,000
Training .....	1,310,039
Special scientific projects .....	85,413
Research .....	1,321,000
Resources .....	2,800,000
Regional medical libraries .....	2,088,000
Publications support .....	300,000
<b>Subtotal, grants</b> .....	<b>9,154,452</b>
 <b>DIRECT OPERATIONS</b>	
Library Operations .....	3,983,829
Office of Computer and Engineering Services .....	2,336,893
Toxicology Information .....	1,380,462
National Medical Audiovisual Center .....	2,350,174
Lister Hill National Center for Biomedical Communications .....	827,942
Review and Approval of Grants and Contracts .....	594,819
Program Direction .....	1,543,878
<b>Subtotal, direct operations</b> .....	<b>13,017,997</b>
<b>TOTAL, NATIONAL LIBRARY OF MEDICINE</b> .....	<b>\$22,172,449</b>
 <b>TOTAL AVAILABLE FOR OBLIGATION FOR REPAIRS AND IMPROVEMENTS, FY 1969</b> .....	
	<b>\$ 75,000</b>
 <b>TOTAL OBLIGATED FOR REPAIRS &amp; IMPROVEMENTS, FY 1969</b> .....	
	<b>\$ 40,720</b>

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Fig. 2



### Personnel

PERSONNEL ON DUTY (JUNE 30)	FY 67	FY 68	FY 69
OFFICE OF THE DIRECTOR.....	11	11	14
PUBLIC INFORMATION AND PUBLICATIONS.....	9	10	7
OFFICE OF ADMINISTRATIVE MANAGEMENT.....	29	36	35
OFFICE OF COMPUTER AND ENGINEERING SERVICES.....	36	49	55
EXTRAMURAL PROGRAMS.....	33	34	30
LISTER HILL NATIONAL CENTER FOR BIOMEDICAL COMMUNICATIONS.....	1	10	12
SPECIALIZED INFORMATION SERVICES.....	10	18	18
NATIONAL MEDICAL AUDIOVISUAL CENTER.....	—	105	105
LIBRARY OPERATIONS.....	204	201	196
Immediate Office of Associate Director.....	(9)	(10)	(8)
Bibliographic Services Division.....	(51)	(47)	(49)
Technical Services Division.....	(56)	(56)	(55)
Reference Services Division.....	(69)	(70)	(67)
History of Medicine Division.....	(19)	(18)	(17)
TOTAL FULL-TIME PERMANENT POSITIONS BUDGETED.....	333	474	472
TOTAL FULL-TIME PERMANENT AUTHORIZED AND BUDGETED.....	397	536	470

Other Full-time Personnel: FY 68, 22; FY 69, 17.

Fig. 3

# LIBRARY OPERATIONS

The Library Operations (LO) program acquires, indexes, and catalogs the ever-growing mass of biomedical publications, and provides loan, reference, and search services to meet the increasing demand for access to the material. The range of these operations is broad, covering both historical and current literature. The program uses conventional approaches as well as modern computer techniques, and it coordinates activities within NLM and the growing number of local and regional libraries which make up the existing national biomedical communications network.

## MEDLARS/NETWORK OPERATIONS

In recent years, LO has been developing a network arrangement through which MEDLARS (Medical Literature Analysis and Retrieval System) and interlibrary loan service can be shared more efficiently by other libraries. In the U.S., the network now consists of eleven MEDLARS stations and eight Regional Medical Libraries (see page 14). The Regional Medical Libraries (RML's), in addition to offering interlibrary loans, also provide bibliographic and reference services based on NLM's MEDLARS files. Four MEDLARS stations are now operating abroad: (1) National Lending Library of Science and Technology, Boston Spa, Yorkshire, England; (2) Karolinska Institutet, Stockholm, Sweden; (3) National Institute of Health and Medical Research (I.N.S.E.-R.M.), Paris, France; and (4) National Library of Australia, Canberra.

The activation of new Regional Medical Libraries and the organization of additional overseas MEDLARS centers created a need for expansion of training efforts. The MEDLARS Analyst Training Program was revised and broadened. Materials were also developed for one-day orientation sessions for physicians, scientists, librarians, and other MEDLARS users. To train staff in their presentation, the programs were

offered to a series of professional user groups. Users who participated in the sessions have reacted enthusiastically, and indicated that the sessions gave them background for more intelligent and effective interaction with MEDLARS.

In May 1969, to enhance communication between NLM and members of the network, Library Operations began issuing a monthly *MEDLARS/Network Technical Bulletin*.

The many aspects of operating a large-scale system like MEDLARS are reflected in the number of Library divisions and subdivisions responsible for its functioning. The Bibliographic Services Division (BSD) of Library Operations is the central point for MEDLARS services, since the system was developed primarily to improve the quality and speed with which bibliographies are generated. BSD coordinates the production of a growing number of recurring and non-recurring bibliographies for publication by both NLM and/or outside organizations. Library Operations works with the Office of Computer and Engineering Services (OCES), which processes the various MEDLARS searches formulated at NLM (either for an individual or for publication); and with the MEDLARS II Project Officer, who is responsible for development and implementation of MEDLARS II.

## BIBLIOGRAPHIC SERVICES DIVISION

Bibliographic Services Division (BSD) indexes the periodical literature of medicine, prepares *Index Medicus* and other published indexes, and formulates requests for computer searches (see Fig. 4).

### Indexing

During FY 1969, about 210,000 articles were indexed for MEDLARS, an increase of nine percent over the previous record production in FY 1968. (The index data base by the end

of the year approached one million.) Fifty-three percent of the indexing was performed under contracts and cooperative agreements with external agencies. Keio University, Tokyo, Japan, for example, provided indexing for 133 Japanese journals. The indexing backlog, equal to nearly five months' indexing capacity at the beginning of the year, was reduced to slightly over three months' capacity. With the exception of the German and Russian literature, journals were being indexed on a current basis by the end of the year. During the year, NLM began to receive indexing of the French, British, and Swedish medical literature from the MEDLARS stations in those countries.

### Searching

Over 11,500 MEDLARS demand searches were carried out for domestic users, 50% more than during FY 1968. A new MEDLARS search center became operational at the University of Washington in Seattle. The number of demand searches formulated by NLM staff rose from 2,500 to 3,000; however, because of a greater increase in the capacity of other centers, the proportion of all domestic searches formulated at NLM was reduced from 30% to 26%. The proc-

essing of this increased workload was made possible by the computer facilities at Ohio State University, the universities of Colorado and Alabama, and the Texas Medical Center, supplementing the NLM facility.

There has been a corresponding expansion of the MEDLARS search services provided to foreign users by cooperating foreign institutions. In FY 1969, 4,062 searches were performed, 40% more than in 1968. Overseas stations have placed increasing emphasis upon a regular selective dissemination of bibliographic citations, on a monthly basis, to regular subscribers to this service.

### Publications

The year 1969 marked the 90th anniversary of the *Cumulated Index Medicus (CIM)*. The 1968 *CIM* had 8,925 pages published in five volumes. It contained more than 207,000 citations, representing an increase of 15% over the 1967 *CIM*. Beginning with the January 1969 *Index Medicus*, a citation number is published with each citation in the name section of the monthly issues. This is expected to facilitate verification of inter-library loan requests; it will become especially important with the advent of a mechanized graphic image retrieval system.

### Bibliographic Services Division Activities

	FY 67	FY 68	FY 69
Journals Indexed in <i>Index Medicus</i> .....	2,279	2,246	2,260
Articles Indexed			
NLM.....	156,057	112,010	99,447
Other U.S.....	7,432	58,978	76,249
Foreign.....	4,821	21,935	34,906
Total.....	168,310	192,923	210,602
MEDLARS Searches Performed			
NLM.....	3,153	2,500	3,182
U.S. Centers.....	1,580	5,173	8,231
Foreign Centers.....	1,225	2,698	4,062
Total.....	5,958	10,371	15,475
Recurring Bibliographies.....	10	11	16
Literature Searches.....	11	25	38

Fig. 4

Five new Recurring Bibliographies began publication during the year. The *Index of Investigative Dermatopathology and Dermatology* is produced for publication by the Universities Associated for Research and Education in Pathology, Inc.; the *Recurring Bibliography of Hypertension*, for the American Heart Association; the *Cranio-Facial—Cleft Palate Bibliography*, for the American Cleft Palate Association; the *Current Bibliography of Epidemiology*, for the American Public Health Association; and the *Neurosurgical Biblio-Index*, for the *Journal of Neurosurgery* (see page 16).

Thirty-eight new Literature Searches (selected individual computer searches reprinted for wide distribution) were added to the list of available titles. These new bibliographies covered such timely subjects as "Adverse Effects of LSD," "Heart Transplantation," and "Toxicity of Pesticides to Man." Of 88 available Literature Searches, over 23,000 copies were distributed to requesting health professionals. This represents an increase of 20 percent over FY 1968.

## Medical Subject Headings

Because of the technical constraints of MEDLARS I, the number of new main headings introduced during the year was held to 87. However, extensive thought and effort were devoted to investigating the various approaches that MEDLARS II may offer for handling problems of expanding vocabulary. This work included continued efforts to reconcile the vocabularies used by specialized information centers with *Medical Subject Headings*.

## TECHNICAL SERVICES DIVISION

The Technical Services Division (TSD) selects, acquires, catalogs, and announces to the biomedical community the world's biomedical literature.

### Selection and Acquisition

In FY 1969 the Division obtained and processed for the collections 125,000 items—a record number (see Figs. 5, 6). Among these were materials acquired through participation in a PL 480 Program operated by the

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### Members of Committee on Selection of Literature for MEDLARS

Dr. William B. Bean (Chairman)  
Professor and Chairman  
Department of Internal Medicine  
University of Iowa School of Medicine

Mr. William K. Beatty  
Librarian  
The Archibald Church Medical Library  
Northwestern University

Mr. Harold J. Bloomquist  
Librarian  
The Francis A. Countway Library  
of Medicine

Miss Myrl L. Ebert  
Librarian  
Division of Health Affairs  
University of North Carolina

Dr. Morris Fishbein  
Chicago, Illinois

Dr. Franz J. Ingelfinger  
Editor, *New England Journal of Medicine*

Dr. John H. Talbott, M.D., Editor  
*Journal of the American Medical Association*

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Library of Congress. Under this program, the Library of Congress orders publications from a number of foreign countries, to be distributed to the National Library of Medicine, the National Agricultural Library, and the Center for Research Libraries.

TSD produced a revised working manual which describes the Library's current acquisitions policies in terms of subject, scope, and depth of coverage. It is used as a selection guide by both NLM selectors and book-dealers.

### Growth of Collections

	CURRENT YEAR			COLLECTION TOTALS	
	Added	With- drawn	Net Gain	June 30 1968	June 30 1969
<b>BOOK MATERIAL</b>					
1. Bound Monographs					
a. -1800-----	262	---	262	36,848	37,110
b. 1801-1913-----	127	---	127	88,719	88,846
c. 1914-----	7,300	346	6,954	212,846	219,800
Subtotal (1)-----	7,689	346	7,343	338,413	345,756
2. Bound Serials-----	12,322	219	12,103	337,038	349,141
3. Unbound Issues, Volume Equiv- alents-----	-----	---	-----	15,000	17,000*
Total Bound Volumes (1+2+3)-----	20,011	565	19,446	690,451*	711,897
4. Theses-----	6,444	---	6,444	303,744	310,188
5. Pamphlets-----	776	---	776	170,438*	171,214
Subtotal (4+5)---	7,220	565	7,220	474,182*	481,402
<b>TOTAL BOOK         MATERIAL---</b>	<b>27,231</b>	<b>565</b>	<b>26,666</b>	<b>1,164,633*</b>	<b>1,193,299</b>
<b>NON-BOOK MATERIAL</b>					
1. Microfilms (Archival Film on Reels)----	2,417	---	2,417	8,268	10,685
2. Microfiche-----	1,641	---	1,641	---	1,641
3. Pictures-----	2,286	---	2,286	64,444	66,730
<b>TOTAL NON-         BOOK         MATERIAL---</b>	<b>6,344</b>	<b>---</b>	<b>6,344</b>	<b>72,712</b>	<b>79,056</b>
<b>GRAND TOTAL---</b>	<b>33,575</b>	<b>565</b>	<b>33,010</b>	<b>1,237,345*</b>	<b>1,272,355</b>

\* Revised Figures.

Fig. 5

## Cataloging

TSD cataloged over 15,000 titles (see Fig. 7), which were announced in biweekly issues of the *National Library of Medicine Current Catalog*, and in its cumulative quarterly and annual issues.

During the year, the Division experimented with issuance of cataloging proof-sheets twice a week to speed transmission of data to users. Response was favorable and plans are being made to issue the semiweekly proof-sheets to a wider audience.

The Division also implemented a cooperative cataloging program with the Francis A. Countway Library at Harvard and the State

University of New York Upstate Medical Library at Syracuse (SUNY). The program is operated with the use of on-line terminals to the computer base at SUNY. Original cataloging by Countway and SUNY is now being announced in the *NLM Current Catalog*, with appropriate location symbols. This is the first step toward a national union catalog of biomedical literature.

TSD completed the consolidation of NLM serial records, so that all information about each title is now contained on a single form. Automation of serial handling at NLM, planned for MEDLARS II, can proceed from this foundation.

<b>Acquisition Activities</b>			
	1967	1968	1969
<b>SEARCHING</b>			
Prospects Considered for Acquisition, Not in Library-----	29,607	14,209*	22,015
Prospects Considered for Acquisition, Library Has -----	9,812	11,997*	5,855
TOTAL-----	39,419	26,206*	27,870
ORDERS PLACED-----	14,552	5,025	5,670
<b>SERIAL RECORD</b>			
New Titles Added-----	1,168	1,299	1,847
Titles Currently Received (as of end of year)-----	19,650	21,066*	22,918
<b>PUBLICATIONS PROCESSED</b>			
Serial Pieces-----	88,907	88,757	96,920
Other-----	23,394	27,698	27,353
TOTAL PUBLICATIONS PROCESSED -----	112,301	116,455	124,273
<b>OBLIGATIONS FOR PUBLICATIONS</b>			
PUBLICATIONS-----	209,900	204,300	286,398
(Included for Rare Books)-----	31,095	23,564	41,353
* Corrections.			

Fig. 6

### Cataloging Statistics

	1967	1968	1969
Completed Cataloging			
New Titles.....	13,841	14,450	14,273*
Recataloged Titles.....	688	1,253	1,253
TOTAL.....	14,529	15,703	15,526
Volumes Reclassified and/or Transferred.....	2,598	1,070	1,582
Catalog Cards Filed.....	124,224	114,256	119,904
Volumes Shelved.....	15,813	13,006	10,380

\* Includes 1,402 SUNY & Countway Titles.

Fig. 7

## REFERENCE SERVICES DIVISION

This Division provides reference and reader service to users at the Library, and inter-library loan service to the biomedical community through the Regional Medical Library Network. It also preserves and maintains the collection of library materials published from 1871 to date.

### Reference and Reader Services

The Reference Services Division (RSD) answered over 24,000 reference inquiries during FY 1969 (see Fig. 8). Some 1,300 were received by mail; half of the remainder came by telephone, and half directly from users at the Library. Reference librarians also completed the following reference works, which have been or are to be published:

- First supplement to *Medical Reference Works 1679–1966*
- Searching the Neoplastic Literature, A Guide to Selected Reference Tools and*

### *other Publications*

- Research Institutes Named for Medical Men*
- Graphic Presentation of Selected Indexes and Abstracts in Biomedicine*
- International List of Medicolegal Serials 1736–1967*

RSD registered over 7,800 different individuals using the Reading Room in FY 1969. These users requested over 90,000 items for use in the Library. In addition, television tapes on biomedical subjects were made available to users through videotape consoles located in the Reading Room.

### Interlibrary Loan

The Division filled over 117,000 interlibrary loan requests (see Fig. 9). Photocopy of journal articles was furnished in most instances, in lieu of lending the original volume. RSD initiated special service to libraries in the Mid-Atlantic Region, and

### Reference Services

	1967	1968	1969
Requests by Telephone.....	11,636	11,871	11,698
Government.....	(5,731)	(5,432)	(5,500)
Non-government.....	(5,905)	(6,439)	(6,198)
Requests by Mail.....	1,418	1,300	1,322
Government.....	(221)	(196)	(161)
Non-government.....	(1,197)	(1,104)	(1,161)
Readers Assisted.....	12,460	11,580	11,185
Government.....	(4,453)	(3,639)	(3,795)
Non-government.....	(8,007)	(7,941)	(7,390)
TOTAL.....	25,514	24,751	24,205
Government.....	(10,405)	(9,267)	(9,456)
Non-government.....	(15,109)	(15,484)	(14,749)
Readers Counted.....	31,666	31,671	27,303

Fig. 8

### Circulation Statistics

	1967	1968	1969
Requests received.....	278,580	261,938	234,666
Requests filled.....	239,857	220,633	199,461
Requests unfilled.....	38,723	41,305	35,205
Rejected.....	(3,446)	(6,290)	(7,510)
Not available.....	(35,277)	(35,015)	(27,695)
Percentage of requests filled *.....	87.2%	86.3%	87.8%

#### ITEMS USED BY MAJOR CATEGORY

Reader requests.....	91,622	93,794	82,412
Interlibrary Loans.....	148,235	126,839	117,049
Photocopy.....	(141,230)	(120,021)	(110,573)
Original.....	(7,005)	(6,818)	(6,476)

\* Based on total number of requests accepted (receipts less rejections).

Fig. 9



### Binding Statistics

	1967	1968	1969
Volumes sent to binder.....	19,177	16,986	16,650
Volumes returned from binder and processed.....	18,072	18,022	15,606
New volumes.....	(15,972)	(16,630)	(14,805)
Rebinds.....	(2,100)	(1,392)	(801)
Volumes bound at NLM.....	5,005	4,858	6,330
Volumes repaired at NLM.....	4,227	4,314	4,787
Volumes and pieces lettered.....	16,874	13,869	12,285
Pieces mounted.....	52	0	0

### Microrecords Statistics

	1967	1968	1969
Volumes collated.....	3,746	3,986	2,925
Pages edited.....	1,078,910	1,294,209	1,089,831
Reels of film accepted.....	1,777	1,534	2,338

Fig. 10

began experimental use of facsimile transmission in forwarding loan requests. The Division also developed equipment and film specifications for a new Graphic Image System. This system will allow for the storage and automated retrieval of microfilmed journal articles, with automatic preparation of enlargement prints of requested articles, to fill selected interlibrary loan requests.

#### **Maintenance and Preservation of the Collection**

In FY 1969, RSD:

- completed a shift of the bound-journal collection to provide quicker access to the most heavily used journals
- bound almost 23,000 journal and monograph volumes
- microfilmed to archival standards over 3,250,000 pages of deteriorating and irreplaceable library material.
- established and organized an archival film collection in a controlled-environment film vault.

#### **Photographic Support Activities**

In addition to interlibrary loan and preservation filming, the Division filmed and processed over 340,000 catalog cards and processed 100,000 photocomposed index pages, and made almost 2,600 photographs and slides.

#### **HISTORY OF MEDICINE DIVISION**

The History of Medicine Division (HMD) develops, organizes, and services the Library's original source materials for study and research in the history of medicine and related sciences. It prepares catalogs, bibliographies, and works of independent historical scholarship. The Division has custody of manuscripts, prints, and illustrations and all publications in the Library's possession that were issued prior to 1871.

#### **Public Service**

During FY 1969, HMD provided almost 5,000 books, manuscript boxes, and microfilm reels

to readers in the Library. It filled over 2,200 requests for photocopies and interlibrary loans. HMD supplied 1,400 photographs and slides in response to requests for pictorial material, and answered more than 1,600 reference requests.

### Acquisitions

HMD added 456 volumes to the historical collections, including three incunabula, 85 sixteenth-century imprints, and 14 early American imprints. It generated 83 hours of tape-recorded and transcribed "oral history" interviews, including 33 hours taped by the one staff interviewer; the remainder were acquired under contract and through a gift. Additions included 23,000 manuscript items, plus six microfilm reels of Billings and Beau-

mont papers, and about 2,300 prints and photographs.

### Publications and Research

The third issue of the *Bibliography of the History of Medicine* appeared in FY 1969 and the manuscript for the next issue was virtually completed. The Hafner Publishing Company published *Education in the History of Medicine*, the report of a conference held at NLM and edited by Dr. John Blake. To improve access to the collection, and as a necessary step toward the future publication of catalogs, HMD cataloged 800 fifteenth- and sixteenth-century imprints and 584 serial titles. Staff members submitted manuscripts of two books and ten articles for publication.

<b>History of Medicine Division</b>			
<b>Annual Statistics</b>			
	1967	1968	1969
<b>ACQUISITIONS</b>			
Books.....	549	382	456
Early Manuscripts.....	149	237	25
Modern Manuscripts.....	25,755	41,431	23,250
Oral History Hours.....	85	58	83
Prints and Photographs.....	2,362	1,581	2,286
<b>PROCESSING</b>			
Titles Cataloged.....	1,809	1,166	1,384
Entries Established (18th c.).....	1,604	1,555	1,068
Early Manuscripts Cataloged.....	2,394	2,123	182
Modern Manuscripts Cataloged.....	44,300	41,226	39,831
Pictures Indexed.....	3,637	1,512	486
Articles Indexed.....	2,680	4,295	4,620
Pages Microfilmed.....	141,147	126,678	139,003
<b>PUBLIC SERVICE</b>			
Reference Questions Answered.....	1,734	2,041	1,652
ILL and Pay Orders Filled.....	707	2,533	2,234
Reader Requests Filled.....	3,193	5,215	4,742
Pictures Supplied.....	1,656	1,910	1,409

Fig. 11

Following are (1) a list of MEDLARS service centers and (2) a list of MEDLARS products.

### List of Regions and MEDLARS Service Centers

Regions	States	Service Centers
1—New England	Conn., Me., Mass., N.H., R.I., Vt.	New England Regional Medical Library, The Francis A. Count- way Library of Medicine 10 Shattuck St. Boston, Mass. 02115
2—New York	N.J. (the eleven northern coun- ties), N.Y.	MEDLARS Management Sec- tion National Library of Medicine 8600 Rockville Pike Bethesda, Md. 20014
3—Mid-Eastern	Del., N.J. (the ten southern coun- ties), Pa.	Mid-Eastern Regional Library College of Physicians of Philadelphia Library 19 South 22nd St. Philadelphia, Pa. 19103
4—Mid-Atlantic	D.C., Md., N.C., Va., W.Va.  NIH Staff	Mid-Atlantic Regional Medical Library P.O. Box 30260 Bethesda, Md. 20014  NIH Library MEDLARS Center, Bldg. 10, Rm. 1L13 Bethesda, Md. 20014
5—East Central	Mich.  Ky., Ohio  Mich., Ohio, Ky.	MEDLARS Center University of Michigan 3490 Kresge Medical Re- search Bldg. Ann Arbor, Mich. 48104 MEDLARS Center, Health Center Library, Ohio State University College of Medicine 1645 Neil Ave. Columbus, Ohio 43210 Regional Medical Library (KOM) Wayne State University 645 Mullett St. Detroit, Mich. 48226

(continued)

6—Southeastern	Ala., Fla., Ga., Miss., Puerto Rico, S.C., Tenn.	MEDLARS Center, Medical Center Library, University of Alabama 1919 Seventh Ave. South Birmingham, Ala. 35233
7—Midwest	Ill., Ind., Iowa, Minn., Wis.	Midwest Regional Medical Library The John Crerar Library 35 West 33rd St. Chicago, Ill. 60616
8—Midcontinental	Colo., Kan., Mo., Nebr., N.D., S.D., Utah, Wyo.	MEDLARS Center, Denison Memorial Library, Uni- versity of Colorado Medi- cal Center 4200 East Ninth Ave. Denver, Colo. 80220
9—South Central	Ark., La., N.M., Okla.  Texas	MEDLARS Management Sec- tion National Library of Medicine 8600 Rockville Pike Bethesda, Md. 20014 MEDLARS Center, Texas Medical Center Jesse H. Jones Library Building Houston, Tex. 77025
10—Pacific Northwest	Alaska, Idaho, Mont., Oreg., Wash.	Pacific Northwest Regional Health Sciences Library University of Washington Seattle, Washington 98105
11—Pacific Southwest	Ariz., Calif., Hawaii, Nev.	MEDLARS Center, Bio- medical Library Center for the Health Sciences University of California Los Angeles, Calif. 90024
PMA	Membership	Pharmaceutical Manufacturers Association 1155 15th St., N.W. Washington. D.C. 20005

## MEDLARS Products

as of June 30, 1969

1. *Index Medicus* (Monthly)
2. *Cumulated Index Medicus* (Annual)
3. *Bibliography of Medical Reviews* (Monthly—Annual)
4. *List of Journals Indexed in Index Medicus* (Annual)
5. *Medical Subject Headings* (Annual—three interim issues)
6. *NLM Current Catalog* (Biweekly—Cumulative Quarterly)
7. *Anesthesiology Bibliography* (Bimonthly)  
Cooperating Organization: Wood Library-Museum of Anesthesiology
8. *Artificial Kidney Bibliography* (Quarterly)  
Cooperating Organization: National Institute of Arthritis and Metabolic Diseases, National Institutes of Health
9. *Cerebrovascular Bibliography* (Quarterly)  
Cooperating Organizations: National Heart Institute, and National Institute of Neurological Diseases and Stroke, National Institutes of Health
10. *Index to Dental Literature* (Cumulative Quarterly)  
Cooperating Organization: American Dental Association
11. *Endocrinology Index* (Bimonthly)  
Cooperating Organization: National Institute of Arthritis and Metabolic Diseases, National Institutes of Health
12. *Fibrinolysis, Thrombolysis & Blood Clotting* (Monthly—Annual)  
Cooperating Organization: Committee on Thrombolytic Agents, National Heart Institute, National Institutes of Health
13. *International Nursing Index* (Cumulative Quarterly)  
Cooperating Organization: American Journal of Nursing Co.
14. *Bibliography of Medical Education* (Monthly—Annual)  
Cooperating Organization: Journal of Medical Education
15. *Index of Rheumatology* (Monthly)  
Cooperating Organization: American Rheumatism Association
16. *Bibliography of Surgery of the Hand* (Quarterly—Annual)  
Cooperating Organization: American Society for Surgery of the Hand
17. *Toxicity Bibliography* (Quarterly)  
Cooperating Organization: Drug Literature Program, National Library of Medicine
18. *Current Bibliography of Epidemiology* (Monthly)  
Cooperating Organization: American Public Health Association
19. *Neurosurgical Biblio-Index* (Quarterly)  
Cooperating Organization: American Association of Neurological Surgeons
20. *Cranio-Facial—Cleft Palate Bibliography* (Quarterly)  
Cooperating Organization: American Cleft Palate Association
21. *Index of Investigative Dermatopathology and Dermatology* (Monthly)  
Cooperating Organization: Universities Associated for Research and Education in Pathology, Inc.
22. *Recurring Bibliography on Hypertension* (Bimonthly)  
Cooperating Organization: American Heart Association, Inc.

# OFFICE OF COMPUTER AND ENGINEERING SERVICES

The Office of Computer and Engineering Services (OCES) is responsible for supporting the Library's programs through technical planning, systems development, computer programming, and computer operations. It also provides technical assistance and computer-processing support to MEDLARS II Project Management Staff during the development and implementation phases of the second-generation MEDLARS.

## REORGANIZATION

On July 15, 1968, OCES integrated its systems analysis and application programming functions. This resulted in more efficient management and administration of OCES operations, and in an organization better able to provide orderly transition from MEDLARS I to MEDLARS II. In March 1969, the management of the MEDLARS II system was transferred from OCES to a new organization; the MEDLARS II Project Management Staff, which reports to the Director, NLM. This action permitted OCES to concentrate its manpower resources on the maintenance of MEDLARS I in order to cope with the increasing demands placed upon it; it also enabled the MEDLARS II Project Manager to achieve better management and coordination of the development effort.

## COMPUTER PROGRAMMING FOR MEDLARS I

The systems analyst/programmers participated extensively in the augmentation, modification, and maintenance of MEDLARS I to increase its processing capabilities. Among the additions and improvements to the system were (1) inclusion of a demand search restart capability, (2) initiation of semi-weekly processing of the *NLM Current Catalog*, (3) incorporation of multireel processing

in many of the Honeywell 800 programs, (4) renumbering and cross-reference listing of the master citation data file, and (5) creation of programs to enable the Library to use the Honeywell 200 computer as a free-standing system.

OCES participated in efforts toward the implementation of the Auxiliary Chemical Module (ACM). The ACM provides capability to input drug and chemical information to the master data base and subsequently retrieve it. The system will become operational during the first half of FY 1970. In addition, OCES helped to develop specifications for an Automated Inventory Control System for the National Medical Audiovisual Center, and later participated in the validation and evaluation of contractor proposals and selection of the contractor.

## COMPUTER UTILIZATION AND UPGRADING

### Operations

The Honeywell 800/200 computer system workload required the continuation of around-the-clock work shifts throughout the year. Additional computer time was purchased from the Army Map Service in order to meet the increasing processing requirements. A considerable amount of overtime had to be used throughout the year to enable both computer installations to be manned.

### Equipment

Significant additions were made to the existing Honeywell 800 computer, including a new paper tape reader, a high-speed printer, and two additional magnetic tape drives. In addition, all of the Flexowriter machines were completely overhauled, and more advanced models of several types of Electronic Accounting Machines received.

Intermittent malfunctioning of the Photon

900 photocomposing machine continued through the year despite overhaul of the film magazine in November 1968. The malfunctioning created serious problems in maintaining production deadlines. After careful study it was decided to retire the prototype GRACE (Graphic Arts Composing

Equipment) unit 900 and lease a later model, the 901 Zip, from Photon, Inc. During the fiscal year, the 901 was used to produce four issues of *Index Medicus* and 49 bibliographies. A total of 65,890 pages for NLM publications were produced on the Photon 900 and 901 equipment.

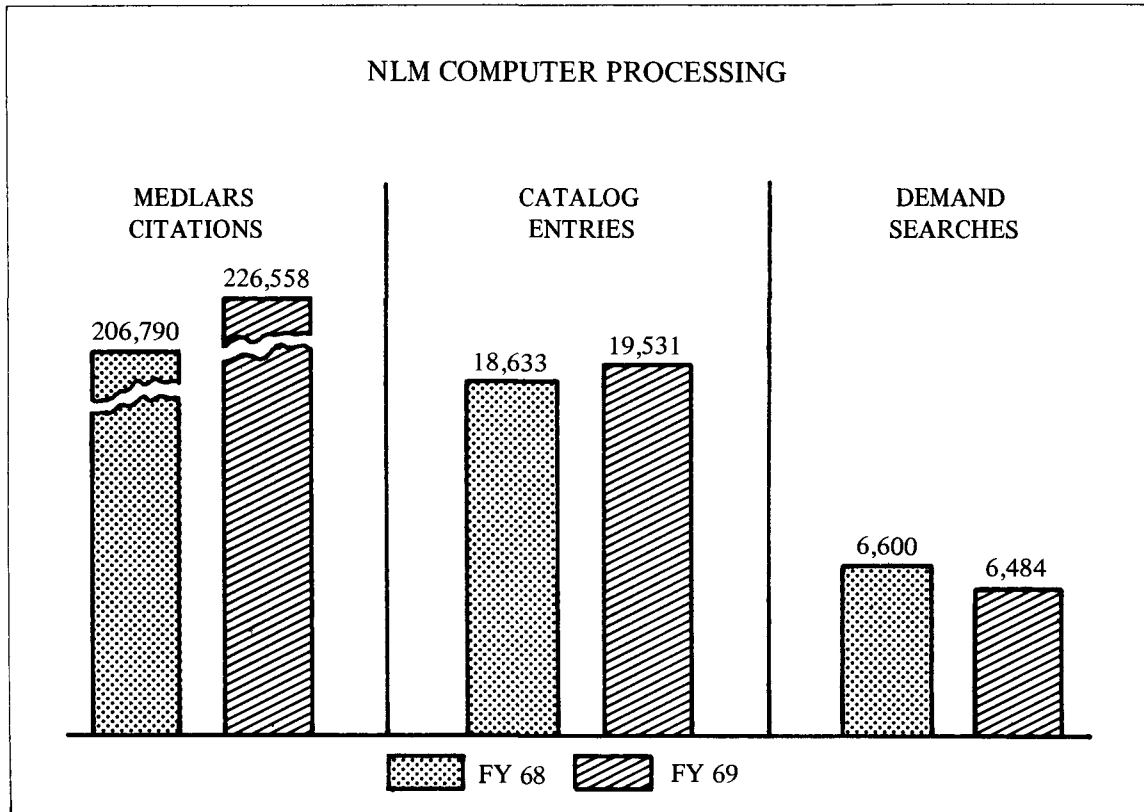


Fig. 12

## SPECIALIZED INFORMATION SERVICES

Specialized Information Services (SIS) was created by the Library in FY 1967 to meet a specific need for toxicologic information. While most Library activities are focused on general biomedical information, SIS, as its name implies, is concerned with special informational needs. To assist SIS with policy guidance, an advisory committee of the Division of Medical Sciences of the National Academy of Sciences, National Research Council, maintains contact with the professional, academic, and industrial communities.

### TOXICOLOGY INFORMATION PROGRAM (TIP)

A computer-based file is planned by TIP to furnish both inquiry and referral services. Processing must provide for superscripts, subscripts, special characters, and portions of the Greek alphabet. In FY 1969, efforts to meet these special requirements were initiated with assistance from the National Bureau of Standards. The computer programs being developed will allow for input from a variety of sources and devices, provide editing, and allow for output through a number of devices. Chemical Abstracts Service provides registry numbers and preferred names for chemicals in the TIP file. Although the file will provide toxicological data on all chemicals, the emphasis will be on pesticides.

With the aid of contractors, SIS is learning how working toxicologists use existing information systems. User interests and needs for products and services have been examined. Questionnaires, continually improved and updated by tests, interviews, and recommendations from both consultants and SIS staff, have received good responses from a selected audience. Data from these questionnaires will be used to further determine specific needs and how best to answer those needs.

Development of a roster of toxicology authorities continued during the year. This computerized file, broken down by areas of expertise, will be invaluable in meeting the needs of practicing health professionals.

*A Directory of Information Resources in the United States: Toxicology*, listing approximately 700 potential information resources, will be published in FY 1970 under agreement with the National Referral Center for Science and Technology, Library of Congress.

### DRUG LITERATURE PROGRAM

The Drug Literature Program of SIS is concerned with the published literature on drugs. It provides specifically for additions to the Library's collection, including unusual publications and all editions of such compendia as pharmacopoeias and codexes, special card services, etc.

In cooperation with the Library's Medical Literature Analysis and Retrieval System (MEDLARS), the section has worked toward improved handling of drug literature through extension of journal coverage and revision of terminology in such areas as autonomic drugs and toxicology terminology. This work has been carried out in cooperation with the American Society for Pharmacology and Experimental Therapeutics, and the Society of Toxicology. Expanded programs are being considered in the areas of pharmacy and molecular biology.

During FY 1969 SIS took several major steps toward phased implementation of chemical indexing from MEDLARS: staff reviewed registry data tapes received from Chemical Abstracts Service; eliminated some machine-assigned MeSH terms by overriding, when the number of terms was excessive or terms were unsatisfactory; completed input typing and journal indexing tests; tested input programs with items created in the



input typing tests; and prepared input for testing programs of the Office of Computer and Engineering Services for file maintenance. By the end of the year a modest start had been made toward chemical indexing for MEDLARS.

After its meeting in March, the Autonomic Drugs Panel planned to report on its project to help the scientific community understand the autonomic drug classification. This report will illustrate problems in reaching agreement on a single classification, as well as problems in applying that classification to a standardized vocabulary for use in a controlled indexing system.

The Toxicology Terminology Panel worked on environmental health terms to be included in a subcategory of *Medical Subject Headings*. Continued interest in drug interactions led to a contract to develop a retrospective bibliography, 1938-68. The Library appointed an advisor to assist SIS with the clinical pharmacologic aspects of the bibliography and other matters related to drug interactions.

Subscriptions for the *Toxicity Bibliography* continued to increase. A revised announcement of the publication was distributed through the Council of Biology Editors.

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#### Ad Hoc Committee on Nomenclature of Autonomic Drugs

Edward W. Pelikan, M.D. (Chairman)  
Department of Pharmacology and  
Experimental Therapeutics  
Boston University  
School of Medicine

Sydney Ellis, Ph.D.  
Department of Pharmacology and Toxicology  
University of Texas  
Medical Branch

John P. Long, Ph.D.  
College of Medicine  
Department of Pharmacology  
State University of Iowa

Robert L. Volle, Ph.D.  
Department of Pharmacology  
University of Connecticut

---

#### Ad Hoc Committee on Toxicology Terminology

Henry F. Smyth, Jr., Ph.D. (Chairman)  
Delmont, Pennsylvania

Gabriel L. Plaa, Ph.D.  
Department of Pharmacology  
Faculty of Medicine  
University of Montreal

Fredric Rieders, Ph.D.  
Office of the Medical Examiner  
Department of Public Health  
Philadelphia, Pennsylvania

Bert T. Vos, Ph.D.  
Division of Pharmacology and Toxicology  
Bureau of Science  
Food and Drug Administration

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#### Consultants

Jerome Cornfield  
Graduate School of Public Health  
University of Pittsburgh

John T. Litchfield, Jr., M.D.  
Heathsville, Virginia

# NATIONAL MEDICAL AUDIOVISUAL CENTER

The National Medical Audiovisual Center (NMAC) has been a part of the National Library of Medicine for two years. NMAC serves the medical community through: (1) a specialized audiovisual production program; (2) consultant and advisory services to schools and institutions of the health sciences; and (3) national distribution of audiovisuals.

Over 79,000 audiovisuals were distributed in fiscal year 1969; about 16,000 additional requests for instructional materials had to be turned down because of budgeting and staffing restrictions.

Productions completed during the year included 31 motion pictures, 50 television productions, and 32 filmstrip and slide series. Over 5,000 audiovisual units were acquired for the several collections housed at NMAC, including those added to the distribution system for circulation.

This year, NMAC provided more than 200 consultations, surveys, seminars, workshops, and presentations for schools and institutions of the health professions. Among these is a comprehensive program with the Veterans Administration to establish learning centers in selected VA hospitals.

A staff member of the Department of Medical Education, Hebrew University—Hadasah Medical School, Jerusalem, spent approximately ten weeks in orientation at NMAC for the initial phase of a communications project (authorized by Public Law 480) involving both institutions. The Director, NMAC, visited that institution to plan for project implementation and to conduct special seminars for faculty and staff.

## BRANCH PROGRAMS

### Production

A television series, *Concepts and Controversies*

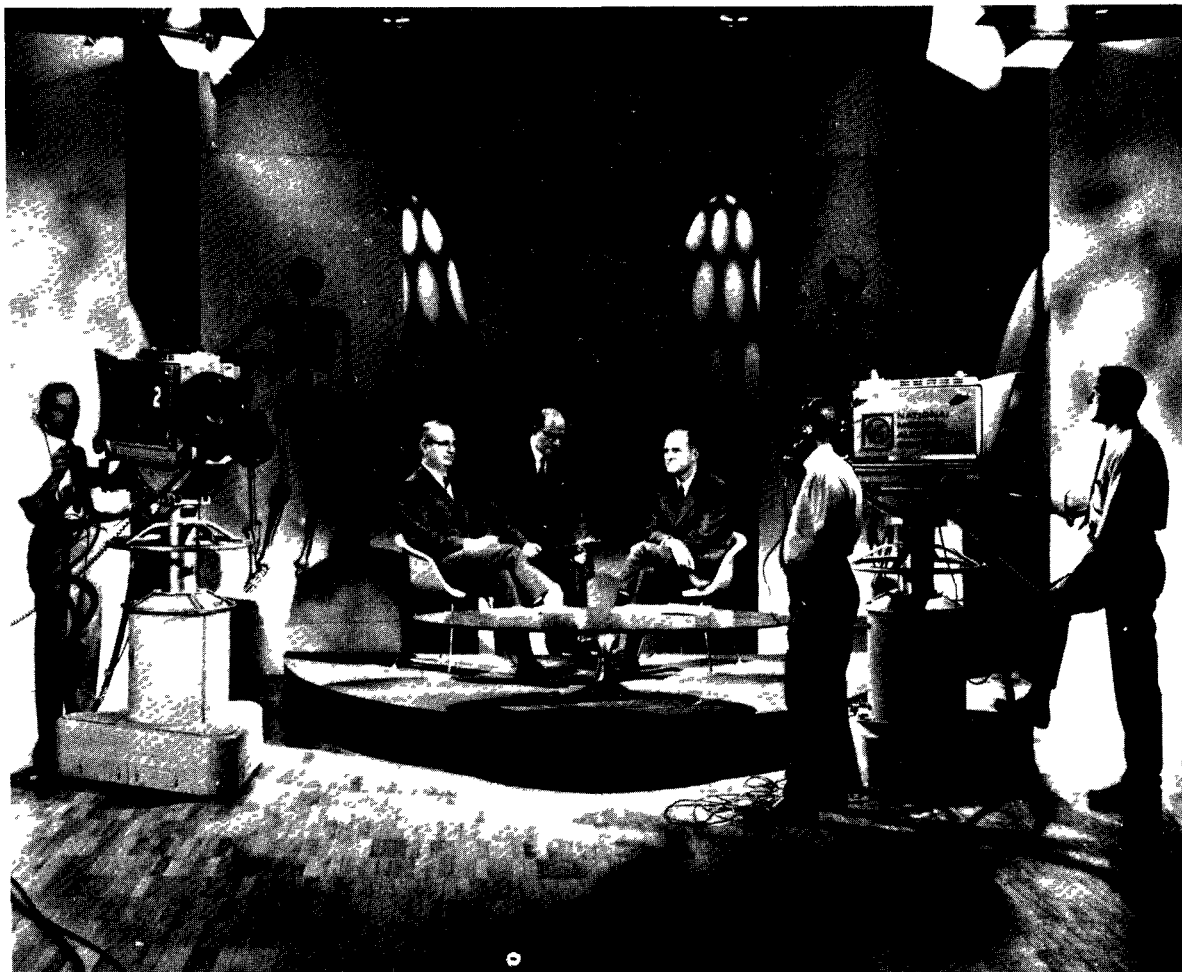
*in Modern Medicine*, was initiated, with programs on current smallpox vaccination practices in the United States, rheumatoid arthritis, therapeutic abortion, and therapy for narcotic addiction. In each of these programs, two renowned authorities on the selected subject give opposing viewpoints on a recognized medical controversy, and a moderator represents the viewpoint of numerous other practicing physicians. The series is designed for use in medical schools and other physician education programs.

A series of television teaching programs on clinical pathology was started during FY 1969 with the technical advice of Dr. Norman Ende, Professor of Pathology, School of Medicine, Emory University and Director of Laboratories, Grady Memorial Hospital. Approximately 20 programs in the series have been transferred to film and are available for distribution. Recently completed productions include: *Clinical Pathologic Correlations of Enzymology*, Parts 1, 2, 3, and 4; *Pulmonary Mycoses*, Part 1 (*Blastomycosis*); *Endocrinologic Aspects of Amenorrhea*; and *Platelet Morphology Function*.

Two newly produced filmstrips are (1) a three-part series on human reproduction, for family planning programs, and (2) *Basis of Diagnosis of Peripheral Nerve Injuries to the Upper Limb*, for use in neurology teaching programs.

Completed during the fiscal year were four television spot announcements and a 13½-minute motion picture promoting Rubella vaccine and also designed for television. The films, featuring stars of motion pictures and television, were produced to support the nationwide effort to eradicate Rubella.

Other motion pictures completed were *After the Smoke Clears* (air pollution), *A Man Named Joe* (psychiatry), and *Epidemiology of Pesticide Poisoning*. (See Fig. 14.)



On camera, at the National Medical Audiovisual Center, during the filming of *Concepts and Controversies in Modern Medicine*.

Fig. 13

### Acquisition, Distribution, and Reference

The Branch moved to a new, leased building at 2111 Plaster Bridge Road, N.E., Atlanta, Georgia 30324. Advantages of the new building include a fireproof depository for the archival and other media reference collections, space for more efficient distribution of films, and office space for maintaining books and records related to film scheduling loans. The building also provides space for educational activities of the Center and for meetings.

In FY 1969, the International Index of Medical Film Data—a listing of 25,000 citations to biomedical audiovisuals—was converted for computer processing. Two cross-refer-

ence files allow comprehensive retrieval by any combination of subject categories and sources. The Index is now enlarging its data base by about 225 new titles per month from the catalogs of medical societies, pharmaceutical houses, commercial film libraries, universities, and medical schools.

In FY 1969, more than 5,000 audiovisual units were acquired for the distribution, archival, still photographic, and stock-footage collections. Among new subjects available in still photographs are series from the Veterans Administration showing internal human organs, and from the National Institute of General Medical Sciences on in-

strumentation to record breathing patterns; a collection of photographs from the National Institutes of Health on research activities concerning sickle cell anemia, and a collection of material from the University of Wisconsin showing research related to the metabolically active form of vitamin D.

### Educational Systems and Development

Consultation and site surveys were made in FY 1969 to help speed the transition of medical education from traditional methods to new educational techniques. Audiovisual systems planning and educational studies were conducted at the State University of New York Medical Centers; Massachusetts General Hospital; Medical College of South Carolina; University of Miami Medical School; Florida Regional Medical Program; College of Veterinary Medicine, Kansas State University; Northwestern University Medical School; and the Beth Israel Hospital,

Boston, Massachusetts. Consultations included discussions on setting up audiovisual departments in schools of the health professions and orientation to NMAC program activities.

Representatives of the NMAC Educational Systems and Development Branch participated during FY 1969 in a series of seminars and conferences in the Middle East and Europe, held under the auspices of the World Health Organization. There were meetings in Ankara, Turkey; Teheran, Iran; Varna, Bulgaria; Stockholm, Sweden; Utrecht, The Netherlands; and Zagreb, Yugoslavia. Participants in the sessions included deans of medical schools and government health officials from Europe, Asia, and Africa.

A 186-page publication, *Assistive Devices for the Handicapped*, was prepared in cooperation with the American Rehabilitation Foundation, which is now distributing the book.

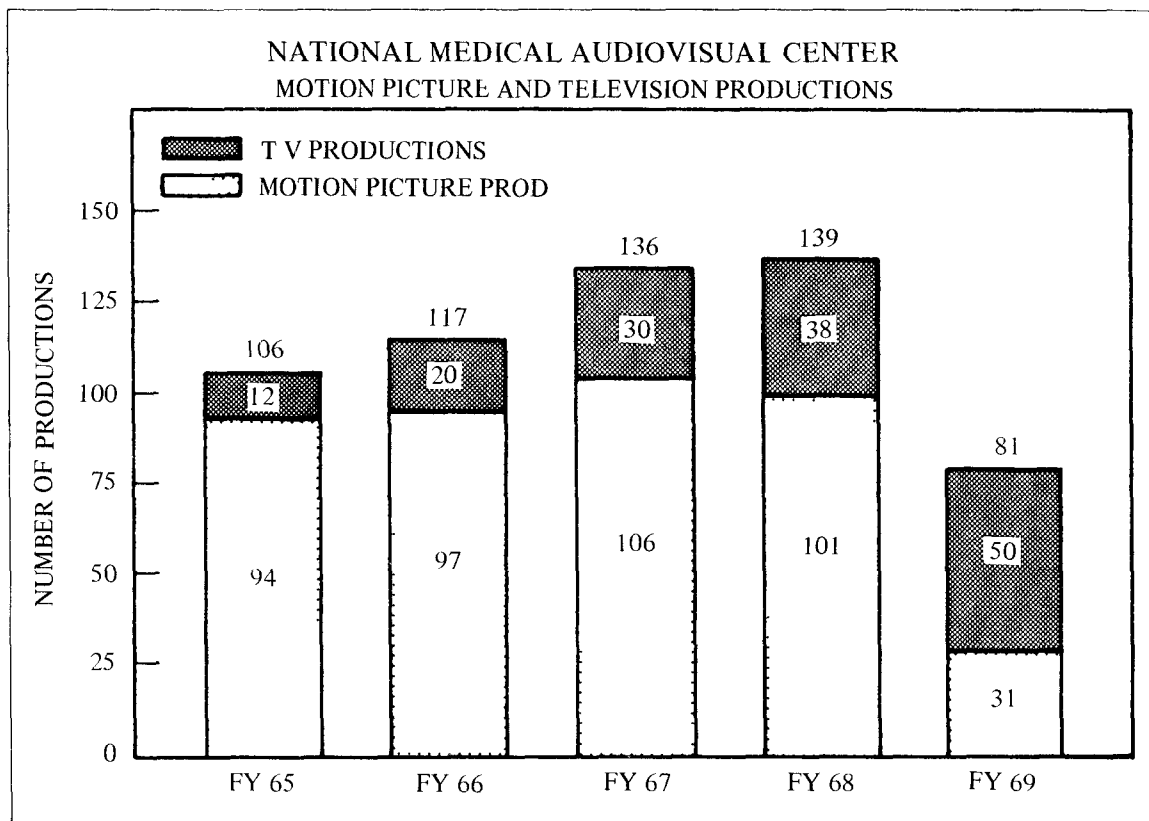


Fig. 14

After analysis of information gathered during site visits to ten VA Hospitals and Centers in FY 1969, staff members of the Branch prepared and submitted a final report to the Veterans Administration. Selected audiovisual materials have been duplicated and

are in use at installations involved in the pilot program. Brochures and posters were printed and distributed to promote the continuing education package available through these centers.

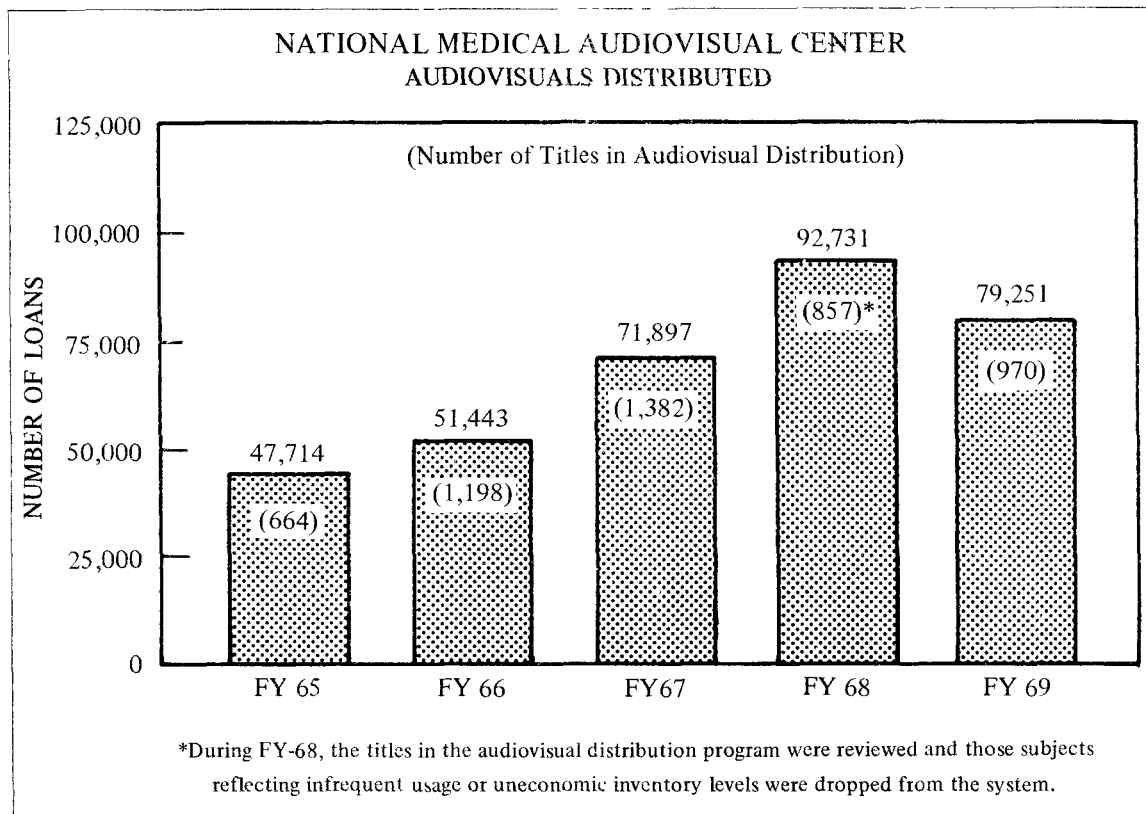


Fig. 15

**NMAC Technical Advisory Committee**

Dr. Winfred L. Godwin  
Director, South Regional Education Board  
Atlanta, Georgia

Dr. Harold B. Gores  
President, Educational Facilities  
Laboratories, Inc.

Mr. K. B. Benson  
Staff Consultant  
Advanced Engineering  
CBS Television Network

Mr. Gerald G. Graham  
Director of Planning and Resources  
National Film Board  
Canada

Dr. Hilliard Jason  
Director, Office of Medical Education  
Research and Development  
Michigan State University

# THE LISTER HILL NATIONAL CENTER FOR BIOMEDICAL COMMUNICATIONS

## THE OFFICE OF THE ASSOCIATE DIRECTOR FOR RESEARCH AND DEVELOPMENT

The Lister Hill National Center for Biomedical Communications (LHNCBC) was established on August 3, 1968, when the President signed Senate Joint Resolution 193 (Public Law 90-456). The Secretary, Department of Health, Education, and Welfare, placed the Center within NLM and assigned its functions in a memorandum dated September 18, 1968. In November 1968, the charter and organization of LHNCBC were approved; resources of the Associate Director for Research and Development were transferred to the Center.

The Center has as its primary function the improvement of communications within the medical community. The LHNCBC serves the Director, National Library of Medicine, in planning for and coordinating Departmental efforts aimed at improved communications. It does this through its three assigned responsibilities:

- to serve as the focal point within DHEW for biomedical communications systems and network projects
- to apply existing and advanced technology to the improvement of biomedical communications
- to design, develop, implement, and provide technical management of a Biomedical Communications Network.

### ORGANIZATION AND RESOURCES OF THE LHNCBC

LHNCBC carries out its responsibilities through four branches. The Research and Development Branch sponsors and conducts research and development in biomedical com-

munications sciences, utilizing relevant existing technology. The Network Engineering, Communications, and Operations Branch supervises the engineering and technical operations of the Network. The Network Plans and Management Branch plans biomedical communications, information systems, and network projects, and coordinates the biomedical communications project and network activities of other elements of DHEW. The Customer Products and Services Development Branch identifies needed products and services and acts as a liaison between the LHNCBC and the users in the medical community.

A staff of 12 personnel (nine professional and three clerical) was authorized at the end of FY 1969. In addition, the LHNCBC has three authorized consultants. The Secretariat of the Information Sciences Technology Panel (II) of the Committee on Scientific and Technical Information (COSATI), with a consultant, is also attached to the Center. Three staff members from the Council on Library Resources have been assigned to assist the work of the National Libraries Task Force, working through the LHNCBC.

To help fulfill its responsibilities, the Center negotiated contracts with the following organizations during FY 1969: Association of American Medical Colleges; Aerospace Corporation; Inter-university Communications Council (EDUCOM); Federation of American Societies for Experimental Biology; Massachusetts Institute of Technology Lincoln Laboratory and Project MAC; Rand Corporation; System Development Corporation; Stanford Research Institute; BASYS Corporation; and the University of Wisconsin.

The principal activities of LHCBC during FY 1969 can be grouped in the following five general areas.

### **Interpretation of Communication Needs of the Medical Community**

LHCBC has relied heavily on the opinions and recommendations made by the NLM Board of Regents and other recognized spokesmen in order to interpret the communications needs of the medical community and establish the necessary priorities.

In December 1968, NLM sponsored the first conference to consider "Communications for Biomedical Education and Research." In February 1969, the Association of American Medical Colleges held a conference to examine the needs for a communications network and the potential for such a development. It considered educational resources of importance to the Biomedical Communications Network and suggested the following actions:

- support and cooperate in the development of new techniques and tools
- take the lead in developing criteria by which existing educational materials can

be judged

- encourage institutions to share their resources and expertise

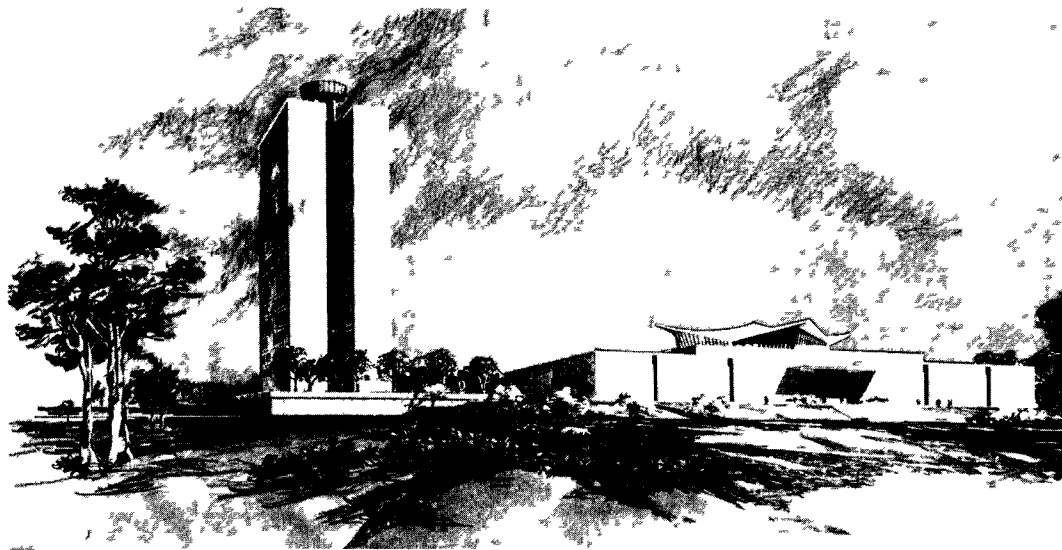
### **Biomedical Communications Inventory**

The absence of an adequate body of organized information describing communications activities in the biomedical field resulted in a request for a Biomedical Communications Inventory. At the request of the Office of the Assistant Secretary for Health and Scientific Affairs, LHCBC has collected information on DHEW-sponsored projects involving the use of communications technology.

The project reports collected in the inventory were analyzed for completeness of reporting and for relevance to the planning needs of DHEW managers. In addition, the projects were categorized by a subject classification scheme developed for the purpose.

The inventory has enabled LHCBC to:

- assess biomedical communications activities within the Department
- identify biomedical communications managers within DHEW



Architect's conception of the Lister Hill National Center for Biomedical Communications, shown behind the National Library of Medicine.

Fig. 16

- identify communications projects of broad interest to the biomedical community
- plan a continuing LHCBC inventory and analysis program.

The inventory program will facilitate the distribution of project reports to DHEW communications managers. The information contained in these reports is also being made available for on-line query via remote-access computer terminals throughout the Department.

Provision to managers and administrators of information derived from the Biomedical Communications Inventory and its accompanying analysis will be a significant step toward the effective coordination of communications activities both within DHEW and with other agencies of the Federal Government.

### **Support of Other DHEW Agencies**

During the year the Center cooperated with a number of other DHEW organizations in information projects. For example, with the assistance of LHCBC, the National Institute of Neurological Diseases and Stroke has developed and tested a file of 1,301 abstracts on the subject of epilepsy for on-line retrieval.

### **Specification of the Biomedical Communications Network**

The Center is planning for implementation of a Biomedical Communications Network (BCN) composed of five major components. The first four are distinguished by the kinds of services being provided and the technology associated with those services. The fifth is a supporting service to the other Network components.

The components of the Biomedical Communications Network are: (1) the library component, which provides bibliographic ref-

erences, or actual delivery of documents or abstracts; (2) the specialized information services component, delivering actual information on questions or problems of biomedical importance; (3) the specialized educational services component, which provides services primarily to support continuing medical education and undergraduate and graduate medical education; (4) the audio and audiovisual services component, which delivers audio and audiovisual materials to medical and lay audiences; and (5) the data processing and data transmission component, the Network's technological backbone, which will support the service components.

The LHCBC prepared a management plan for building the Network; it was reviewed by the staff of the Library and approved by the Board of Regents. The Director, NIH, has also stated that he "fully supports" the ultimate goals and objectives of the Network. Thus, FY 1969 saw the beginning of the process of planning and specifying the BCN.

### **Initial Phase of the Biomedical Communications Network**

The initial phase of the BCN emphasizes the interconnection of existing local medical information and communications systems into a first experimental network. This phase will be implemented in FY 1970, using experimental projects which depend heavily on communications with and between medical professionals and institutions. The BCN prototype phase will involve experimentation in three major areas:

- AUDIO SYSTEMS—to include dial access and telelecture systems
- VIDEO SYSTEMS—to include such facilities as the Community Medical Television System and various educational television (ETV) systems
- ON-LINE COMPUTER SYSTEMS—to include medical information banks, bibliographic information systems, and systems for clinical logic, clinical diagnosis, self-paced instruction, and problem solving.



The selection of existing candidate systems in each of these areas began in FY 1969. In some instances, prototype experimentation is already under way. In the area of audio systems, a preliminary cost analysis of a nationwide manual dial access system has been completed; a contract has also been negotiated for (1) a comparative analysis of manual and automated dial access systems, and (2) the preparation of a plan for implementing and maintaining a nationwide system. In the area of on-line computer systems, the Lister Hill Center is experimenting with a number of medical information banks and bibliographic information systems, and has completed one experiment in the on-line retrieval of MEDLARS citations. Formal experimentation has been initiated in other areas such as video systems, clinical logic systems, self-paced instruction systems, and systems to support clinical diagnosis.

The Center has projected the costs of expanding the services of a number of local systems to a national audience. These cost

estimates are now being used to identify critical technical problems and review alternatives such as regionalism versus centralization.

Support of the plan to develop a Biomedical Communications Network is evident throughout the medical community. At a recent meeting of the Western Regional Medical Programs, for example, the conferees indicated the great need for standardization of equipment and programs so that inter-regional transmission would be possible. The LHCBC is emphasizing standardization as a means of reducing costs and improving services. Volunteering their support have been such specialty groups as the American Academy of Orthopedic Surgeons, the American Academy of Dermatology, the American College of Cardiology, and the American College of Physicians. Thus, FY 1969 saw the initiation of a joint effort between LHCBC and other Departmental agencies, medical societies, and medical institutions.

## EXTRAMURAL PROGRAMS

The Office of Extranural Programs (EP) makes awards authorized by the Medical Library Assistance Act of 1965. The following sections present a summary of these grant activities and some examples of grantee accomplishments.

### MEDICAL LIBRARY CONSTRUCTION PROGRAM

During FY 1969, the Facilities and Resources Division reviewed nine construction applications requesting \$15,433,651, and awarded three grants. These were for new health library construction at the University of Utah Medical Center and the Auburn University School of Veterinary Medicine, and a small supplement to a prior grant to Wayne State University for a medical school library. The medical library construction grant program was transferred to the Bureau of Health Professions Education and Manpower Training in December 1968.

### TRAINING AND MANPOWER

Training grants from the Research and Training Division are awarded to schools of library science, information science, medicine, and other professional schools to assist in the development of graduate and postgraduate training programs for health science information and communication specialists. In FY 1969, NLM supported training programs at the universities of Chicago, Minnesota, Illinois, and Tennessee, Washington University, Johns Hopkins University, Wayne State University, Rockefeller University, Tulane University, Yale University, and George Washington University.

Grant support enabled continuation of a comprehensive nationwide survey of medical library personnel designed to (1) gather data on present medical library manpower, (2)

determine staff requirements for current and future health libraries and information services, and (3) design new educational programs for health information personnel.

### SPECIAL SCIENTIFIC PROJECTS

Special Scientific Project grants administered by the Research and Training Division assist outstanding scientists and academicians in the scholarly analysis, evaluation, and synthesis of major advances in health research, education, and service. Awards in FY 1969 assisted studies on occupational medicine, urban health organizations, and comprehensive health systems.

### BIOMEDICAL COMMUNICATIONS RESEARCH

The Research and Training Division administers a program of research grants to support a broad range of information activities, including experiments on the information needs, habits, and preferences of health professionals; development of selective dissemination of information techniques; and the use of computer graphic languages. EP staff provide advice and assistance to potential and current grantees, and assist in the review of applications. During FY 1969, ten new research grants were awarded. A series of visits and discussions with scientists in relevant disciplines has been initiated to acquaint potential research investigators with the scope and objectives of the program.

### MEDICAL LIBRARY RESOURCE GRANTS

These grants, administered by the Resources Division, are awarded to expand and improve basic medical library resources. They may be used to purchase, process, and service

**EXTRAMURAL PROGRAMS  
PROGRAM ACCOMPLISHMENTS—FY 1969**

Program	No. of Awards*
Construction Grants .....	3
Training Grants and Fellowships .....	17
Special Scientific Projects .....	3
Research Grants .....	46
Medical Library Resource Grants .....	389
Regional Medical Library Grants .....	8
Publication Grants .....	15
TOTAL .....	483

\* For continuing and new projects.

Fig. 17

books, journals, and other informational material; to procure equipment and supplies which facilitate the use of library resources; and to introduce new technologies and services.

During FY 1969 new grants were awarded to 15 libraries; second-year assistance was extended to 120; third-year awards to 251; and fourth-year awards to 3. Most resource grant funds are being used to expand basic collections of books, journals, and reference tools.

**REGIONAL MEDICAL LIBRARY PROGRAM**

The Resources Division of the Extramural Programs advises applicants, reviews applications, makes awards, and provides fiscal management for a program of regional medical library grants to assist in the development of a national system of regional medical libraries.

Grants were awarded in FY 1969 to five libraries for establishment of regional programs. The regions for which regional medical library program grants have been awarded through FY 1969 are: New England Region—Francis A. Countway Library of Medicine (Boston), awarded 6/26/67; Pacific Northwest Region—Health Sciences Library of the University of Washington (Seattle), awarded 6/1/68; Mid-Eastern Region—Library of the College of Physicians (Philadelphia), awarded 6/1/68; Midwest Region—John Crerar Library (Chicago), awarded 9/1/68; East Central Region—Wayne State University Medical Library (Detroit), awarded 1/16/69; Pacific Southwest Region—Biomedical Library, University of California at Los Angeles, awarded 2/11/69; New York Region—New York Academy of Medicine Library, awarded 2/11/69; Southeastern Region—A. W. Calhoun Medical Library, Emory University (Atlanta), awarded 6/23/69.

## PUBLICATIONS AND TRANSLATIONS

The Publications and Translations Division sponsors both a domestic grants program to provide selective support for secondary literature projects in the biomedical sciences, and an international program, employing special foreign currencies, authorized under Public Law 480 as amended, to foster the international exchange of biomedical information.

### Domestic Program

Grants awarded under this program assist the preparation and/or publication of secondary publications which condense, synthesize, repackage, or evaluate some aspect of literature related to health. Publication projects currently cover 22 different health science areas, both preclinical and clinical. A number of significant projects were initiated

during FY 1969, including: (1) a new journal in nutrition education; (2) a manual of public health principles for medical personnel; (3) a project to produce and evaluate innovative, multi-media, self-teaching materials for medical students.

### International Program

The Special Foreign Currency Program has been a major component of the Library's over-all international information exchange program for the past ten years. This program of the Publications and Translations Division seeks to advance communications in the health sciences through cooperative efforts with scientists of other countries. Projects are currently active or under negotiation in Egypt, India, Pakistan, Israel, Poland, and Yugoslavia.

<b>EXTRAMURAL PROGRAMS</b>	
<b>TYPES OF PUBLIC LAW 480 PROJECTS ACTIVE IN FY 1969</b>	
Type	Number of Projects
Abstracting projects .....	2
Audiovisual projects .....	1
Conference proceedings .....	1
Critical reviews .....	7
Handbooks .....	2
Histories of medicine .....	3
Indexing projects .....	1
Translation and publication, Polish and Yugoslav journals .....	13
Translations (monographs) .....	2
TOTAL .....	32

Fig. 18

**U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE**  
**Public Health Service**  
**National Institutes of Health**