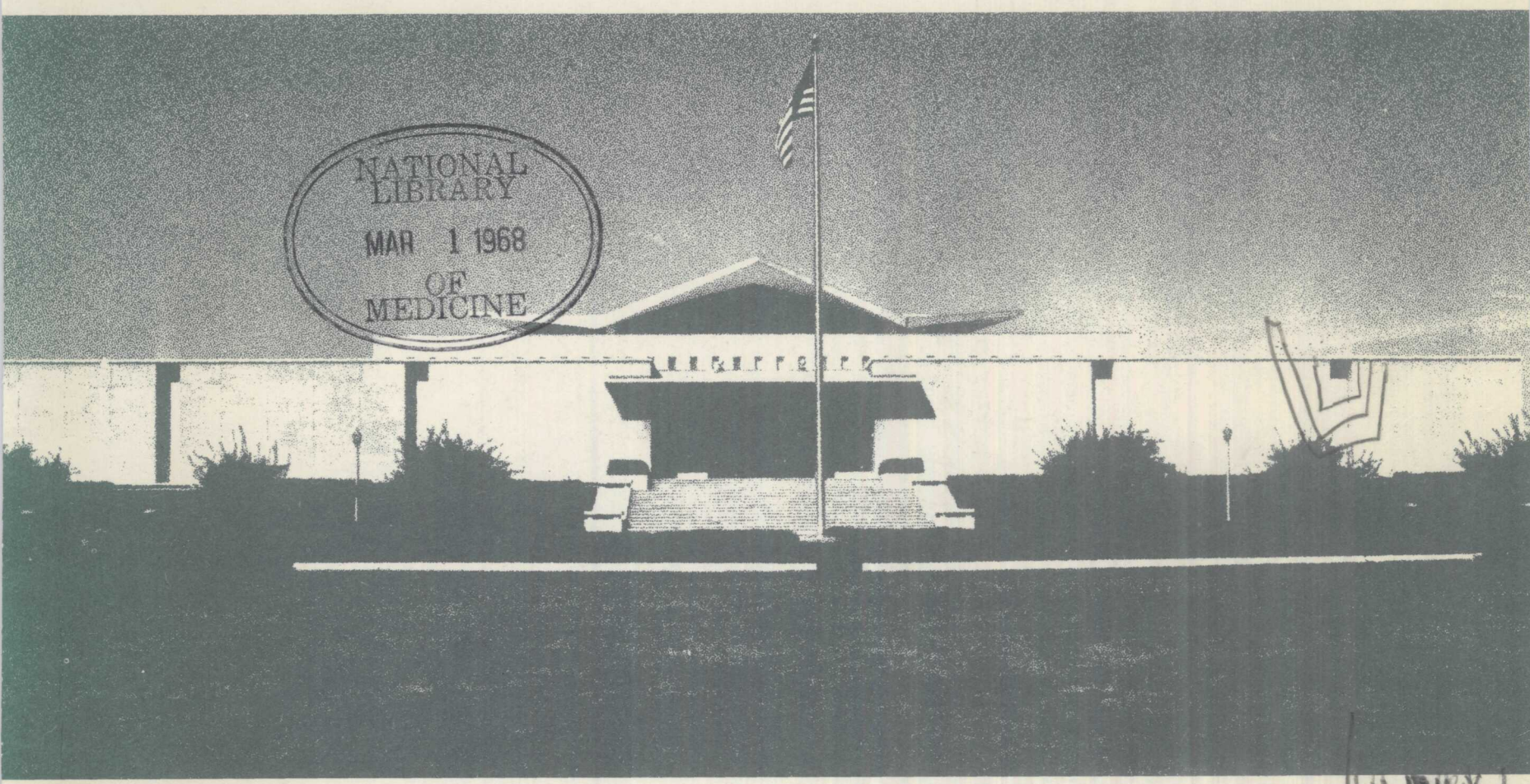
NATIONAL LIBRARY OF MEDICINE



fy Annual Report 1967

Annual Report
for the
Fiscal Year 1967

National Library of Medicine

8600 Rockville Pike / Bethesda, Md. 20014

BOARD OF REGENTS

Bean, William B., M.D.
Professor and Chairman
Department of Internal Medicine
State University of Iowa
College of Medicine

Dixon, Russell A., M.S.D.
Dean Emeritus, Howard University

Fussler, Herman H., Ph.D.
Director
University of Chicago Library

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Department of the Air Force

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The Surgeon General
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Division Director for Biological and Medical Sciences
National Science Foundation

Engle, H. Martin, M.D.
Chief Medical Director
The Veterans Administration

Heaton, L. D., Lt. General, M.C.
The Surgeon General
Department of the Army

Mumford, L. Quincy, LL.D.
The Librarian of Congress

Stewart, William H., M.D.
The Surgeon General
U.S. Public Health Service

CONTENTS

The sheer mass of material that libraries must handle is a challenge that they have never faced before. As the repository of human knowledge, the Library has to grow. It has to take back what it has helped to create so that students can learn and scholars can create still more.

John W. Gardner

In Fiscal Year 1967, several major new programs were undertaken to increase the Library's capability and responsiveness in coping with the expanding volume of biomedical information and improving the mechanisms for disseminating this information to health practitioners, researchers, and educators.

- The Library's Toxicology Information Program was instituted in January 1967 in accord with the recommendations of the President's Science Advisory Committee and a directive of President Johnson. Guidance for the Program is provided by a Toxicology Information Coordinating Committee, appointed by the Assistant Secretary for Health and Scientific Affairs.

- A new Research and Development Program in biomedical communications was established in April 1967. Through a combination of intramural and extramural projects, the Library plans to develop automated document- and information-handling networks and to utilize other modern technology to improve the flow of biomedical information. The Program is responsive to a Congressional directive to plan for the establishment of a Center for Biomedical Communications. To refine and improve MEDLARS (Medical Literature Analysis and Retrieval System) services to the biomedical community, an evaluation of the existing system was initiated. The study will provide data on the usefulness, precision, and recall of demand bibliographies.

- In response to expressed interest by the Special Subcommittee on Investigation of DHEW of the House Committee on Interstate and Foreign Commerce, and Secretary Gardner, a PHS Task Force was established in January 1967 to study the organizational location of the PHS Audiovisual Facility in Atlanta. Surgeon General Stewart, acting on the report of the Task Force and with the advice of the Board of Regents, recommended merging the major programs of the Service concerned with biomedical communications. With the endorsement of the Secretary, the Surgeon General authorized the organizational transfer of the PHS Audiovisual Facility to the National Library of Medicine, effective July 1, 1967. In consonance with its broadened role, the Atlanta program was renamed the National Medical Audiovisual Center.

The President appointed two new members to the Library's Board of Regents: Kathryn M. Smith, D.Ed., Dean, School of Nursing, University of Colorado; and Alfred R. Zipf, Executive Vice President, Bank of America. At the June Board meeting, Barnes Woodhall, M.D. was elected Chairman replacing William N. Hubbard, Jr., M.D., who retired. Other Regents whose terms also expired at the end of the year were Russell A. Dixon, M.S.D. and Herman H. Fussler, Ph.D. During the year the Board was particularly concerned with the Library's

research and development program and audiovisual plans, and reviewing applications for grant support under the Medical Library Assistance Act (Public Law 89-291).

The grants program is designed to strengthen the Nation's public and private health-science libraries through support for construction, library resources, training of librarians, research, publications, and the development of a system of regional medical libraries. More than $6,000,000 was awarded in the first full fiscal year of operation under the Act, including a $104,872 grant to the Francis A. Countway Library of Medicine (of the Harvard Medical School and the Boston Medical Society), the first Regional Medical Library grant from NLM.

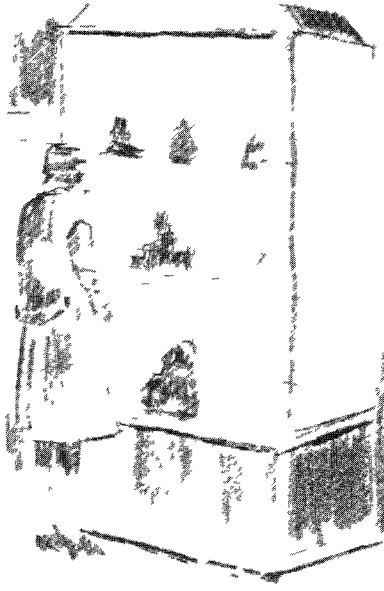
Affording health professionals greater access to MEDLARS, a sixth decentralized MEDLARS station became operational at Ohio State University, supplementing the capability at NLM and the MEDLARS stations at Harvard, UCLA, and the Universities of Colorado, Alabama and Michigan.

After more than three years of successful operation, a new generation of computer equipment is being planned to further automate NLM services. In FY 1967, the Library awarded a systems study contract under which were developed specifications to enhance and extend the effectiveness of MEDLARS.

FY 1967 marked the beginning of a coordinated automation effort among the three national research libraries--NLM, the Library of Congress, and the National Agricultural Library. Among the goals are: achievement of compatible bibliographic data elements for library cataloging; creation of a national pool of machine-readable cataloging information; establishment of a national centralized pool of machine-readable data on serial identification and holdings; and development of compatible subject heading and classification schemes.

The reports that follow have been prepared by program officials. They are candid and reflect the problems as well as the progress of FY 1967.

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



OFFICE OF THE DIRECTOR

The success of a program depends on many factors. How well the program is conceived is one factor, funding another. The most important element is the caliber of the individuals who lead and manage. The Library was particularly fortunate in being able to attract individuals with outstanding scientific and technical backgrounds to senior positions during FY 1967.

Appointed to head the new Toxicology Information Program was Charles N. Rice, Ph.D., a member of the Committee on Modern Methods of Handling Chemical Information, Division of Chemistry and Chemical Technology of the National Research Council. Dr. Rice brings to the Library experience in the pharmaceutical industry, a record of achievement in handling scientific information, and a high level of knowledge of chemistry, drug information and the technology of communications management.

Ruth M. Davis, Ph.D., research mathematician, was appointed as Associate Director for Research and Development. Formerly with the Department of Defense, her primary responsibilities were with information sciences research and development while serving as Staff Assistant to the Special Assistant (Intelligence and Reconnaissance) to the Director of Defense Research and Engineering.

Miss Mary Corning, formerly Chief, Publications and Translations Division, to Special Assistant to the Deputy Director;

Dr. Burnet M. Davis to Extramural Programs as Research Grants Officer, in addition to his responsibility as the Library's Continuing Education Officer;

Dr. Russell A. Dixon, member of the Board of Regents, as Consultant-in-Residence on Dental Affairs;

Mr. Allen P. Doris as Head, Systems Analysis Section and Acting Chief, ISD;

Mr. Herbert H. Fockler to Research and Training Division, EMP, as Training Grants Officer;

Dr. Louis S. Gerber, formerly Deputy Chief, TSD, to Facilities and Resources Division, EMP, as Regional Medical Library Program Director.

Mr. George F. Russell, Jr., as Assistant Executive Officer;

Dr. Peter D. Olch as Deputy Chief, HMD;

Mr. Robert A. Walkington as Construction Program Officer, Facilities and Resources Division, EMP;

Mr. John A. Timour as Training Officer.

STAFF HONORS

Mr. James D. Isbister, Executive Officer, was accorded special recognition by the William A. Jump Memorial Committee. The Committee annually honors outstanding Federal Government employees under 37 years of age in the field of public administration.

Within-grade step increases for superior performance were awarded to Mr. David F. Kefauver, Miss Tina Meeker, and Mr. John P. Spain. Mrs. Thelma G. Charen of BSD earned a cash award for preparing NLM's INDEXING MANUAL.

Mr. Daniel L. Carangi and Mr. Gerald N. Kurtz were cited for "Excellence in visual communications" by the Society of Federal Artists and Designers.

Mr. Robert A. Buck of TSD was recognized by the Secretary of HEW for 40 years of Federal service. John B. Blake, Ph.D., was awarded an honorary M.D. degree by the Connecticut State Medical Society.

TRAINING

The Library this year inaugurated its Associate Program for postgraduate training in biomedical librarianship. Three candidates--Miss Carmen E. Bravo, Miss Frances E. Hasemeier, and Mr. William I. Plank--successfully completed a program of supervised study and work assignments, rotating in the Library's operating divisions and attending lectures, seminars, and workshops.

Seventy-five employees participated in various in-service training programs in the Library during FY 1967. Twenty-two participated in training programs at other government agencies and sixty-six studied at non-governmental facilities, and one employee attended library school full-time.

Nineteen students were provided an opportunity for meaningful employment during the summer months. Eleven students under the President's Youth Opportunity Program, three under the PHS Commissioner Officers Student Training and Extern Program (COSTEP), and six appointed from the Civil Service clerk-typist register, supplemented the Library's work force.

FINANCIAL MANAGEMENT

During FY 1967 the Budget Office was redesignated the Financial Management Office, reflecting its broadened scope of responsibilities and activities.

In September 1966 the staff completed a cost analysis of MEDLARS which expressed the system's cost in terms of the three principal products of the system (INDEX MEDICUS, demand bibliographies, and recurring bibliographies). The analysis called attention to the multi-purpose nature of the system and the necessity to treat basic system input costs as multi-purpose costs.

The Library participated in the development of a unit cost analysis covering open literature, current research, and document-handling systems in selected Federal agencies. This study was sponsored by the Panel on the Management of Information Activities of the Committee on Scientific and Technical Information (COSATI).

The Planning, Programming, and Budgeting System (PPBS), recently installed government-wide, has provided a framework within which the Library conducts long-range financial planning in a program context. Workload data and identified health information needs will be used to develop financial plans of maximum economic effectiveness.

Internal improvements in the mechanisms for execution of the NLM budget were effected. While contract funds and major equipment purchases remain in Division budgets, minor objects of expenditure such as travel, supplies, and small items of equipment are now consolidated at the Associate Director level. A monthly analysis of budget operations is prepared and summary information on budget execution is presented at the Director's quarterly program and performance briefings.

CONTRACTS

Contracting (excluding Extramural Programs) doubled this year over the previous year. Nineteen contracts were awarded for a total of $1,269,138.

	Number	Amount
Decentralized MEDLARS	6	$401,471
Contracts related to procurement of a new computer system	2	90,438
Contracts supporting Library technical developments (indexing, input, programming, microfilming, GRACE maintenance)	10	740,229
Architectural and engineering services	1	37,000

Highlights

1. The Library contracted for assistance in development of the functional specifications for the new computer equipment and also awarded contracts designed to prepare manual files in TSD for conversion to computer operations.

2. In November a contract was awarded to O'Connor

and Kilham, a New York architectural firm, to study NLM's requirements for new facilities. O'Connor and Kilham designed the present NLM building. If planning funds are appropriated for FY 1969, the building could be available for occupancy by 1972.

The architect's report identifies anticipated requirements (for 1973) and analyzes alternative means of constructing the required new facilities on the NLM's Bethesda site. The architect recommends a 16-story tower annex and extension of the underground levels of the existing facility.

3. An architectural contract for converting stack space on 'C' level to office and microfilm storage space was awarded late in the fiscal year. Plans and specifications are due late in October.

PUBLIC INFORMATION AND PUBLICATIONS

Beginning in January 1967 the Library's computer-produced publications appeared with a new look. The new covers all bear a family resemblance--new uniform type and half-tone illustrations to indicate contents.

Three new publications were particularly well received and were widely disseminated: NLM brochure describing programs and services; brochure on Extramural Programs; and a GUIDE TO MEDLARS SERVICES.

Test marketing was conducted for the proposed monthly BIBLIOGRAPHY OF MEDICAL REVIEWS. Response was favorable and the new bibliography is expected to appear in January 1968.

With increased promotion, 18,233 Literature Searches (bibliographies originally produced in response to individual requests which are reformulated and printed for widespread distribution) were sent to health professionals, 10,920 more than in FY 1966.

The exhibit program was expanded. A new modular exhibit depicting NLM programs and services was shown at five major professional meetings in FY 1967. Small portable display units, illustrating MEDLARS and its products were made available to 31 institutions. Featured in the Lobby were three historical exhibits: Medical Symbolism; Weisman Collection of Pre-Columbian Medical Sculpture; and 2000 Years of Mental Illness.

There were approximately 5,000 visitors, 3,000 of whom were conducted on tours of the Library.

NLM activities were covered by national and local media--newspapers, magazines, professional journals, radio, and television.

DENTAL AFFAIRS

An experimental Symposium on the Use of Medical Libraries was conducted by the Coordinator for Dental Affairs.

Russell A. Dixon, M.S.D., conducted a Conference on the Role of the National Library of Medicine in Continuing Education--Dental. The Conference was the first in a series of meetings designed to explore positive programs in continuing dental education that could be sponsored by the Library.

VETERINARY AFFAIRS

An Advisory Panel on Veterinary Medicine was established to assist in the development of a veterinary vocabulary for Medical Subject Headings (MeSH). The Panel is composed of seven veterinarians; three appointed by the National Agricultural Library, three by NLM, and one by the American Veterinary Medical Association.

The Library now receives 160 veterinary journals, an increase of about one-third. Veterinary books in the collection also increased by about one-third and now number approximately 2,000. The requests for Demand Bibliographies concerned with veterinary medicine have increased to a total of 135 during FY 1967.

OUTSIDE RELATIONSHIPS

NLM Deputy Director, Scott Adams, was inaugurated as President of the Medical Library Association for 1967-68.

Increasingly, the Library has become involved in governmental efforts to develop national policy relating to scientific and technical information, and with efforts to strengthen biomedical communication practices internationally. Throughout the year the Director, with the Deputy Director as alternate, represented the Department of Health, Education, and Welfare on the Committee on Scientific and Technical Information (COSATI) of the Federal Council on Science and Technology.

The Director also served on the COSATI Ad Hoc steering group, on the Task Group on National Systems for Scientific and Technical Information, and on the Panel on International Information Activities.

Individual members of the Library staff participated on COSATI panels and task groups as follows:

Mr. Scott Adams and Miss Mary E. Corning, alternates, on the Panel of International Information Activities;

Dr. Ruth M. Davis, Chairman, Panel on Information Sciences Technology

Mr. James P. Riley, Panel on Operations Techniques and Systems;

Mrs. Lillian Washington, Sub-panel on Transfer of Bibliographic Transcriptions by Magnetic Tape;

Mr. F. W. Lancaster, Panel on Information Sciences Technology;

Mr. James G. Hill, Panel on Management of Information Activities.

Complementary to the efforts of COSATI, the National Academy of Science/National Research Council established a Committee on Scientific and Technical Information (SATCOM) to represent the interests of private scientific societies in national systems development. SATCOM met with the Library to review common problems relating to toxicological information.

NLM was represented on the Federal Library Committee by the Director with the Deputy Director as alternate. Individual members of the Library staff served on task groups of the Federal Library Committee as follows:

Dr. Louis S. Gerber	Acquisitions
Mr. Edward A. Miller	Interlibrary Loan
Mr. Scott Adams	Mission of Federal Libraries
Miss Elizabeth J. Sawyers	Procurement
Mr. Herbert H. Fockler	Role of Libraries in Information Systems

The establishment of the President's National Advisory Commission on Libraries and its subsequent review of library functions in contemporary society inevitably involved the National Library of Medicine. The Deputy Director made a formal presentation to the Commission on NLM functions and program plans. Two Regents were named by the President to serve on the Commission: William N. Hubbard, Jr., M.D., and Herman H. Fussler, Ph.D.

The Library continued operations under its agreement with the Agency for International Development whereby Interlibrary Loan, MEDLARS search, and other reference services were made available to U.S./AID Missions overseas and to institutions in AID countries. NLM assisted in the development of the Medical Library at the University of Saigon, and cooperated with AID and the American Medical Association in further planning for the provision of improved library services.

plans for Regional Medical Library services in South America in conjunction with the Pan American Health Organization. An agreement was concluded among PAHO, the Federal Government of Brazil, the Commonwealth Fund, and the National Library of Medicine for the joint development under PAHO leadership of the Library of the Escola Paulista de Medicine of Sao Paulo, Brazil, which will provide supplemental medical library resources in South American countries.

The World Health Organization accepted an offer of the National Library of Medicine to provide training to facilitate the use of MEDLARS for World Health Organization purposes. Two individuals will be trained in 1968 so that searches may be provided for members of WHO staff and expert committees throughout the world. Senator Edward M. Kennedy, representing the Surgeon General, presented to WHO, on behalf of the Library, a three-panel broadside from the HMD Prints Collection "The Plague of Rome, 1656-57."

An important international development was action taken toward the further extension of MEDLARS under the auspices of the Organization for Economic Cooperation and Development (OECD). Through the Department of State, the United States proposed the establishment of a consortium of interested European member countries of OECD to introduce MEDLARS search technology in their countries. Following approval of the OECD Science Information Policy Group, an international working party developed proposals which called for the training of searchers from member countries. Computer operations are presently being conducted by two existing overseas MEDLARS Stations at the Karolinska Institutet in Stockholm, Sweden and at the University of Newcastle-Upon-Tyne in the United Kingdom both OECD member countries. As part of the cooperative international effort the member countries will organize to provide the National Library of Medicine with 50,000 indexed citations derived from their own national biomedical journal literatures.

PROGRAM OFFICIALS

OFFICE OF THE DIRECTOR

Director	Martin M. Cummings, M.D.
Deputy Director	Scott Adams
Executive Officer	James D. Isbister
Assistant Executive Officer	George F. Russell, Jr.
Financial Management Officer	James G. Hill
Personnel Officer	Donald J. Detzel
Property and Supply Officer	Joseph McGroarty
Assistant to the Director for Public Information and Publications	Gerald N. Kurtz
Public Information Officer	Robert B. Mehnert
Graphics Director	Daniel L. Carangi
Special Assistant to the Deputy Director	Marv E. Corning
Consultant in Residence for Dental Affairs	Russell A. Dixon, M.S.D.
Coordinator for Dental Affairs	Kenneth C. Lynn, D.D.S.
Coordinator for Veterinary Affairs	Fritz P. Gluckstein, D.V.M.
Training Officer	John A. Timour

RESEARCH AND DEVELOPMENT

Associate Director	Ruth M. Davis, Ph.D.
Information Systems Specialist	Frederick W. Lancaster

INTRAMURAL PROGRAMS

Associate Director	Joseph Leiter, Ph.D.
Special Assistant for Information Centers	Leonard Karel, Ph.D.
Medical Subject Heading Chief	Norman P. Shumway, M.D.

TASK FORCE FOR MEDLARS II

Ronald E. Bogart (ISD)	Elizabeth J. Sawyers (TSD)
William H. Caldwell (BSD)	Joy Stiller (BSD)
Constantine J. Gillespie (BSD)	Lillian H. Washington (ISD)
Grace T. Jenkins (MeSH)	Samuel Waters (RSD)
James P. Riley, Chairman (TSD)	

Technical Services Division

Chief	James P. Riley
Selection and Acquisition Section Head	Salvatore L. Costabile
Exchange Coordinator	Galina V. Zarechnak
Cataloging Section Head	Emilie V. Wiggins

References Services Division

Chief	Samuel T. Waters
Deputy Chief	Edward A. Miller

Reference Services Division (con't)

Reference Section Head	Charles A. Roos
Loan and Stack Section Head	Albert M. Berkowitz
Photoduplication Section Head	Willis A. Lambert

Bibliographic Services Division

Chief	Clifford A. Bachrach, M.D.
Index Section Head (Acting)	Stanley Jablonski
Search Section Head	Charlotte Kenton

Information Systems Division

Chief (Acting) and Systems Analysis Section Head	Allan P. Doris
Computer Applications Section Head	Ronald E. Bogart
Operations Section Head	Daniel E. Belsole

History of Medicine Division

Chief	John B. Blake, Ph.D.
Deputy Chief	Peter D. Olch, M.D.
Curator of Early Western Manuscripts	Richard J. Durling
Senior Cataloger	Peter Krivatsy, Ph.D.
Curator of Prints and Photographs	Ellen B. Wells

EXTRAMURAL PROGRAMS

Associate Director	Marjorie P. Wilson, M.D.
Special Assistant	Ann A. Kaufman, Ph.D.
Grants and Contracts Management Officer	John P. Spain

Facilities and Resources Division

Chief	Carl D. Douglass, Ph.D.
Regional Medical Library Director	Louis S. Gerber, M.D.
Construction Program Officer	Robert A. Walkington

Research and Training Division

Chief	David F. Kefauver
Continuing Education & Research Grants Officer	Burnet M. Davis, M.D.
Training Grants Officer	Herbert H. Fockler

Publications and Translations Division

Chief (Acting)	David F. Kefauver
Scientific Publications Officer	Joseph B. Foley

TOXICOLOGY INFORMATION PROGRAM

Chief	Charles N. Rice, Ph.D.
Assistant to the Chief	Marcus Rosenblum
Drug Literature Program Chief	E. Winifred Sewell

PERSONNEL

PERSONNEL ON DUTY (June 30)

	FY 65	FY 66	FY 67
Office of the Director	40*	51*	11*
Public Information and Publications	-	-	9
Office of Administrative Management	-	-	29
Extramural Programs	13	21	33
Research and Development	-	-	1
Toxicology Information Program **	-	-	10
Intramural Programs	216	237	240
Immediate Office of Associate Director	-	(4)	(9)
Medical Subject Headings	-	(8)	(8)
Bibliographic Services Division	(32)	(32)	(43)
Technical Services Division	(59)	(57)	(56)
References Services Division	(69)	(68)	(69)
Information Systems Division	(41)	(50)	(36)
History of Medicine Division	(15)	(18)	(19)
TOTAL	269	320	333
Personnel Authorized	291	352	397

* Includes PIO and OAM
** Includes Drug Literature Program

FINANCIAL STATISTICS: OBLIGATIONS

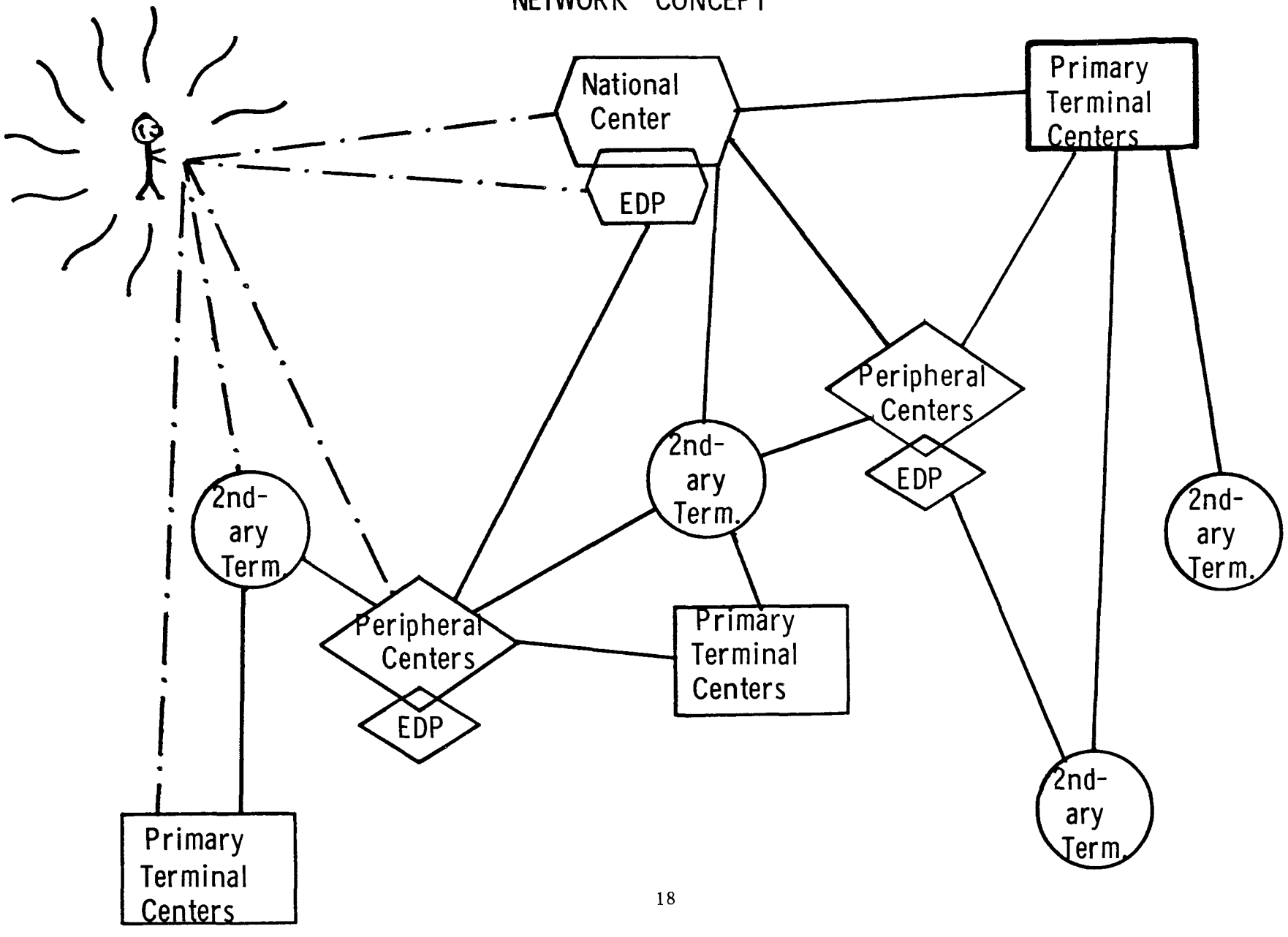
Total Available for Obligation, FY 1967

Regular 1967 Appropriation, NLM		$20,192,000
Transferred from the Office of the Surgeon General		62,000
Reimbursements from other Federal Agencies		81,000
Total (dollar appropriation)		20,335,000
NLM Allowance from Special Foreign Currency Program		
India	16,013	
Israel	481,480	
Poland	456,632	
Yugoslavia	204,900	
	1,159,025	

Amount Obligated by Program, FY 1967

Extramural Grants:	1967 Actual
Training grants	$ 812,000
Special Scientific Projects grants	33,000
Research grants	582,000
Library Resources grants	3,339,000
Regional Medical Libraries grants	105,000
Publications Support grants	413,000
Subtotal, grants	5,284,000
Direct Operations:	
Library Operations	4,603,000
Toxicology	51,000
Extramural Research and Support Contracts	949,000
Review and Approval of Grants and Contracts	486,000
Program Direction	1,195,000
Subtotal, direct operations	7,284,000
Total, National Library of Medicine	12,568,000

NETWORK CONCEPT



RESEARCH AND DEVELOPMENT PROGRAM

BACKGROUND

The need for a major research and development effort to support the information and communications responsibilities of the National Library of Medicine had been recognized in 1966 by the Board of Regents in its Advisory Report to the Surgeon General. In the same year members of Congress, in Hearings of the House Committee on Appropriations, also voiced support for a research and development program. The House Committee Report recommended that funds be appropriated and positions be added "for development and direction of the Library's application of advanced technology to biomedical communications problems; for studying the application of library and related learning resources to the continuing education of health scientists and practitioners; and for planning and development of the Library's role as a center for biomedical communications."

The Office of Associate Director for Research and Development was established on April 24, 1967 when Dr. Ruth M. Davis reported on duty as Associate Director.

During May and June 1967 a formal Research and Development (R&D) Program was formulated and approved by the Director, NLM. It received the support of the Office of the Surgeon General and was subsequently presented to staff members of the Office of Science and Technology and the Bureau of the Budget (BOB).

The R&D Program was presented to the Board of Regents at the June 1967 meeting. The Regents adopted a resolution enthusiastically endorsing the Program.

PROGRAM

The Research and Development Program for Biomedical Communications is intended to assist the biomedical community in improving the transfer of biomedical information. Specifically, the results of the R&D Program should benefit medical practitioners, educators, and researchers.

A. General Program Areas -

Evaluation and observation of communications systems and practices to determine efficiencies and deficiencies and to effect improvements.

Providing immediate improvements to alleviate existing and pressing operational problems.

Application of proven and advanced technology to provide entirely new but improved means for performing communication functions.

Experimentation with and application of new techniques, procedures, and equipment.

Advancement of technology that has specific application to known or anticipated communications needs of the biomedical community.

B. Specific Program Objectives

1. An automated document-handling library network.

2. Automated information-handling networks.

3. System management through system monitoring, system adaptivity, controlled feedback and application of control system procedures.

4. Experimentation with communications systems in controlled environments; Observation and evaluation of operational systems so as to extract system parameters, system inadequacies and component coupling.

5. Query languages, information banks (data banks), and document collections structured to permit direct communication by the biomedical professional.

6. Medical problem-solving with automated assistance.

7. Application of advanced techniques tailored to specific needs of the individual biomedical practitioner, researcher or support personnel, e.g., color in communication, remote browsing, high-resolution material transmission.

8. Education through automated information and communications networks.

C. Method of Approach

There is no reason for the biomedical community or the Department of Health, Education, and Welfare to possess within itself the total R&D resources needed to meet its own requirements. It shares many common communication needs with government agencies, with other collective communities such as the intelligence and the scientific communities, and with industry and educational institutions. It should rely as much as possible on research supported and/or performed by these outside groups.

What is needed now is the capability within the biomedical community to apply technology to its own communications problems. The aim of the NLM R&D Program is to overcome the present lack of resources and funding mechanisms.

In accordance with these principles, NLM research and development efforts will be undertaken only when:

The problems are identifiable as unique to biomedical communications.

There are identifiable communications problems to which the biomedical community has been first to fall heir.

There are communications problems in which the biomedical community has a strong professional interest and for which successful resolution demands interdisciplinary participation.

There are identifiable communications problems which are not being completely resolved by external on-going R&D and in which the biomedical community can materially assist by participating.

SPECIFIC PROJECTS

A. MEDLARS Evaluation

In May 1967 the MEDLARS Evaluation Project under the direction of Mr. Wilfrid Lancaster was transferred to the R&D Program. This evaluation, one of the first of an operational information system, is approximately half completed and involves the analysis of some three hundred demand searches. Intermediate findings already have pointed out means for improvement of the demand search input and have provided preliminary data on the effectiveness of the demand search strategies now in use. The final report on the Evaluation will be completed during the third quarter of FY 68.

Progress Report on MEDLARS Evaluation

A large-scale study of the demand search performance of MEDLARS was designed and pretested in the period December 1965 - July 1966. Full data gathering got underway in August 1966. The principal purposes of the evaluation program are (a) to determine how well MEDLARS performs in response to requests for demand (retrospective) searches made by members of the biomedical community, (b) to discover what factors may be adversely affecting the performance of the system, and (c) to suggest means whereby overall performance may be upgraded.

B. EDUCOM Project

In October 1966 the National Library of Medicine let a research contract to the Interuniversity Communications Council (EDUCOM) to study how biomedical information could be distributed over a network to physicians and institutions serving the medical community. (EDUCOM is a consortium of 76 universities whose prime purpose is to foster the application of the communication sciences in support of higher education.) The EDUCOM Contract was transferred to the R&D Program in May.

During FY 67 considerable time was devoted to examining pertinent literature on medical communications. An attempt was made to develop an understanding of the fundamental structure and objectives of the medical profession. A series of individual physician interviews was conducted to gain first-hand impressions of the information habits and needs of general practitioners and specialists. Visits were made to institutions engaged in medical communications programs. Contacts were established with specialists skilled in technical communications design. Concept papers and research memoranda were prepared by consultants on selected topics.

Approximately 400 demand search requests made to MEDLARS in the period August 1966 to July 1967, by members of twenty organizations agreeing to cooperate in the study, were processed as "test requests." These twenty organizations were carefully selected to produce a "test user group" representative of the principal types of organization making use of MEDLARS.

The requests from these organizations are representative of all the "kinds" of requests (across broad subject fields) coming to the system, and they are handled under various conditions of user-system interaction (personal visit of a requester to a MEDLARS center; mailed request through a local librarian; mailed request without local interaction). This stratified sample allows a study to be made of possible differences in system performance in response to various types of request and under varying conditions of operation.

Test requests were processed in the same manner as non-test requests except that, in addition to a printed bibliography, the requester was supplied with photocopies of a random sample of the articles retrieved, and asked to assess their value, in relation to his information need, on a three-point scale. This allowed the derivation of a precision ratio for each search. A recall ratio was estimated on the basis of MEDLARS performance in relation to a recall base of articles known to the requester at the time he made his request, or found subsequently by parallel manual search at NLM and agreed to be relevant by the requester. These ratios are being used as measures of system performance under various conditions of operation.

The most important part of the evaluation program is the failure analysis, which involves a detailed investigation of precisely why recall or precision failures occur. Such failures may be attributed to any of the several subsystems: indexing, searching, Medical Subject Headings, computer processing, or to the area of user-system interaction. Some 300 of the test searches have been subjected to this detailed analysis, to determine which factors most critically affect performance, and to suggest changes that may be incorporated into MEDLARS to raise its performance level.

The final report on this project will be made in January, 1968, with a publication following.

Because biomedical information is fluid, unstructured, and complex, considerable care must attend the inferences which are drawn from it for network design purposes. The Project staff, therefore, has been working with EDUCOM's Task Force on Clinical Activities and other medical groups to obtain as clear an understanding as possible of the multi-dimensional nature of medical information. Steps were taken in June to form an EDUCOM Advisory Committee for the Project composed mainly of physicians.

From the outset the Project has been under the direction of Mr. Joseph Becker. In May, he was joined by Mr. Ted Mayeda, an experienced systems analyst and designer. The Project was funded for 26 months at a level of $226,890; by the close of the Fiscal Year the Project balance was approximately $153,324 with 17 contract months remaining.

C. MEDLARS Decentralization

In June the R&D Program was assigned the responsiblity for "reviewing and evaluating the fundamental systems concept of decentralization which has been a basis of the MEDLARS system." Since the decentralization concept is one of the keystones for planning an improved health information system, high priority is being placed on this project.

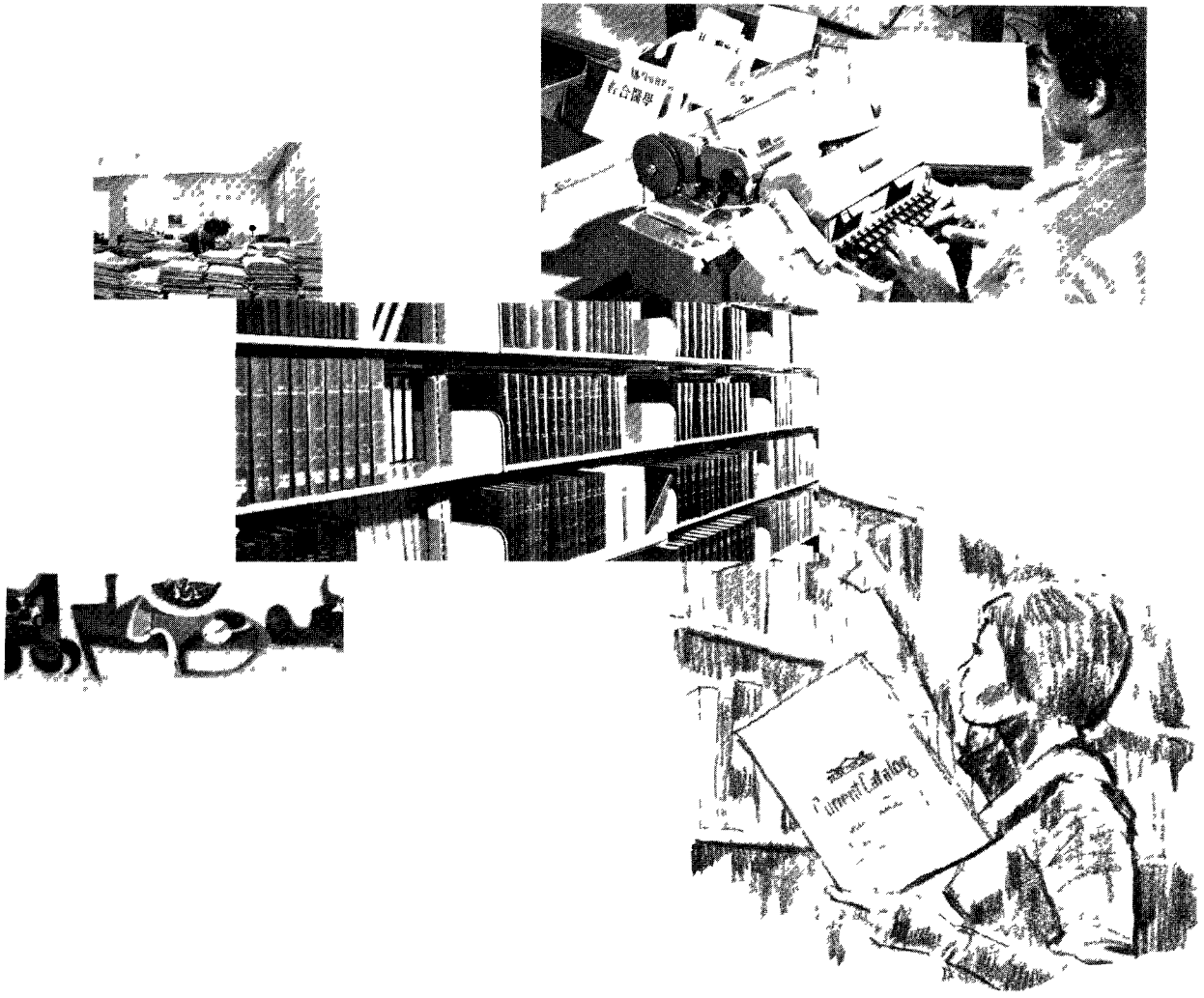
D. The Remote Information Systems Center (RISC) Project

One of the first new activities undertaken by the Research and Development Program was the establishment of the RISC. This center will house on-line communications terminals to provide access to remote computer centers throughout the United States to permit access to remote data banks, to permit on-line programming using the advanced programming languages available at computer centers, and to allow experimentation in several application areas by NLM personnel.

The computer systems currently contemplated for access from the RISC include the COLEX System (Scientific and Technical Intelligence System), the SDC Computer facility at Santa Monica, the Army Chemical Information Data System (CIDS) at Philadelphia, and Project MAC at M.I.T.

E. Planning for the Center for Biomedical Communications

A primary motivation for the establishment of the R&D Program was to acquire the resources for long range planning for the NLM and, in particular, for the Center for Biomedical Communications. The EDUCOM Project personnel have been assisting in planning and preliminary data have been developed for the Center for Biomedical Communications.


Current Catalog

INTRAMURAL PROGRAMS

During Fiscal Year 1967, significant progress was made in establishing new programs, solidifying existing production activities, establishing procedures for reducing growing chronic backlogs, improving quality of services performed, developing functional requirements for the next generation of MEDLARS, and improving the effectiveness of computer operations in order to sustain the Medical Literature Analysis and Retrieval System until initial implementation of the new MEDLARS scheduled for installation early in Fiscal Year 1970.

Personnel ceilings imposed on many Federal institutions early in the fiscal year reduced to critical levels the manpower available for carrying out the production requirements of the intramural programs. Fortunately, a decision in the previous fiscal year to use outside commercial resources for production and the implementation of decentralized MEDLARS stations and decentralized indexing made it possible to maintain many of the intramural program goals. Appointing key management staff in a number of production areas improved effectiveness of operations and compensated in part for manpower losses.

A major reorganization of Technical Services resulted in a more effective deployment of manpower which, by the end of the fiscal year, actually improved services. The use of blanket order agreements for acquisitions began to shift some of the load of acquisitions from the staff, reduced order and claiming workloads. In order to relieve the operational loads, a program was initiated to consolidate the multiple and inefficient serial record files preparatory to automation in the next generation of MEDLARS.

In Reference Services, manpower was shifted from Preservation Filming to Interlibrary Loans. Recruitment of key management staff in Loan and Stack, and in Photoduplication provided increased manpower effectiveness. Measurements of quality and timeliness of reader and Interlibrary Loan services by throughput time controls provided the additional stimulus and motivation for improved functions.

In Bibliographic Services, the manpower constraints widened the gap between the increased inflow of articles to be indexed and the ability of the staff to index. Preliminary experience on a

pilot scale indicated that, with adequately trained staff, high quality indexing could be accomplished on a decentralized basis. A decision to expand outside indexing was made in January 1967. Two indexing activities were established in Japan and Israel to undertake indexing of difficult languages (Oriental and Slavic) which constitute a major portion of the indexing backlog. Indexing activity was also undertaken in some of the MEDLARS Stations. Two additional outside indexing activities, concentrating on foreign language backlog, were established.

Chronic backlogs in demand searches were eliminated by a temporary six-week moratorium on accepting searches and by the establishment of operational search activities at all but one of the MEDLARS Stations. During the second half of FY 1967 these Stations were able to absorb the increased load of search requests without developing new backlogs. In fact, the throughput time for processing demand searches was reduced during the second half of the fiscal year to about two weeks for almost 80 percent of search requests.

Programs for generating recurring bibliographies were radically changed, resulting in greatly reduced processing time for input of citations. More than 70 hours of computer time per month were saved. In addition, MEDLARS was converted from a two-file system to a single-file system resulting in more reliable file maintenance.

Manpower shortages, however, took their toll in the ability to keyboard the citations for entry into the computer. Backlogs rose inexorably in relationship to the manpower deficits. Temporary relief was sought by the use of outside resources for keyboarding the backlog so that current input could be maintained by current staff. A halt in the rising backlog should occur early in FY 1968 and backlogs brought to acceptable levels by the end of the year by library staff.

Implementation of plans to acquire a new computer and a greatly augmented MEDLARS system began in FY 1967. With the aid of a management contract, the requirements for the next generation of MEDLARS were defined, a request for proposal to submit to vendors was completed, and procurement procedures were initiated. A Task Force consisting of 8 full-time professionals from the operating divisions was established to provide the necessary Library resources for these activities. They were relieved from all operating responsibilities, placing an additional stress on operations.

The detailed intramural operations of the Library are outlined in the Division reports which follow.

MeSH REVISION 1967

The 1967 revision was published as Part 2 of the January INDEX MEDICUS. The total number of headings added was 255 and 56 headings were deleted. The provisional heading list was reduced to 473 as a consequence of the revision. The total number of main headings printed in MEDICAL SUBJECT HEADINGS 1967 was 6762. Eleven new subheadings were added, bringing the total to 53. These changes represented substantial reductions from previous years and reflect the impact of major improvements in the vocabulary.

PROVISIONAL HEADINGS

The list of provisional headings with their definitions was revised at the start of 1967 indexing, and monthly supplements have been issued. In addition to the alphabetic lists of new provisional headings and monthly cumulative indexes, the supplements have included monthly updating information for the tree structures.

473 provisional headings remained on Master MeSH after the 1967 revision. Since the revision, 103 provisional headings have been added, for a total of 576 on June 30, 1967.

TREE STRUCTURES

During the second quarter of the fiscal year, major attention was devoted to the development of the tree structures, for which hierarchic classifications were completed before January 1st.

USAGE OF HEADINGS IN INDEXING

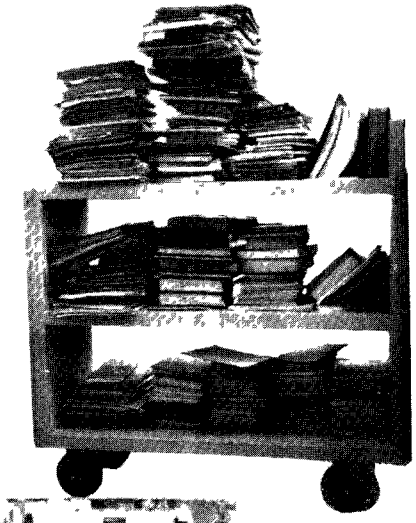
The annual statistical report on the usage of subject headings in MEDLARS showed a ratio of 61.5 INDEX MEDICUS citation entries per heading in comparison with 73.8 in 1965 and 74.8 in 1964.

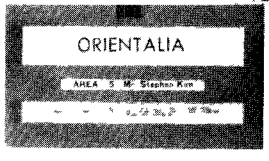
	1964	1965	1966
IM Citations	434,499	465,759	402,908
Non-IM Citations	519,916	518,583	652,317
Total Citations	954,415	1,047,342	1,055,225
Subject Headings	5,812	6,345	6,556
IM Citations/Subject Headings	74.8	73.8	61.5

GROWTH OF HEADINGS ON MASTER MeSH

The distribution according to the several types of entries on June 30, 1967 was as follows:

Main Headings	6,762
Provisional Headings	576
Geographic Headings	262
Check Tags	12
Tag override of 1 headings	391
Sub total	8,003
Cross References (pairs) (Estimated)	3,900
Total	11,903




ORIENTALIA

TECHNICAL SERVICES DIVISION

REORGANIZATION

The selection and acquisition activities, formerly in the Selection and Searching Section and the Acquisition Section, respectively, were brought together in the new Selection/Acquisition Section. Under this new organizational configuration, the area specialists will be responsible not only for the selection of publications for the Library but also for seeing to it that the publications are actually received.

Along with the reorganization, the responsibility for the Exchange Program was assigned to an Exchange Coordinator within the Selection/Acquisition Section.

SPECIAL PROJECTS

1. Consolidation of the serial records files. A contract was let with the J. I. Thompson Co., to develop and establish a consolidated file from the several serial records files currently maintained at great effort by NLM. All data elements found in the several files will be pulled together for each serial title being received. Upon completion of this project, we should have a single complete file with all data elements formatted, and, hence one step closer to an automated system.

2. SUNY/NLM Shared Cataloging Project. Arrangements were completed with the SUNY Upstate Medical Center, Syracuse, New York to:

A. Convert NLM current cataloging tapes to IBM 360/40 and to reformat the NLM data according to the current tape formats to project MARC of the Library of Congress.
B. Provide programs for searching of the resultant tapes using IBM's GIS document handling module.
C. Experiment with batch searches of the resultant tapes.
D. Share input in machine cataloguing data.
E. Cooperate in designing a shared cataloging system.

3. Conversion of 1965 cataloging. A contract was let with MELPAR, Inc. to convert the 1965 cataloging to machine readable form. The 1965 catalog was selected as a possible kick off point for future automation of the catalog primarily because the Library has a duplicate set of cards for 1965 arranged in alphabetical order. The MELPAR staff will be trained by the TSD Cataloging Section. However, under terms of the contract no attempt will be made to use the 1967 MeSH headings or the Anglo-American Cataloging Rules.

ACQUISITION ACTIVITIES

	1965	1966	1967
SEARCHING			
Prospects considered for acquisition, not in Library	27,151	32,919	29,607
Prospects considered for acquisition, Library has	21,470	13,087	9,812
TOTAL	48,621	46,006	39,419
ORDERS PLACED	14,803	14,775	14,552
SERIAL RECORD			
New titles added	1,299	1,925	1,168
Titles currently received (as of end of year)	16,557	18,482	19,650
PUBLICATIONS ADDED			
Serial pieces	77,406	80,611	88,907
Other	13,405	17,839	23,394
TOTAL PUBLICATIONS ADDED	90,811	98,450	112,301
OBLIGATIONS FOR PUBLICATIONS	124,114	161,286	209,900
(Included for rare books)	12,234	26,319	31,095

4. Negotiations were completed for a manually shared cataloging project which will result in the Francis A. Countway Library's acquisitions being included in the CURRENT CATALOG. In FY 1968, the Francis A. Countway Library will begin submitting master forms of their catalog citations for inclusion in the CURRENT CATALOG. Those which are added to the catalog will reflect the NLM classification and MeSH subject headings, as well as the Countway Library symbol, MBCo.

ONGOING ACTIVITIES

1. The Library of Congress and the National Library of Medicine experimented with including NLM subject headings and classification on LC catalog cards for British publications. Since all NLM British publications are procured through the same source as LC and included in air shipments to LC, the Library of Congress cataloged the NLM titles and forwarded the volumes with their manuscripts to NLM. The Catalog Section at NLM added its subject headings and classification to the manuscript cards and returned them to LC. Thus, LC was providing catalog cards for British publications in the biomedical field, which carried both libraries' subject headings and classification.

The experiment proved so successul that the procedure for British publications will not only be continued, but it is anticipated that this shared cataloging will be expanded to include other areas where LC and NLM are using the same sources under blanket order programs.

2. Work began on the revision and expansion of the Library's scope and coverage manual. It is expected to be finished in early 1968.

SELECTION/ACQUISITION SECTION

The blanket order program was expanded during the year and now includes dealers in the following countries: Great Britian, Germany, Netherlands, Scandinavia, Russia, France, Switzerland.

All publications resulting from these blanket orders, with the exception of the Russian, are included in the air shipments to the Library of Congress, since LC also has blanket orders with these dealers.

INDEX MEDICUS journals published in Western Europe are being mailed to a central point in Frankfurt, Germany where the mail parcels are consolidated and then air-shipped to NLM. Shipping time has been reduced from approximately eight weeks to two weeks.

GROWTH OF COLLECTIONS

	CURRENT YEAR			COLLECTION TOTALS	
	Added	Withdrawn	Net Gain	30 June 1966	30 June 1967
BOOK MATERIAL					
1. Bound Monographs					
a. HMD	898	0	898	35,627	36,525
b. 1801-1913	85	0	85	88,537	88,622
c. 1914-	10,499	44	10,455	191,581	202,036
Subtotal (1)	11,482	44	11,438	315,745	327,183
2. Bound Serials	14,835	55	14,780	311,066	325,846
Total Bound Volumes (1 + 2)	26,317	99	26,218	626,811	653,029
3. Theses (including unsearched theses)	5,364	0	5,364	290,519	295,883
4. Pamphlet volumes	51	0	51	167,602	167,653
Subtotal (3 + 4)	5,415	0	5,415	458,121	463,536
TOTAL BOOK MATERIAL	31,732	99	31,633	1,084,932	1,116,565
NON-BOOK MATERIAL					
1. Microfilms	2,271	0	2,271	4,593	6,864
2. Portraits and Pictures	2,301	0	2,301	60,616	62,917
TOTAL NON-BOOK MATERIAL	4,572	0	4,572	65,209	69,781
BOUND VOLUME EQUIVALENTS				15,000	15,000
GRAND TOTAL	36,304	99	36,205	1,165,141	1,201,346

CATALOGING STATISTICS

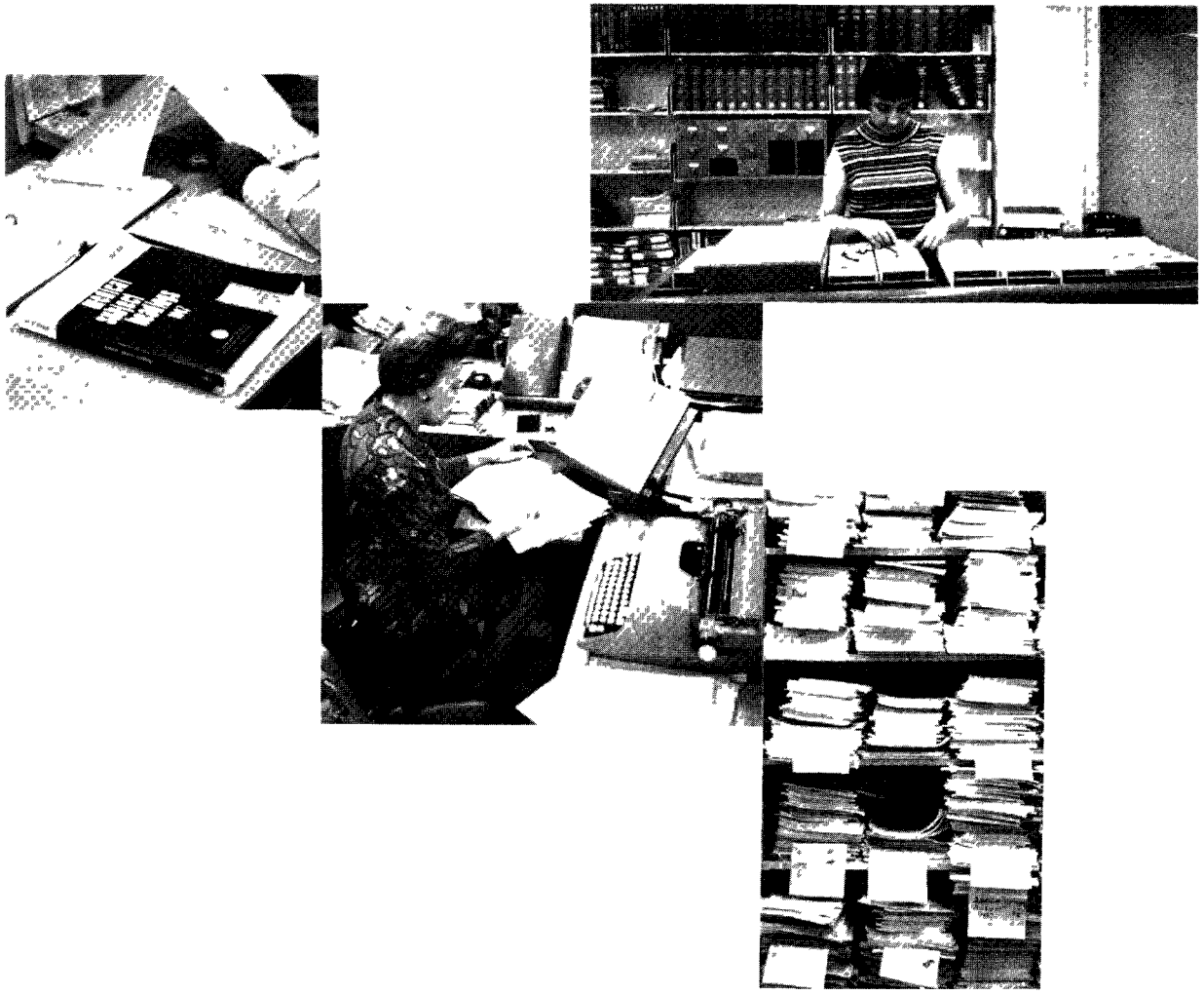
	1965	1966	1967
COMPLETED CATALOGING			
New Titles	10,174	10,063	13,841
Recataloged Titles	4,742	2,160	688
TOTAL	14,916	12,223	14,529
Volumes Reclassified and/or Transferred	2,125	1,959	2,598
Catalog Cards Filed	163,203	210,820	124,224
Volumes Shelflisted	53,697	36,230	15,813

CATALOGING SECTION

FY 1967 was the first complete year for the CURRENT CATALOG. Beginning in January 1967, a subject section with citations listed under main headings was included in the biweekly issues.

The Cataloging Section began to implement some of the changes necessitated by the new Anglo-American Cataloging Rules. The new rules should go a long way toward simplification of the cataloging process, as well as producing a degree of conformity not currently being achieved.

The Section increased its cataloging production of new titles in FY 1967 by 37 percent over FY 1966 (10,063 new monographs and serials in FY 1966 - 13,841 in FY 1967). This was accomplished with one less cataloger on duty in FY 1967.



BIBLIOGRAPHIC SERVICES DIVISION

INDEXING

During FY 1967, 168,310 articles were indexed, compared with 164,545 in FY 1966. Indexing was at the rate of 4.9 articles per hour per indexer, compared with 5.7 articles per hour in fiscal year 1966. The reduced rate reflects at least three factors, including the higher proportion of indexing that is done by trainees and less experienced indexers, the higher proportion of depth indexing done, and the increasing complexity of indexing as MeSH expands and the literature indexed becomes more complex.

The indexing backlog increased from about 40,000 to 70,000 articles. Perhaps 5,000 of the increase may be attributed to our journals being received on a more current basis at the end of the year than at the beginning, and to an improved backlog inventory method. The remainder of the backlog increment, 25,000 articles, represents the discrepancy between our indexing capacity during the year and the number of articles contained in the journals that we have undertaken to index. During the latter part of the year, great priority was given to the indexing of depth journals. Consequently, the growth of the backlog was primarily a growth of non-depth backlog. Our larger backlog therefore contains a smaller proportion of material that is of prime importance to most MEDLARS users. Moreover, because non-depth indexing can be accomplished more rapidly than depth indexing, the effort that will be required to dispose of the backlog increment will not be as great as the mere numbers may suggest.

Thirty persons received indexing training consisting of attendance at the didactic sessions plus two or more months of supervised practice. About twelve of these completed indexing training as background for search training. Nine are now indexing at NLM. Nine were trained for other institutions, primarily Keio University, Japan, and the Parkinson Information Center at Columbia University.

DEMAND SEARCHES

The Number of demand search bibliographies released to MEDLARS users during 1967 was 56 percent greater than in FY 1966. Of the increment of 1700, half were produced entirely in the National Library of Medicine Search Section, and half were formulated at the MEDLARS Stations.

Delays in providing demand search bibliographies were a source of inconvenience and annoyance to users. Therefore, on December 1, 1966, a moratorium was declared, and no further demand search requests were accepted until January 16 1967, when we were able to resume improved services. During this interval, the method of assigning requests to searchers was changed and the workflow was modified. Form letters were developed to serve, as far as possible in place of individually composed letters, explaining the nature of the search retrieval. A better method for the surveillance of throughput time was introduced.

Since the inception of these measures, we have undertaken to assure that at least fifty percent of bibliographies are dispatched within two weeks of the receipt of the request, at least 80 percent within three weeks, and at least 90 percent within four weeks.

Until fall of 1966, searchers at two Regional MEDLARS Stations had previously formulated only the small number of searchers that came from local requestors. The NLM Search Section then began to refer additional searchers to them for formulation. During the first few months of 1967 additional trained searchers began work at the Harvard and University of Alabama Stations, and it became possible to refer searches to them also for formulation. Throughout this year, searches formulated at the Regional Stations have been sent to NLM for computer processing, professional review of the retrieved bibliographies, and analysis for explanation to the user. At the close of the year, this was changed so that searches formulated at the Regional Stations will be returned to the searchers who formulated them for review and release.

During the year, 8 persons completed search training. Six of these are on the staff of MEDLARS Stations, or other institutions processing searches, and two on NLM staff.

Three additional persons were well along in their search training at the close of the year; there are nine search trainees in the class that began its indexing training on June 1, 1967.

Until the beginning of the current year, search trainees were receiving 4 months of instruction, including 2 months of indexing, and 2 months of search. This was felt to provide inadequate search experience, and a 6-month training period was established, consisting of two months of indexing, and four months of search training. However, the training of a searcher cannot end with the com-

pletion of the formal training period. Neither the biomedical sciences nor the MEDLARS stand still. Recognizing this, we have instituted a series of three-day workshops to be held two or three times each year. The first workshop was held in November 1966, and the second in June 1967.

CUMULATED INDEX MEDICUS for 1966 includes citations input through October 1966. The final copy was ready for the printer by the third week in November and the bound volumes were in the hands of subscribers by the first week of February.

One new recurring bibliography began publication during the year: The ARTIFICIAL KIDNEY BIBLIOGRAPHY, appearing quarterly, is produced for publication by the National Institute of Arthritis and Metabolic Diseases. The contents of the first issue was selected from citations that appeared in INDEX MEDICUS for January, February, and March 1967.

	FY 65	FY 66	FY 67
Journals Indexed in Index Medicus	2,241	2,436	2,279
Articles Indexed	151,635	164,545	168,310
Backlog as of June 30	22,870	40,916	70,052
MEDLARS Searches Performed	1,623	3,035	4,733*
Recurring Bibliographies	6	9	10

*Includes 3,889 received at NLM and 844 received at MEDLARS Stations and processed at NLM.

COMMITTEE ON THE SELECTION OF LITERATURE FOR MEDLARS

This year, the Ad Hoc Panel for journal selection for INDEX MEDICUS which had been advising the Library for several years, was augmented, and its name and charge changed. Five new members, including outstanding physicians, teachers, and medical editors, were added to the four distinguished medical librarians who constituted the earlier group. The Committee members now are:

William B. Bean, M.D.
- Professor and Chairman, Department of Internal Medicine, State University of Iowa
- Editor, Archives of Internal Medicine
- Member, Board of Regents, NLM

Morris Fishbein, M.D.
- Editor, Medical World News
- Former Editor, JAMA

Walsh McDermott, M.D.
- Livingston Farrand Professor of Public Health and Preventive Medicine, Cornell University Medical Center
- Editor, American Review of Respiratory Disease
- Member, Board of Regents, NLM

Franz J. Ingelfinger, M.D.
- Professor of Medicine, Boston University School of Medicine
- Editor (Beginning July 1, 1967), New England Journal of Medicine

John H. Talbott, M.D.
- Emeritus Professor of Medicine, University of Buffalo, School of Medicine
- Editor, JAMA

Mr. Thomas P. Fleming
- Professor of Library Service and Medical Librarian, Columbia University
- Consultant to Academic Press, Inc., and to Johnson Reprint Corp.

Mr. William K. Beatty
- Librarian and Professor of Medical Bibliography, Northwestern University Medical School

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

Mrs. Phyllis V. Parkins
- Director and Trustee, Biological Abstracts

The Committee now advises the Library concerning the selection, not only of journals, but of all other types of medical literature which might be considered for inclusion in MEDLARS, or in any of the MEDLARS products. Three meetings of the Committee were held during the year.

INFORMATION SYSTEMS DIVISION

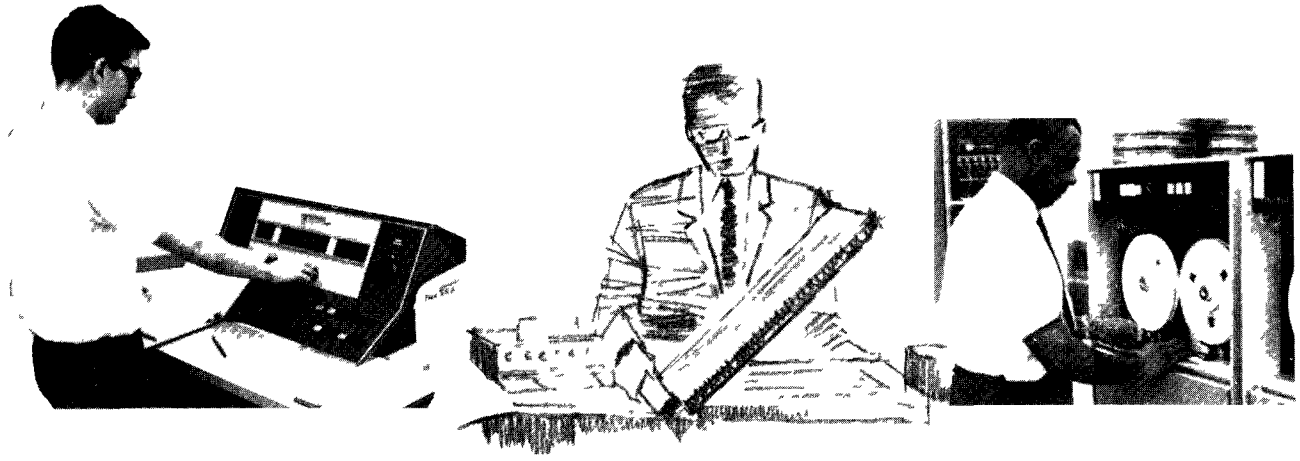
The Compressed Citation File (CCF) contained 596,000 citations on magnetic tape as of June 1967. Because of personnel limitations in keyboarding, the number of references entered into MEDLARS dropped from 166,000 citations in FY 1966 to 149,000 in FY 1967. To achieve and maintain currency, an input of 220,000 to 230,000 citations has been projected for FY 1968.

Demand Searches

Because of the rapid growth of the CCF and a resultant increase in processing time, changes were made to optimize machine time utilization. Changes included (a) providing greater flexibility with regard to search formulation, i.e., tree structures, (b) converting to a punch card format for input of search formulations, (c) insertion of an improved search technique in the programs, which reduced average machine time for a demand search from approximately 44 minutes to 12 minutes (not including an additional 6 minutes which are needed for output preparation, i.e., printing). The projected monthly volume of demand searches for FY 1968 is over 600 per month. The additional growth of the CCF for each quarter of FY 1968 will add approximately 1.5 minutes to the average time per search.

Recurring Bibliographies

All MEDLARS bibliographic products (including recurring bibliographies) are now retrieved from the Compressed Citation File, originally designed for demand search processing. MEDLARS was changed from a two master-file system to a one master-file system. This new process has (a) produced significant net savings in machine time-at least 70 hours per month, (b) reduced file maintenance, (c) resulted in saving search analyst time in the maintenance operation.



Interim Catalog Module

Biweekly issues of the Current Catalog were changed to three-column format and INDEX MEDICUS size in January. The Catalog File contains 21,415 citations covering the period of January 1966 through June 1967.

Computer Utilization

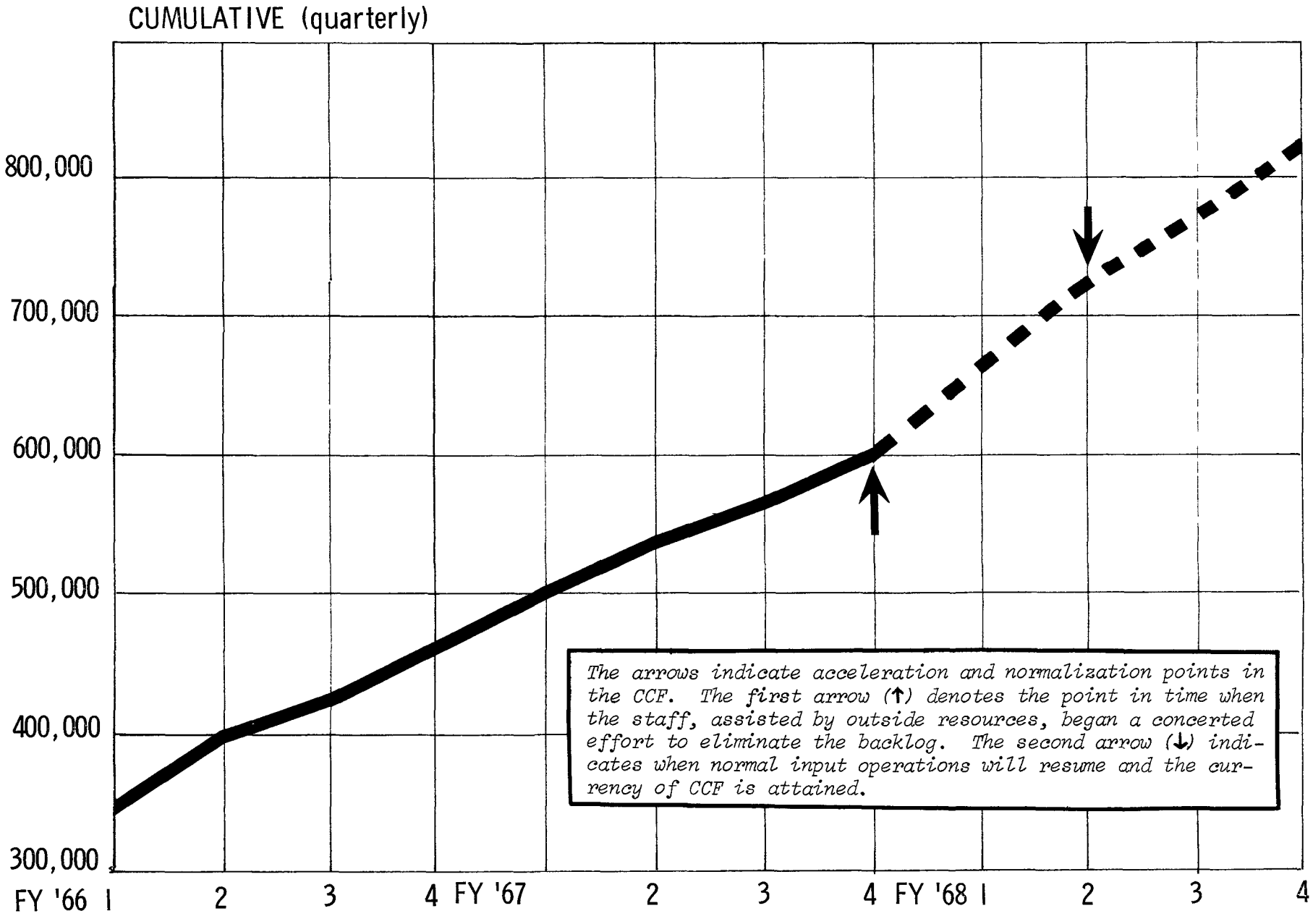
Computer operations continued on a three-shift basis. Programming improvements, however, provided some relief over weekends. Computer "Up" time was good although there was excessive down time in September (which may have been caused by limited preventive maintenance in FY 1966).

GRACE

During FY 1967 an electronic or mechanical difficulty appeared in the Graphic Arts Composing Equipment which caused a number of publications to be late. The malfunction occurred during the period November 1966 through January 1967 and was never isolated or specifically identified, and corrected itself.

At the present time the programming for the Photon 901 is in the final systems testing phase. The matrices for use in the Photon 901 have been ordered from Photon and are expected to be available prior to the preparation of CUMULATED INDEX MEDICUS.

GROWTH OF COMPRESSED CITATION FILE



REFERENCE SERVICES DIVISION

REFERENCE SECTION

SERVICES

The number of readers registered increased 15% over last year, to more than 31,000. The number of call slips processed was 102,000.

FACILITIES

Occupancy of study rooms and study units remained at a maximum. During the year, two additional study units were added making a total of 10; toward the end of the year four additional study rooms were under construction.

An audio-visual facility was established in one of the study rooms attached to the main Reading Room in December 1966. The facility was stocked over the year by a rear-screen projection viewer for single concept films, a microfilm reader, a tape recorder, etc. A card index to the material available was initiated. During the coming year, the collaboration of the National Medical Audiovisual Center will be sought for expansion of the collection.

Toward the end of the year the tile floor, which had presented major maintenance problems in the last year, was covered by wall to wall carpeting. In addition to enhancing the appearance of the room, the carpeting reduced sound levels.

The system of informal spot monitoring of stack delivery service was changed to a constant monitoring system which includes double time-stamping and computation of delivery time from a sample. Average delivery time varied inversely to the number of requests, with weekly levels averaging around 50% completed in 14 minutes, 70% in 18 minutes and 90% in 24 minutes. The goal is still 100% delivery or reporting in 20 minutes.

The number of reference questions answered during the year increased 16% to 25,000. Continued increases were registered in questions answered by telephone (16%) and questions answered for readers (19%), but there was a 4% decline in questions answered in response to letters. A decline in this category had been anticipated in view of the operation of the BSD MEDLARS Search Section.

LOAN AND STACK SECTION

CIRCULATION *(table, page 49)*

The total demand on the collection from requests by readers in-house and for interlibrary loans was almost identical with that of last year.

The interlibrary loan figure includes 9,969 in-house MEDLARS Evaluation Project (see Research and Development Program) requests received. Exclusion of these requests would produce a figure 13,132 less than last year for interlibrary loan requests received from external sources. The decrease in true ILL requests is attributable to more rigid application of rejection policies in FY 1966, which has resulted in submission of fewer rejectable requests, as well as fewer requests overall.

Although Loan and Stack Section had two positions fewer than the previous year, a steady reduction in the number of days required to process completed requests has been achieved.

Shortages of personnel, coupled with a wish to report to borrowers as promptly as possible, reduced the amount of time permitted for searching of items not immediately identified and available. Understandably, the nonavailable rate for interlibrary loans rose.

A large number of requests returned as non-available were for articles in journals being indexed. Two actions to reduce non-availables were taken: additional subscriptions to "high use" journals were placed, and gift and duplicate copies were routed to the Reference Section and the Loan and Stack Section for retention, if the issue was not on the shelf.

TELETYPEWRITER SERVICE

As anticipated, the TWX installation completed in May, 1966 has been more heavily used by borrowers for requesting interlibrary loans. After receiving just under 100 requests via TWX each of the first three months of the fiscal year, the rate more than doubled in October. Over 2,800 TWX requests were filled this year. More libraries are using this service, and by the end of the fiscal year, 78 different libraries had sent requests via this medium. Sixty-six of these had their own TWX machines.

GRAPHIC IMAGE

The major effort of the NLM/NBS Task Force for Graphic Image Study was concentrated in three general areas:

1. Upgrading preservation film image quality and production.

Uniform quality control routines were devised for filming contractors and NLM inspectors, and contractors' quality control equipment calibrated against NBS standards. A procedure for inspection sampling and acceptance quality level was developed. The Task Force cooperated with a film manufacturer in the development of direct duplicating film.

2. Systems analysis for handling microforms.

Theoretical models of graphic image systems were examined from a number of aspects. Several systems built around existing hardware were investigated.

3. Equipment improvements and maintenance.

Equipment development and maintenance tasks included the fabrication of a prototype high resolution camera, a bread-board-model editorial inspection station, and a flat bed camera for special projects; reconstruction of the CopyFlo power system to overcome and overload situation in card stock fusing; and mechanical stabilization and precision focusing of the preservation cameras. Installation of precision light controls and exposure meters on the preservation cameras, a task begun during FY 1966, was completed.

CONTRACT FILMING

Two relatively small microfilming contracts awarded during FY 1966 were expected to test the new NLM specifications and the capabilities of existing microrecording technology. The objectives were feasible though more difficult to attain than anticipated. A more comprehensive proposal was submitted to industry late in FY 1967. Involving filming of current journals as well as older materials, the aim was to encourage solutions to the problem of proprietary rights. Two separate requests for proposals, one for older and the other for recent materials, were sent to 37 firms.

It was decided to continue filming of older materials only, since no acceptable purposals for handling copyright problems with recent materials were received. The 1967 contract, awarded to the Microcard Corporation, is for four million pages. The increase in price of the low and successful bidder was 60% over the cost of the lowest 1966 bid. The increase takes into account the technical and bibliographic problems encountered in filming scientific materials. The experience from these contracts and in-house efforts seems to indicate that microrecording equipment and techniques have developed little over the past quarter century, and that efficient copying of published materials will require a substantial effort on the part of camera and film manufacturers and users as well as improved technology in recording and processing.

Neither of the one million page contracts negotiated during the last half of FY 1966 is completed, though one contractor has completed work on the camera negatives and the other contractor has completed work on 83% of the filming, with completion of this phase scheduled for July 31. These two contracts will add 1,300 reels to the archival collection and an equal number to the Printing Master files. Eighty-four titles (3,100 volumes) will have been filmed. One of the major causes of contract delay was manufacturing and processing problems with direct duplicating film, a new product. A new direct duplicating emulsion recently released by the manufacturer seems to be satisfactory, though shelf life of the unexposed film is dependent on refrigerated storage. 205 reels of duplicate films, mostly copied on the new emulsion, have now been delivered. All inspected were acceptable.

BINDING

	1965	1966	1967
Volumes sent to binder	17,800	18,775	19,177
Volumes returned from binder and processed	18,328	17,773	18,072
New volumes	(14,480)	(15,574)	(15,972)
Rebinds	(3,848)	(2,199)	(2,100)
Volumes bound at NLM	3,425	3,529	5,055
Volumes repaired at NLM	4,138	4,373	4,227
Volumes and pieces lettered	41,037	28,413	16,874
Pieces mounted	82	145	52

PRESERVATION SECTION

A small list of NLM serial titles on film was prepared in June for release to medical libraries. Copies will be available at six dollars per reel. As far as can be ascertained, NLM is the unique scource for microfilm of the listed volumes. The records of the Copyright Office were checked for assurance that all are in the public domain.

PHOTODUPLICATION SECTION *(table, page 50)*

The most significant change in Photoduplication during the past year was a cut-back in preservation film in activities to absorb a loss of two positions and to keep abreast of sharp increases in production of film and paper products of GRACE, and of catalog cards, as well as time-consuming inspection activities related to contract filming.

MICROFILMING

Total microfilming production declined by 275,000 filming units, a drop of 8%. Card filming was up by 187,000 cards, but filming for Preservation decreased by 277,000 pages, and ILL filming decreased by 149,000 pages.

FILM AND PAPER PROCESSING

Processing of photo-typesetting film and paper products from GRACE increased by almost 40,000 pages (including pages of photocomposed cards) over the previous year. Processing of the 96,000 units required 1,248 production runs.

Microfilm processing increased by 15% from 158,000 to 182,000 feet, the increase resulting from expansion of card production. The number of production runs increased 40% from 864 to 1,209. Part of this increase was due to smaller batches as a method for improving ILL throughput time.

A Remington-Rand Unipro Mark II microfilm processor was obtained late in the year. Not yet installed, the machine was acquired to produce archival quality images from in-house preservation film, and to develop techniques for low contrast processing and image enhancement. This will substantially increase the in-house processing load next year.

HARD COPY PRODUCTION

Hard copy production rose to 2,397,000 pages this year, an increase of 31,000 pages over the previous year. (Of this figure, less than 4,000 pages were produced by reader-printers and photostat.) While Copy Flo production decreased by 98,000 pages, Xerox 914 usage climbed by 131,000 exposures, due in large part to needs of the expanding business operations of the Library.

CARD PRODUCTION

Xerographic card production increased by over 100%, from 222,000 to 448,000 cards. Included in this total were 270,000 cards for the name, subject, and shelflist files, 114,000 cards for the selection and ordering processes, and 64,000 Indexer Authority cards for the decentralized MEDLARS Stations.

FILM DUPLICATION

Production of direct image films on Kalvar was plagued all year long by problems with film stock. Late in the year, the manufacturer decided to remove the product from the market pending further intensive research. Alternate methods of producing copies of NLM films are now being explored. During the last year, 611 reels of film were duplicated on Kalvar.

REFERENCE SERVICES

		1965	1966	1967
Requests by Telephone		9,810	9,971	11,636
Government		(5,621)	(5,381)	(5,731)
Non-Government		(4,189)	(4,590)	(5,905)
Requests by Mail		2,077	1,489	1,418
Government		274	192	221
Non-Government		(1,803)	(1,297)	(1,197)
Readers Assisted		9,044	10,411	12,460
Government		(3,650)	(3,934)	(4,453)
Non-Government		(5,394)	(6,477)	(8,007)
	TOTAL	20,931	21,871	25,514
Government		(9,545)	(9,507)	(10,405)
Non-Government		(11,386)	(12,364)	(15,109)
Readers counted		26,779	27,418	31,666

PICTORIAL SERVICE

Responsibility for pictorial service reverted to RSD on September 1, 1966. For a number years pictorial work has frequently been subject to long service delays because of limited facilities and extreme variations in workloads. Since February, unusual situations have been handled by sending negatives to a commercial laboratory for print production. This procedure has virtually eliminated the long delays. A total of 3,697 prints, negatives and slides was processed during the year.

EQUIPMENT

New equipment received during the year includes two microfiche readers, a film viewer, a film processor, color print processor, and an electronic cutter.

CIRCULATION STATISTICS 1967

	1965	1966	1967
Requests received	263,464	278,340	278,580
Requests filled	229,297	243,424	239,857
Requests unfilled	34,167	34,916	38,723
Rejected	(1,218)	(8,652)	(3,446)
N.A.	(32,949)	(26,264)	(35,277)
Percentage of requests filled	87.0%	84.4%	86.1%
ITEMS USED BY MAJOR CATEGORY			
Reader's request	80,739	91,537	91,622
Interlibrary Loans	148,558	151,787	148,235
Photocopy	(142,452)	(145,452)	(141,230)
Original	(6,106)	(6,711)	(7,005)

UNAVAILABLES	By percentage of total unavailables			By percentage of total requests accepted		
	1965	1966	1967	1965	1966	1967
Already on loan	8.4	10.5	9.4	1.1	1.0	1.2
Not in collection	29.8	34.4	28.4	3.7	3.4	3.6
At bindery	20.0	12.4	6.1	2.4	1.2	0.8
Missing	22.8	3.4	28.9	2.8	0.3	3.7
Does not circulate	5.1	5.9	5.3	0.6	0.5	0.7
Not identified	4.4	6.2	5.8	0.6	0.6	0.8
In process	9.5	27.2	16.1	1.2	2.7	2.1
	100.0	100.0	100.0	12.4	9.7	12.9

PHOTOGRAPHIC SERVICES

TABLE I - EXTERNAL ORDERS

	1965	1966	1967
EXTERNAL ORDERS COMPLETED	143,374	145,295	141,893
By type of order:			
Interlibrary loan	(142,452)	(145,076)	(132,112)
Coupon, paid, special	(922)	(219)	(663)
MEDLARS Evaluation	(0)	(0)	(9,118)
By type of service:			
Microfilm	(33)	(27)	(1,750)
CopyFlo	(140,093)	(141,575)	(133,175)
Photostat	(722)	(278)	(135)
Xerox 914 Copier	(1,969)	(2,950)	(6,430)
Photoprints	(423)	(339)	(235)
Photographs and slides	(134)	(126)	(168)
PAGES DUPLICATED FOR ORDERS			
Microfilm:	2,094,823	2,074,353	1,925,469
For CopyFlo orders	(2,084,074)	(2,069,165)	(1,890,007)
For microfilm orders	(10,749)	(5,188)	(35,462)
CopyFlo (from film file	13,948	7,848	96,070
Photostat	3,250	1,300	736
Xerox 914 Copier	17,919	26,201	46,938
Photoprints	3,073	3,481	1,701
Photographs and slides	933	765	1,301
TOTAL	2,133,946	2,113,948	2,072,215

PHOTOGRAPHIC SERVICES

TABLE II - INTERNAL ORDERS

	1965	1966	1967
Microfilm pages	729,235	1,302,092	988,394
For film file	(212,498)	(190,378)	(158,502)
For poor paper program	(480,011)	(1,102,837)	(825,030)
For interoffice orders	(36,726)	(8,877)	(4,862)
Paper reproduction pages	258,212	258,097	362,274
Photostat	(696)	(1,071)	(1,374)
CopyFlo	(51,542)	(37,569)	(31,090)
Photoprints	(8)	(8)	(12)
Xerox 914 Copier	(205,966)	(219,449)	(329,798)
Photographs and slides	2,471	3,555	2,396
Cards - Microfilm	137,236	222,090	409,513
- CopyFlo	125,621	222,203	448,321

TABLE III - TOTAL PRODUCTION

	1965	1966	1967
Microfilm	2,824,058	3,376,445	2,913,853
CopyFlo pages	2,149,564	2,114,582	2,017,167
Photostat pages	3,946	2,371	2,110
Xerox 914 Copier	223,885	245,650	376,736
Photoprints	3,081	3,489	1,713
Photographs and slides	3,404	4,320	3,697
Cards - Microfilm	137,236	222,090	409,513
- CopyFlo	125,621	222,203	448,321

TABLE IV - ORDERS COMPLETED AS INTERLIBRARY LOANS

	1967		
	GOVERNMENT	NON-GOVERNMENT	TOTAL
Metropolitan Washington	17,011	6,707	23,718
Outside Washington (U.S.A.)	23,371	53,891	77,262
Overseas	6,010	25,122	31,132
TOTAL	46,392	85,720	132,112

HISTORY OF MEDICINE STATISTICS

	1965	1966	1967
ACQUISITIONS			
Books	226	245	549
Early MSS.	113	153	149
Modern MSS.	*	23,257	25,755
Oral History Hours	0	0	85
Pictures	298	1,433	2,362
PROCESSING			
Books Cataloged	2,149	722	1,809
Entries Established (18th c.)	1,525	1,319	1,604
Early MSS.	0	0	2,394
Modern MSS.	*	*	44,300
Oral History Collections	0	0	17
Pictures Indexed/Cataloged	298	1,546	3,637
Pages filmed	215,120	171,264	141,147
PUBLIC SERVICE			
Reference questions (publications)	*	847	1,338
Reference questions (pictorial)	196	241	396
ILL and photoduplication	497	823	707
Reader requests	1,103	2,588	3,193
Pictures supplied	1,090	597	1,656

* Not counted

HISTORY OF MEDICINE DIVISION

EARLY MANUSCRIPTS

ACQUISITON

During the past year, microfilms of selected medical manuscripts have been acquired from the following European libraries: Bibliothèque Royal, Bruxelles; the Burgerbibliothek, Bern; the Bibliotheca Ambrosiana, Milan; the Bodleian Library and Merton College, Oxford; and the Österreichische Nationalbibliothek, Vienna. With the addition of these items to those acquired in the previous two years, the Library now has the nucleus of an important collection of medieval medical texts.

PROCESSING

Cataloging of these manuscripts was begun intensively in September, 1966. By June the Curator of Early Western Manuscripts, Mr. Richard J. Durling, in addition to other activities, had processed some 7600 feet of microfilm and cataloged a total of 2,394 texts contained in manuscripts ranging in date from the eighth to the fifteenth centuries. A total of 179 codices from the Vatican and Bibliothèque National, and 71 from the British Museum, Merton College, and Österreichische Nationalbibliothek have been examined to date. A special catelog arranged in five sections records all texts whose authorship can be established; anonymous texts; provenance; incipits; shelflist of microfilm reel numbers and the codices contained. Available at present only to visitors to HMD, it will eventually be published in abbreviated form.

EARLY IMPRINTS

ACQUISITIONS

In Fiscal Year 1966, the Library checked a steadily declining trend in the acquisition of early imprints for the historical collections. In the past year, then number of new acquisitions, 549, was the highest figure since 1959, when prices were considerably lower. This increase reflects in large measure the increased funds avilable for purchase. It also includes a number of gifts; for these we are indebted to Dr. Stanhope Bayne-Jones, Dr. Edward Cushing, Dr. Saul Jarcho, Dr. Robert B. Livingston, and Mr. Benjamin S. Richmond.

Examination of the material so far processed shows that the traditional picture of medieval medicine as largely subservient to authorities is correct. The same texts by Hippocrates, Galen, Theophilus Protospatharius, and Isaac Israeli occur over and over again. Nevertheless, the Curator has discovered a number of unrecorded commentaries on Galenic treatises by Mundinus and Alberto dei Zancari, hitherto unknown manuscripts of CONSILIA and QUESTIONES by Gentile da Foligno, and a complete copy of Taddeo Alderotti's GLOSSES on Hippocrates' PROGNOSTICS in a 14th century Cesena manuscript. Lynn Thorndike and Pearl Kibre, A Catalogue of Incipits of Mediaeval Scientific Writings in Latin (Cambridge, Mass., 1963) lists only the NLM's incomplete manuscript of this work. In addition, the Curator has been able to correct or supplement Thorn-

dike's listing of manuscripts in innumerable instances.

SCOPE

The HMD collections heretofore have consisted primarily of European works printed before 1801 and American imprints before 1821. To provide the improved security and special handling possible in a relatively small collection, the decision was made late in the year to transfer to HMD all of the Library's imprints through 1870, along with other special collections of pamphlets and theses. Transfer of the collections is expected to take place during the coming July.

CATALOGING

The catalog of the 16th century collection is in press and is scheduled to appear in August, 1967. Cataloging of the 17th century collection showed steady though not spectacular progress.

The project to unify the file of 18th century holdings through establishment of main entry without full cataloging is also showing steady progress. The first phase, unification of the name catalog and so-called checklist, is approaching completion and will be finished during the coming year. Started in FY 1964, this project will have resulted in the establishment of entry for approximately 20,000 items at a cost of approximately 4 man-years of professional time. A start was also made this year on cataloging 18th century pamphlets, hitherto unrepresented in HMD's card files.

CIRCULATION AND SERVICE

Overall use of the collection has continued to rise. Although interlibrary loan and pay orders declined slightly, reader use more than compensated, leading to an overall circulation increase of 14.3 per cent (from 3411 to 3900). Reference inquiries (other than pictorial) addressed to HMD increased 58 per cent (from 847 to 1338).

ORAL HISTORY

Consisting essentially of carefully prepared, tape-recorded, and transcribed interviews with persons who have made distinguished contributions to the development of medicine or who have shared in significant events, oral history is a technique designed to preserve knowledge locked in individuals' memories that otherwise would not be recorded.

In September, 1966, Dr. Peter D. Olch joined the staff of HMD as Deputy Chief with special responsibility for the development of the oral history program.

At various times during the past year, names of persons "who should be candidates for an oral history interview" have been offered to the Division. However well selected the candidates may have been, personnel limitations clearly made it undesirable to spread the program thinly over a number of disparate fields. Rather, HMD decided to concentrate on a single subject area chosen to utilize best the existing background, knowledge, and interests of the interviewer. Because of the interviewer's other duties, it was also decided to carry out a larger number of relatively short interviews of one to five hours rather than a single, long study in depth.

Accordingly, Dr. Olch has planned a series of interviews with leading surgeons and others with particular reference to the history and training of surgeons and the history of their professional organizations from about 1920 to the present. Initial interviews totaling 7 hours have been carried out with several persons connected with early surgical training programs at the Johns Hopkins University.

CONTRACT PROGRAM

In order to develop the oral history collections more rapidly, the contract program initiated late in FY 1966 through the Extramural Program has been enlarged. The contract with Dr. Harlan Phillips led to the acquisition in April, 1967, of a five-volume memoir of Dr. Stanhope Bayne-Jones and 9 reels (51 1/2 hours) of magnetic tape. At the same time Dr. Bayne-Jones presented an extensive collection of personal papers, greatly increasing the overall value of the memoir for purposes of historical research. Dr. Phillips is continuing to work under an Extramural Program contract on additional interviews.

In May, 1967, the Library entered into a contract with Emory University for support of an oral history study of the Food and Drug Administration, to be carried out by Professor James Harvey Young. The Library is to receive approximately 150 interview hours of tape recordings and transcripts.

DEPOSITORY PROGRAM

To preserve valuable and often unique historical records and to make them more accessible to future users, HMD is also acquiring appropriate tape-recorded interviews carried out by others as gifts or on loan for duplication.

DEVELOPMENT OF FIELD

Besides creating its own collection, HMD is gathering information on the location and availability of existing materials elsewhere, not only to prevent duplication of effort but also to act as a central locus for information in this field.

As a relatively new field, oral history is beset with many problems, among them those of definition, standards, and evaluation. To promote discussion of mutual concerns, the UCLA Oral History Program sponsored the First National Colloquium on Oral History in September, 1966.

MODERN MANUSCRIPTS

Like the oral history program, the modern manuscripts program is aimed at the preservation of relatively recent sources for the history of medicine for the use of scholars interested in the history of the 19th and 20th centuries. When possible, the two complement each other, since a special effort is made to acquire papers from persons who have been interviewed. In this way the scholar will find more of his material gathered in one place.

ACQUISITIONS

The largest collection received during the year was the gift of personal papers from Dr. Bayne-Jones, to accompany his oral history memoir. Of particular interest to the Library was a collection of approximately 1200 items of correspondence to and from Fielding H. Garrison, presented by Mrs. Janet Teach. A collection of papers and other memorabilia of John Louis William Thudichum was received from Dr. Robert B. Livingston and Dr. Irvine H. Page. Mrs. Wallace Carroll gave a collection of the diaries and correspondence of Dr. Wilbur A. Sawyer, through Dr. Fred L. Soper. Dr. William B. Bean donated an extensive collection of correspondence. Other welcome gifts were received from the Baltimore City Hospital, Miss Eleanor G. Coit, Dr. Edward H. Cushing, Dr. C. C. Dauer, Dr. Ernest C. Faust, Dr. Chauncey D. Leake, Mr. Morris C. Leikind, Dr. Irvine H. Page, Mrs. S. Maus Purple, and Mr. Theodore Wiprud. Accessions for the year totaled an estimated 25,755 items in 23 transactions.

PROCESSING

At the end of the year there remained to be processed an estimated 45,000 items from the Library's archival materials, as well as some of the new acquisitions.

ACQUISITIONS

About 150 items ranging in date from 1550 to 1900 were ordered. A significant number of contemporary original prints of medical interest, which have hitherto been largely unrepresented in the collection, have also been added. The artists represented include Leonard Baskin, Jack Perlmutter, William Sharp, and Robert Riggs.

CATALOGING AND INDEXING

During the year, nearly all backlogged acquisitions in the collection were cataloged. Several albums, 1100 color slides of medieval manuscript illustrations collected by Loren MacKinney, and materials in other parts of the Library were indexed. A project to examine runs of selected 19th century illustrated journals in the Library of Congress began with HARPER'S WEEKLY. Illustrations of medical interest were indexed and negatives ordered, providing a much needed resource for 19th century pictorial material.

REFERENCE AND CIRCULATION

The number of requests for pictorial reference service increased from 241 in 1966 to 396 in 1967. Although the majority of reference requests are still received by letter or telephone, the number of persons visiting the collection and requiring more time in public service is also increasing. To meet the larger demand, the Curator, in addition to indexing, has prepared several lists of pictorial material on subjects for which repeat requests are likely. One list, of dental prints, was revised and expanded and will be issued as a 32-page illustrated booklet. An introduction to the collection, published in VISUAL MEDICINE, the NLM NEWS, and the MEDICAL ANNALS OF THE DISTRICT OF COLUMBIA, is also in press as a general information brochure. Reproductions of prints from the collection were used on covers of both the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION. Production of photographs was greatly speeded by the use of an outside contractor for the preparation of prints from the Library's negatives. Overall, increased demand and improved production resulted in a total of 1656 prints and slides being supplied to outside patrons, compared to 1090 in 1965, the previous maximum, and only 597 last year.

PRESERVATION

A program for improved preservation of the fine print collection through proper matting and other protective measures, inaugurated late last year, was suspended during most of the year because of the cutback in personnel. The employment of one summer aid through the Youth Opportunity Program made it possible to take this up again in June.

A contract to prepare a master file print for each negative in the Library's collection of approximately 12,000 negatives was negotiated late in the year. This will improve preservation of the file by lessening handling of the negatives and, more important, enhance reference service and use of the file.

BIBLIOGRAPHY

The first annual BIBLIOGRAPHY OF THE HISTORY OF MEDICINE, covering works on the history of medicine and related topics indexed in 1965, appeared in November 1966. Altogether, it contained approximately 2460 citations, including both monographs and journal articles, arranged in three sections: biographic index, subject index (with chronological and/or geographical subdivisions as appropriate), and author index. The bibliography thus offers medical historians a variety of approaches to the literature. An international index, it covers the medicine of all times and places, and includes works published in all parts of the world. Most of the citations were taken from MEDLARS, through the medium of a monthly "recurring bibliography" of all biographical and historical articles. To these were added selected monographs from the Library's regular acquisitions and citations culled from bibliographies in other fields--such as classics and general history--not covered by the Library's other indexing services.

RESEARCH

One function of the History of Medicine Division is research in the history of medicine. Although other duties have absorbed nearly all of staff time, it has been possible for some members to carry on some independent research, much of it on their own free time. Thus the Chief of the Division has devoted some time to study of American anatomy acts, which formed the basis for the Beaumont Lecture presented at Yale University in April. The Deputy Chief, Dr. Olch, is continuing his studies on the life of William Stewart Halsted. During the year, he published an article on Halsted's New York period in the BULLETIN OF THE HISTORY OF MEDICINE and presented a paper on Halsted and private practice at the American Association for the History of Medicine. The Curator of Early Western Manuscripts has in press an article based on his researches in the Vatican manuscripts received at the Library which is to be published in TRADITIO, and another article, on the Latin translation of Galen's ARS PARVA, which is to appear in CLASSICAL PHILOGY. In addition to the publications listed in this report, members of the staff have contributed book reviews to such journals as the BULLETIN OF THE HISTORY OF MEDICINE, JOURNAL OF THE HISTORY OF MEDICINE, ISIS, and the AMERICAN HISTORICAL REVIEW.

EXTRAMURAL PROGRAMS

Financial Statistics

Program		No. of Awards	Amount
Research:	Grants	29	$ 574,662
	Contracts	12	775,041
Publications:	Grants	14	396,697
	Contracts	5	174,395
Training		17	826,912
Special Scientific Projects		2	36,140
Resources		258	3,335,700
Regional Medical Libraries		1	104,872
Construction*		0	0
			$6,224,419

*Nine of 28 applications were approved. Funds were not available to make awards.

EXTRAMURAL PROGRAMS

PREFACE

Knowledge in health sciences is discovered and developed through research; it is disseminated through teaching and publishing; and it is applied through service. The health sciences library is a most essential instrument in assisting and supporting the discovery, preservation, dissemination, and application of knowledge; but a library cannot be an effective instrument through passive and isolated existence. There is an urgent requirement for continous aggressive and progressive action by every health science library in a planned and concerted action to establish a national health sciences information system. The Medical Library Assistance Act of 1965 authorizes Federal financial support to encourage and assist the development, establishment, and growth of a national health sciences information network. This Act authorizes grant support for the construction and renovation of medical library facilities, librarians, and other health science information personnel, the conduct of research on new techniques and systems for the organization and dissemination of health sciences information, and the development of regional medical libraries. The major responsibilities of NLM Extramural Programs include administration of the Medical Library Assistance Act of 1965.

The ultimate goal of the Extramural Programs is to encourage and assist the development of a total nationwide system which will enable the continuous effective flow of biomedical information from the point of origin to the user in research, education, and medical practice so that all medical knowledge can be applied to the fullest extent in the improvement of health. The programs aimed at achieving this goal include financial support and assistance for the construction and enlargement of facilities, the improvement and expansion of present collections of health sciences information materials, and the training of health sciences information specialists who can create and administer the many facilities required for an active and effective total biomedical information network.

BIOMEDICAL COMMUNICATIONS RESEARCH

The Medical Library Assistance Act states that "much of the value of the ever-increasing volume of knowledge and information which has been, and continues to be developed in the health science field will be lost unless proper measures are taken in the immediate future to develop facilities and techniques necessary to collect, preserve, store, process, retrieve, and facilitate the dissemination and utilization of such knowledge and information." The Act authorizes support of a program to assist in conducting of research on medical library problems and to aid the development of new techniques, systems, and equipment for processing, organizing, storing, retrieving, and disseminating information in the health sciences.

During FY 1967 the Research and Training Division supported 41 research and development projects and studies by grant and contract. The focus of some of the major projects is indicated by the following project titles:

- Relationships of biomedical information services
- Experimental dissemination of biomedical literature
- Total system computer program for medical libraries
- Automatic indexing of drug information
- Experiment on information environments of researchers
- Research on the effective utilization of medical information
- Cost-effectiveness of human and computer indexing rules
- Development and testing of methods for evaluation of biomedical libraries
- Preparation of self-instructional educational materials for practicing physician.

Important research studies on the flow of information and the communication processes in a general hospital, the relationship between the user of biomedical information and the institutional sources of such information (including relationships of intraregional sources), and the effectiveness of taped self-instructional units with associated visuals, are among those being supported.

The Extramural Program responsibility and authority includes the support of research and training in history of the life sciences. During FY 1967 about twenty projects of a historical nature were supported by grants. The range of topics include biographical studies, local and regional medical histories, and the history of specific diseases.

MANPOWER TRAINING AND DEVELOPMENT PROGRAM

The President's Commission on Heart Disease, Cancer, and Stroke in 1965, in a special report on a program for developing medical libraries stated that "Ways must be found to attract much larger numbers of people into careers in medical librarianship and related fields. Equally important, however, is the need to attract those of unusual ability and creativity who can provide leadership in the future....It is essential that these leaders in the medical library field possess the capability for planning and designing future medical information and communications systems. The ability to deal with abstractions, to understand the logic and structure of bibliographic tools, and the science and technology of information handling are attributes necessary for this planning and design function. Such capabilities are presently in short supply in the library profession."

TRAINING GRANTS

The Library's training grants program, authorized by the Medical Library Assistance Act and administered by the Research and Training Division, gives high priority to the support of a limited number of carefully selected graduate and postgraduate training centers of excellence located in schools of library science, medical schools, and other professional and graduate schools. These programs give special emphasis to the planning, development, and management of medical information systems. Various disciplines are involved in the programs including biomedical sciences, library management, mathematics, systems engineering, and linguistics. Such training activities are developed in conjunction with strong biomedical programs so that the scholarly research pursued by the graduate students in medical librarianship or information science can be conducted in an appropriate environment.

In FY 1967 academic programs in biomedical librarianship were supported by grant at five universities; five internship programs have also been funded. With the growth and expansion of these ten programs and the initiation of additional new programs in other institutions, a significant and increasing number of librarians will be trained for leadership roles in the development and operation of health science libraries.

MANPOWER STUDIES

In response to the need for current objective information on present manpower problems and to develop systematic programs for the future the National Library of Medicine (Research and Training Division), the U.S. Office of Education and the National Science Foundation joined in negotiating a contract with Dr. Paul Wasserman, Dean of the School of Library and Information Services, University of Maryland, for the support of a comprehensive program of research on identification of manpower requirements, educational needs, and the utlization patterns of manpower in the library and information professions.

In the area of medical library manpower and training problems, a grant was made to the University of Washington School of Librarianship for a study conference on medical library training programs, trends, and prospects. A grant was made to the Western Reserve University Center for Documentation and Communication Research for a feasibility study of continuing education for medical librarians. Additional studies in the area are being developed.

PUBLICATIONS AND TRANSLATIONS PROGRAM

DOMESTIC

A program to provide assistance for biomedical publications of a nonprofit nature was authorized by the Medical Library Assistance Act of 1965. The purpose of this program is to assist the health-related professions by making available to them information of significance to the national health effort. The scope of the program includes publications generally referred to as secondary literature in all scientific areas related to health.

The major areas of program accomplishment during FY 1967 included: 1) the formulation of guidelines and administrative mechanisms to further improve and expedite the application, review and approval processes; 2) an increase in number and scope of publication activities supported; 3) strengthening and broadening contacts and cooperative efforts with other PHS funding units, and 4) promotion of information about the program.

The increase in the size and scope of the grant program is indicated by the broad range of the projects being supported, covering many different disciplines and subject areas related to health and many types of secondary publications.

The Publications and Translations Division developed contacts with other units of PHS having mission-oriented programs. A conference sponsored by the NLM Extramural Programs brought together all major elements of the PHS, including representatives of all Institutes at NIH, to exchange information on the program interests and policies of the various units in extramural support of publications. The discussions at the conference confirmed the NLM position that it has a unique role within the PHS in the extramural support of publication-related activities.

Contacts were made with other federal agencies and with non-federal groups and organizations including university presses and biomedical information services to acquaint them with the program, to discuss problems of mutual concern, and to identify areas where program effort is needed.

Grant Program

The program is currently supporting secondary publication projects in the following: biomedicine (general), cardiovascular medicine, dental health, environmental health, epidemiology, growth and development, medical entomology, metabolism, microbiology, pharmacology, reproductive biology, toxicology, tropical medicine, and veterinary medicine. The publications take the form of abstracts, an atlas, bibliographies, catalogs, handbooks, indexes, monographic reviews, and translations. Most of the projects are discipline-oriented and not concerned with a specific disease entity.

PUBLICATION CONTRACTS

During FY 1967 several new contracts were negotiated, a number of previously supported projects were continued, and two contracts were terminated. The new contracts include a project with the Association of American Medical Colleges for publication, as supplements to the JOURNAL OF MEDICAL EDUCATION, of three cumulative bibliographies on Medical Education covering the period from 1964 through 1967, and

a project for the publication of a report entitled "The Health Sciences Library; Its Role in Education for the Health Professions," also to be published as a supplement to the JOURNAL OF MEDICAL EDUCATION. The latter report was prepared under a previous contract awarded by the NLM Extramural Programs.

Existing contracts that were renewed or amended include: 1) preparation of 10,000 abstracts of Soviet health-related articles for publication in BIOLOGICAL ABSTRACTS; 2) preparation of Soviet and Japanese abstracts in the clinical and preclinical disciplines for publication in the abstracting journals of EXCERPTA MEDICA; and 3) the preparation of a selective annotated bibliography on schistosomiasis.

The contract with the Clearinghouse for Federal Scientific and Technical Information (CFSTI), U.S. Department of Commerce, for preparation of the BIBLIOGRAPHY OF MEDICAL TRANSLATIONS (BMT), was terminated as of December 31, 1966. The BMT has been developed to serve as a specialized announcement service to assist U.S. health scientists in identifying translations of interest. The project was discontinued because, in the light of sharply rising production costs, its usefulness was judged not to justify the increased expense. An index to the 1965 issues of the BMT is being printed and will be distributed during FY 1968 as the final phase of this project.

Publications Resulting from Grant and Contract Support

During FY 1967 several publications were issued including two volumes of the BIBLIOGRAPHY OF MEDICAL EDUCATION covering the years 1964-5 and 1967 and a quarterly bibliography on medical entomology.

Five publications were in production as of the end of the fiscal year: a comprehensive BIBLIOGRAPHY ON SCHISTOSOMIASIS, a UNION CATALOG OF MEDICAL PERIODICALS, volume 13 of the ARCTIC BIBLIOGRAPHY, a translation of a Russian book on epidemiology, and a monographic review to be published in THE QUARTERLY REVIEW OF BIOLOGY.

INTERNATIONAL

Under the authorities of the Agricultural Trade Development and Assistance Act, the Medical Library Assistance Act, and appropriate titles of the Public Health Service Act, and in keeping with the National Policy Statement on International Book and Library Activities of 1967, projects formulated under the Special Foreign Currency Program emphasize contributions to encourage the exchange of biomedical information internationally, to the mutual benefit of American scientists and their counterparts abroad.

Activities now in progress include the preparation of critical reviews, indexer training at NLM and subsequent indexing for the Library in PI 480 countries, publication of a specialized abstract journal for foreign-language drug literature, production abroad of abstracts on drug literature and dental research literature for agencies in the United States, and the translation and distribution of selected reports and monographs in the health sciences.

Critical Reviews

In July 1966 the Principal Medical Library, Warsaw, Poland, the Polish Ministry of Health and Social Welfare, and NLM signed agreements for three critical reviews in selected areas of industrial toxicology, hematology, and rehabilitation. First progress reports on the reviews were sent from Poland in January 1967 and completion of the reviews in manuscript is expected in FY 1968.

Two more critical review proposals have been approved and forwarded to Poland for signature. A sixth critical review proposal has been accepted by the Library, and will be submitted to Poland for signature in fiscal 1968, pending availability of funds.

An agreement for a critical review program, indexing, and related scholarly activities, between the NLM and the ISRAEL JOURNAL OF MEDICAL SCIENCES (IJMS) was negotiated in FY 1967. The IJMS editor and Editorial Board accept and consider applications in Israel for critical review and history of medicine projects. Approved applications are submitted to NLM for further consideration. Applicants for indexer training at NLM are also screened in Israel, and trained indexers are supported under the agreement to work in Israel for NLM. During FY 67 two indexer trainees were selected; one has completed training, and a second will be trained at the Library early in fiscal 1968.

Abstracts

In FY 1967 the Library supported two studies in the United States to evaluate DRUG DIGESTS. The reports of both studies recommended changes in format and coverage which staff members are considering. This experimental NLM-supported publication, prepared in Israel, contains 50 digests per month from the foreign language drug literature. Twenty-two issues of this journal have now been distributed. Preparation of up to 2,400 drug abstracts per year in Israel for use by the FDA and for publication in that agency's CLINICAL EXPERIENCE ABSTRACTS, foreign language issues, continues to be sponsored by the NLM. An evaluation report of the draft abstracts as received from Israel has been issued and recommended changes are being considered.

The Library continues to support the preparation in Israel of over 2,000 abstracts per year of reports of international research related to dental research and oral disease. These abstracts are published by the American Dental Association in ORAL RESEARCH ABSTRACTS.

Translations

The Library supports through contracts with the National Science Foundation the translation and printing in Israel of two serial publications on environmental health, HYGIENE AND SANITATION (USSR) and STAUB (German), for the PHS Bureau of Disease Prevention and Environmental Control. NLM also supports the translation of ten Polish and three Yugoslav health science journals (sixty-four issues per year) and distributes these selectively to health science libraries in the United States and abroad.

The Library instituted a survey of institutions receiving these journals to permit them to reaffirm, change, or discontinue acquisition of these journals. Support for translation and publication in Israel of selected monographs of interest to English-speaking health science personnel continues, as does translation of occasional articles on request from Public Health Service agencies.

A review trip to Israel was conducted by NLM staff and consultants to discuss projects in that country with contractors and scientific editors.

MEDICAL LIBRARY RESOURCE GRANT PROGRAM

The Medical Library Resource Grant Program, authorized by the Medical Library Assistance Act, provides for a program of "grants for improving and expanding the basic resources of medical libraries and related instrumentalities." Under terms of the Act, grants may be made to public or private nonprofit institutions for the purpose of expanding and improving their basic medical library resources. Medical Library Resource Grant funds may be used for the following: (1) acquisition of books, journals, films, tapes, photographs, or other informational material; (2) expenses of cataloging, binding, or other services necessary for processing library materials; (3) procurement of duplicating devices, facsimile equipment, film projectors, recording equipment, or other equipment to facilitate the use of library resources; (4) costs of introducing new technologies in medical librarianship; and (5) other individually described and justified items related to the operation of the library.

Approved Medical Library Resource Grants, administered by the Facilities and Resources Division are computed by a formula based on the annual operating expense of a library. The purpose of using the annual operating expenses as the base on which the grant is computed is twofold: (1) to make a significant, but relatively short-term grant to bring basic resources to a more useful level; and (2) to encourage increased support to the library by the parent institution on a continuing basis to compensate for a decreasing Federal contribution. During FY 1967 applications were received from 321 institutions located in forty-eight States.

CONSTRUCTION PROGRAM

The Medical Library Assistance Act authorized grants to aid in the construction of new medical library facilities and the renovation, expansion, or rehabilitation of existing libraries. The Facilities and Resources Division is responsible for the administration of the construction program. Architectural and engineering services (including construction management) are provided by NIH's Architectural and Engineering Branch of the Division of Research Facilities and Resources. The Act authorizes a total of 40 million dollars (10 million per year) during the four-year period beginning in FY 1967.

The Construction Program was organized at the beginning of the fiscal year and received its first applications in September, 1966. Twenty-eight applications for medical library construction were received. Seventeen of the twenty-eight were from medical schools, five were from hospitals, and others from schools of dentistry, pharmacy, and optometry. Nine of the twenty-eight applications were approved for a total of $7,231,628. Eleven applications are in the process of being reviewed.

The following factors are considered in the review of a construction grant application:

1. The necessity of the construction to meet demonstrated need for additional or improved medical library facilities (taking into consideration the number and types of users and the number of other information sources in the area).
2. The plans of the institution for effective utilization of new facilities to provide for additional or improved medical library services.
3. The extent to which the facilities would allow the applicant to provide medical library services of a magnitude to contribute to the accomplishment of national health objectives.

It has become apparent that there will be many more approvable applications than can be funded under the Medical Library Assistance Act. Therefore, the following sliding scale has been proposed for funding: 75% for the first 30,000 net square feet, 66-2/3% for the next 20,000 net square feet, and 50% for the next 10,000 net square feet. No support will be provided in excess of 60,000 net square feet without special justification and a showing of the unique value and need of such space.

REGIONAL MEDICAL LIBRARY PROGRAM

The need for a national network of regional medical libraries is expressed in the Medical Library Assistance Act which authorizes appropriations to "assist in the development of a national system of regional medical libraries each of which could have facilities of sufficient depth and scope to supplement the services of other medical libraries within the region served by it."

The objective of the Regional Medical Library Program is to bring the power and strength of the great medical libraries of the country closer to the user, whatever his geographic location. Grants will be utilized to improve, augment or strengthen regional services of those libraries already providing a base of "regional" services. Grants will not provide substitute support for on-going interlibrary services; rather, they will augment present capability to disseminate these services more extensively and more rapidly.

The Program is administered by the Facilities and Resources Division which, cognizant of the natural relationships between the health sciences information objectives of the PHS Regional Medical Programs (for heart, stroke, cancer, and related diseases) and the NLM Regional Medical Library Program, has established excellent liaison and cooperation between the two activities.

During FY 67 the Program collected current statistical data for each state in order to plan for the most feasible and realistic configuration of a regional network. Information was gathered about the number and percent of health professional personnel in each state, i.e., potential regional library users, distribution of health professional schools, hospitals affiliated with medical schools, amount and percent of Federally supported health related research and development grants for each state, and other pertinent data. Statistical data concerning the major medical libraries in each state were also gathered. Based on this statistical information, tentative plans were drawn up for possible networks.

The number of regional libraries to be supported by appropriations likely to be forthcoming during the existence of the Medical Library Assistance Act (the Act expires in 1970) is necessarily limited. It is estimated that approximately 10 regional medical library grants can be awarded during this period of time. Each will have to provide services for a relatively large portion of the Nation's health professional manpower, or, in certain cases, for a large geographic area of the country.

An Information and Policy Statement for regional medical libraries has been prepared setting forth the NLM philosophy of the Regional Medical Library Program, the concept of a "region," requirements for grant awards, and required reports and administrative details. A guide, "Reporting Procedures for Regional Medical Libraries," has been developed.

During FY 1967 discussions were held with regional medical library planning groups in nine of the ten proposed regions at the request of such groups. The first application for a regional grant was submitted by the Francis A. Countway Library of Medicine (of Harvard University and the Boston Medical Society) which was awarded a $104,872 grant to become the first Regional Medical Library. The Countway Library will serve the New England Region (Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island) through local medical libraries.

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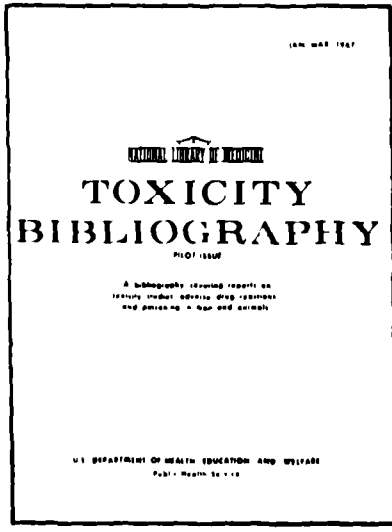

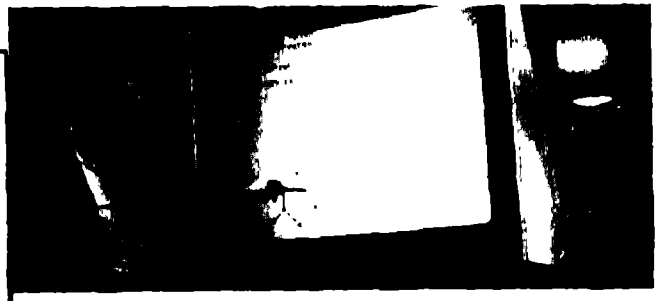

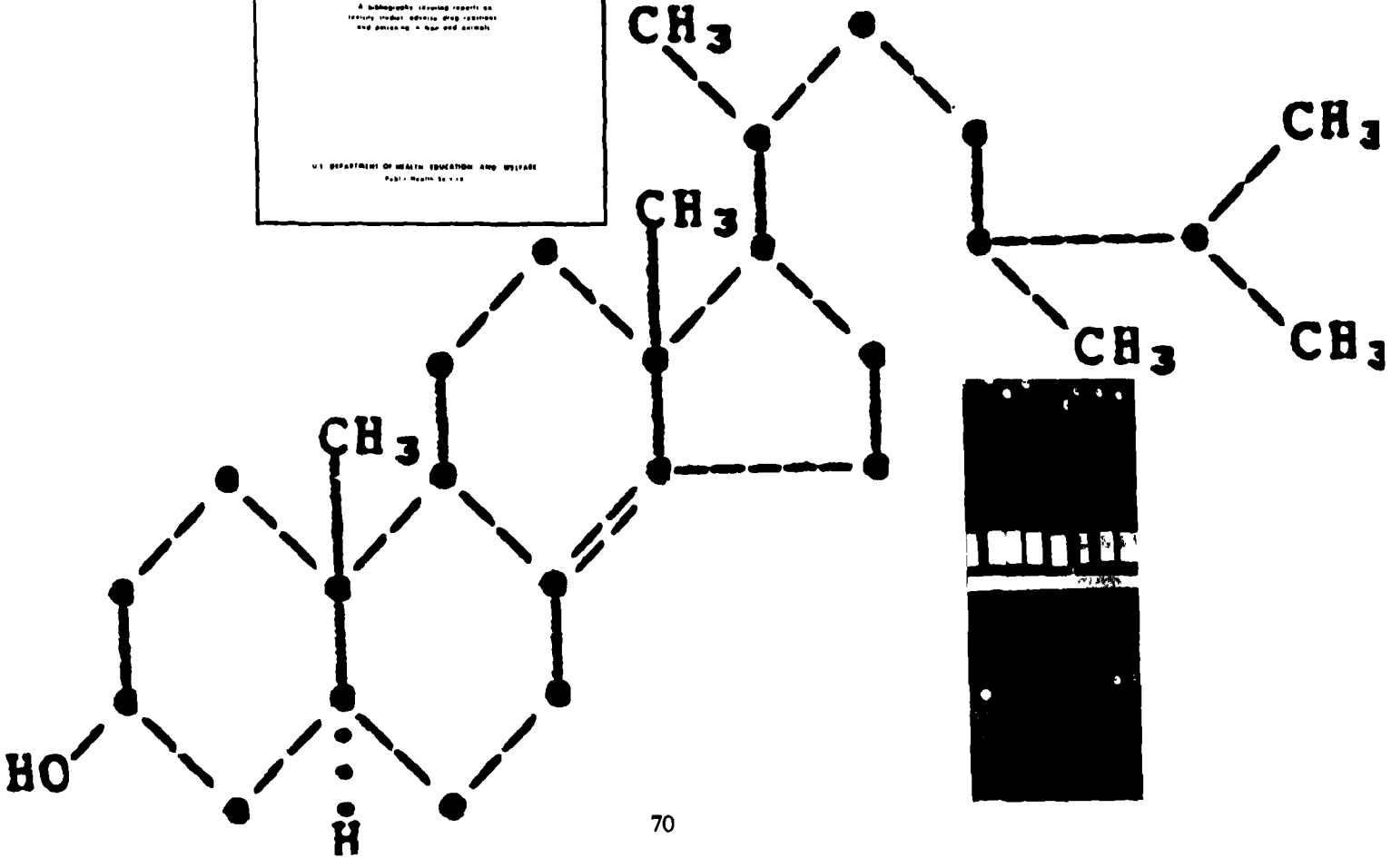

TOXICOLOGY INFORMATION PROGRAM

President Johnson, June 8, 1966, approved a report of his Science Advisory Committee on handling of toxicological information. The report called for the establishment of a computer-based file of toxicology information. On June 20, 1966, responsibility for establishment of such a file was assigned to the Department of Health, Education, and Welfare.

Secretary Gardner, on August 12, appointed a Departmental Toxicological Information Coordinating Committee. Dr. Philip R. Lee, Assistant Secretary for Health and Scientific Affairs, was designated Chairman. Other members: Dr. William H. Stewart, Surgeon General; Dr. James L. Goddard, Commissioner of the Food and Drug Administration; Dr. James A. Shannon, Director of the National Institutes of Health; Dr. Richard A. Prindle, Chief, Bureau of Disease Prevention and Environmental Control; and Dr. Martin M. Cummings, Director, National Library of Medicine. On the same day, the Secretary assigned primary responsibility for "a computer-based file of toxicological information" to the Public Health Service.

In January, 1967, Dr. Lee approved a proposal of the Surgeon General that called for the National Library of Medicine to develop a Toxicology Information Program. Dr. Charles N. Rice was appointed to head the new Program.

In January 1967, a preliminary five-year plan on the clearinghouse, referral, and evaluation functions of the National Library of Medicine, with specific regard for toxicology, was presented to the Coordinating Committee. This plan contemplated a series of evolutionary stages, beginning with referral services to sources to be identified by continual surveys, and progressing to supply references, documents, data, information or other services to be determined by continual studies of user needs.

POLICY

The program had a choice between using established resources, such as the files of Chemical Abstracts, Biological Abstracts, and the Food and Drug Administration, or creating a new system of information wholly within the Library. The decision was to use present resources as much as possible, to supplement or strengthen present resources where possible, to introduce new facilities, services, and products where necessary, and to seek harmonization and collaboration of all sources and users of toxicological information at all times.

Another choice was to confine the scope of the program to relatively few agents with the most damaging effects or to consider the whole range of biochemical interactions. The Coordinating Committee recommended that the program view its mission broadly.

OPERATIONS

In keeping with this policy, the program concluded an agreement on June 12, 1967, with the National Referral Center for Science and Technology at the Library of Congress for development of an inventory of information sources, with the prospect of publishing a directory of sources selected from the complete file.

Invitations for an expression of interest in a user study, published in Commerce Business Daily, were followed by invitations for proposals, but none of those responding were able, within the short time allotted, to respond effectively. We took the unusual step then of rejecting all bids and preparing a new request for proposals to be considered in the succeeding fiscal year. Preliminary indications from bidders lead us to hope for some original and thoughtful proposals for evaluating the needs of users as a basis for design of the program and development of products and services.

As an intermediate step in exploring needs of the users of toxicological information, we invited a group of distinguished toxicologists to the Library for a conference on the indexing and classification of the literature. A report on the spontaneous recommendations of this group, with its unexpected emphasis on the responsibility of primary sources, was drafted and approved by the group for transmittal to the Coordinating Committee.

ADMINISTRATION

In view of the many interests and activities of the Drug Literature Program of the Library held in common with the Toxicology Information Program, that unit was transferred to supervision by Dr. Rice, May 17, 1967,

Many agencies, professional organizations, and institutions have offered their cooperation to the Toxicology Information Program, and, to the extent that time permits, these cooperative proposals are taking shape. The Department of Defense, for example, will shortly give us direct access, on an experimental basis, to the information of the Army's Chemical Information Data System. A panel of the Committee on Scientific and Technical Communication known as SATCOM, in the National Academy of Sciences-National Academy of Engineering, has arranged several meetings with us to provide advice and obtain information for us. SATCOM has designated itself as our primary contact with the resources of the National Academy of Sciences-National Academy of Engineering.

The American Chemical Society has offered full cooperation in sharing its knowledge and procedures for photo-composition of chemical structures from machine-stored structural information. The policy of utilizing present resources has met with a good response.

DRUG LITERATURE PROGRAM

The Drug Literature Program, in its second full year of operation, improved the handling of drug literature by developing a Chemical Module for identifying about 40,000 chemicals, formerly listed only by categories, and by rendering the terminology and classification of drugs, chemicals, pharmacy and pharmacology more precise. Other Library programs received DLP support in indexing, searching, reference, acquisitions, and in special activities such as the MEDLARS II Task Force. A second pilot issue of the TOXICITY BIBLIOGRAPHY was published and distributed for evaluation. Many meetings were held with user groups to ensure that developing drug literature programs will meet their needs.

With transfer of the Drug Literature Program to the Toxicology Information Program, certain responsibilities and functions will be realigned. Subject specialists in one program will be easily available to the other and a better mix of subject specialization available to both. Duplication of functions will be avoided. The Drug Literature Program has been interested primarily in the literature, whereas the Toxicology Information Program is concerned with unpublished data as well.

EXPANDING THE COLLECTION

The DLP ordered 135 monographs, periodicals, card services, indexes, and other compendia. Gaps in the Library's holdings in drug literature were identified. A list of 69 titles of which one or more editions are missing was submitted to Technical Services Division for procurement.

EXPANDING MEDLARS COVERAGE

MEDLARS searches and similar bibliographies miss many relevant citations in pharmacology because the journals in which they were published are not indexed. A list of 126 substantive sources was compiled and reviewed by a panel of experts in the field. From the feedback, specific recommendations were developed for expanded coverage.

VOCABULARY IMPROVEMENT

Two advisory panels on terminology of autonomic drugs and toxicology assisted in the expansion of MEDICAL SUBJECT HEADINGS in these two fields and on improving classification of drugs and chemicals. In the interest of bringing NLM and FDA terminology into closer coincidence, Dr. James Long of the FDA Adverse Reactions Task Force participated. As the fiscal year ended, members of this panel turned to concentrated study of Environmental Health terminology.

THE AUXILIARY CHEMICAL MODULE

The Chemical Module will sharpen indexing and searching of literature on drugs and chemicals. Most of the 40,000 terms in the Common Data Base prepared from the NLM-FDA-NSF Source List, the NLM Index Section Dictionary File, MeSH unique and class terms, provisionals, and cross references, had undergone preliminary code registration in this first year of the contract with Chemical Abstracts Service. Many were recorded also on magnetic tapes and in the Desktop Analysis Tools (DATs), printed lists designed to relate synonyms, structures, and registered code numbers. Sets of DATs were received in February and June. The June DATs contained registry code numbers for approximately 18,000 compounds and approximately 96,000 chemical names. Programming for most special files was completed under contract with Informatics. Changes in MEDLARS programs were performed by Information Systems Division personnel, mainly to assist search. Several test tapes arrived from Chemical Abstracts Service (CAS) and, after trials on the Honeywell 800, their flaws were identified and corrected. Continued consultation with FDA and CAS has helped in understanding common objectives.

EXPANSION OF REFERENCE AND SEARCH SERVICES

Procedures were set up for interaction between DLP and the Reference Section, RSD, for handling inquiries related to drugs. Approximately 150 requests for drug references were reviewed by DLP; most of these were answered by DLP staff. Responses included photocopies of reference sources supplied with the cooperation of the Loan and Stack Section to the FDA Drug Efficacy Panel. DLP also provided direct bibliographic service to the Public Health Service Task Force on Prescription Drugs.

PUBLICATONS

A pilot issue of a CANCER CHEMOTHERAPY BIBLIOGRAPHY was produced for the Research Communications Branch of the National Cancer Institute. The first pilot issue of a TOXICITY BIBLIOGRAPHY covering the January-June 1966 MEDLARS file appeared early in the fiscal year. A selected group of pharmacists, pharmacologists, toxicologists, experts in forensic medicine, educators, etc., evaluated the bibliography. A second version, comprising the January through March 1967 MEDLARS file, incorporating suggestions of the reviewers, was distributed. A third edition is planned.

Ad Hoc Advisory Panel

Dr. George Hager, University of North Carolina
Dr. William Heller, American Society of Hospital Pharmacists
Mrs. Katherine Owen, Warner-Lambert Pharmaceutical Co.
Dr. Edward Pelikan, Boston University School of Medicine
Dr. Charles Rice, Eli Lilly and Co. and National Library of Medicine
Dr. Jean Weston, American Medical Association and National Pharmaceutical Council

Advisory Panel on Terminology of Autonomic Drugs

Dr. Edward Pelikan (Chairman), Boston University School of Medicine
Dr. Sydney Ellis, Woman's Medical College of Pennsylvania
Dr. John P. Long, The University of Iowa
Dr. Robert Volle, Tulane University School of Medicine

Advisory Panel on Toxicology Terminology

Dr. Earl Dearborn, Lederle Laboratories
Dr. Henry Smyth, Mellon Institute

PROFESSIONAL RELATIONSHIPS

The Ad Hoc Advisory Panel and the Advisory Panels on Terminology of Toxicology and of Autonomic Drugs assisted in the development of bibliographies, nonemclature and classification, planning of training programs, and expansion of journal coverage. The Autonomic Drug Panel recommended to the American Society for Pharmacology and Experimental Therapeutics that information on pharmacologic nomenclature work be passed on to society members through their publication, THE PHARMACOLOGIST, and that the Society encourage authors and editors to use preferred terminology. As a result of another recommendation, ASPET decided to establish a permanent Committee on Nomenclature, Terminology, and Symbolization, and to form subcommittees to work on terminology in areas other than autonomic agents and toxicology.

The Ad Hoc Advisory Panel, recognizing the need for training NLM and MEDLARS users in drug literature information, drafted outlines for suggested training programs varying from three days to a year.

Several orientation programs for Public Health Service pharmacy residents, representatives of NIH, and professional societies, were conducted.

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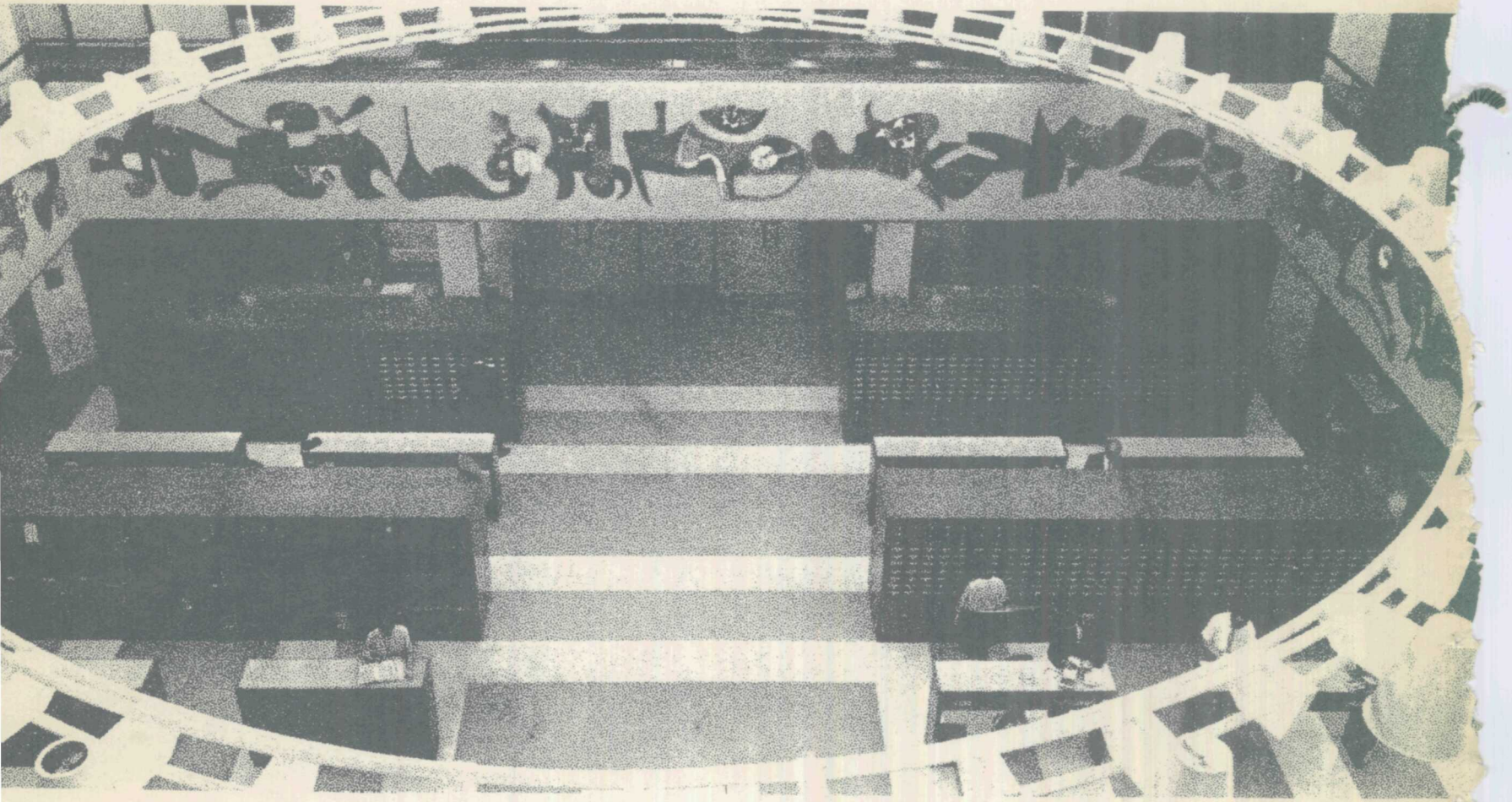

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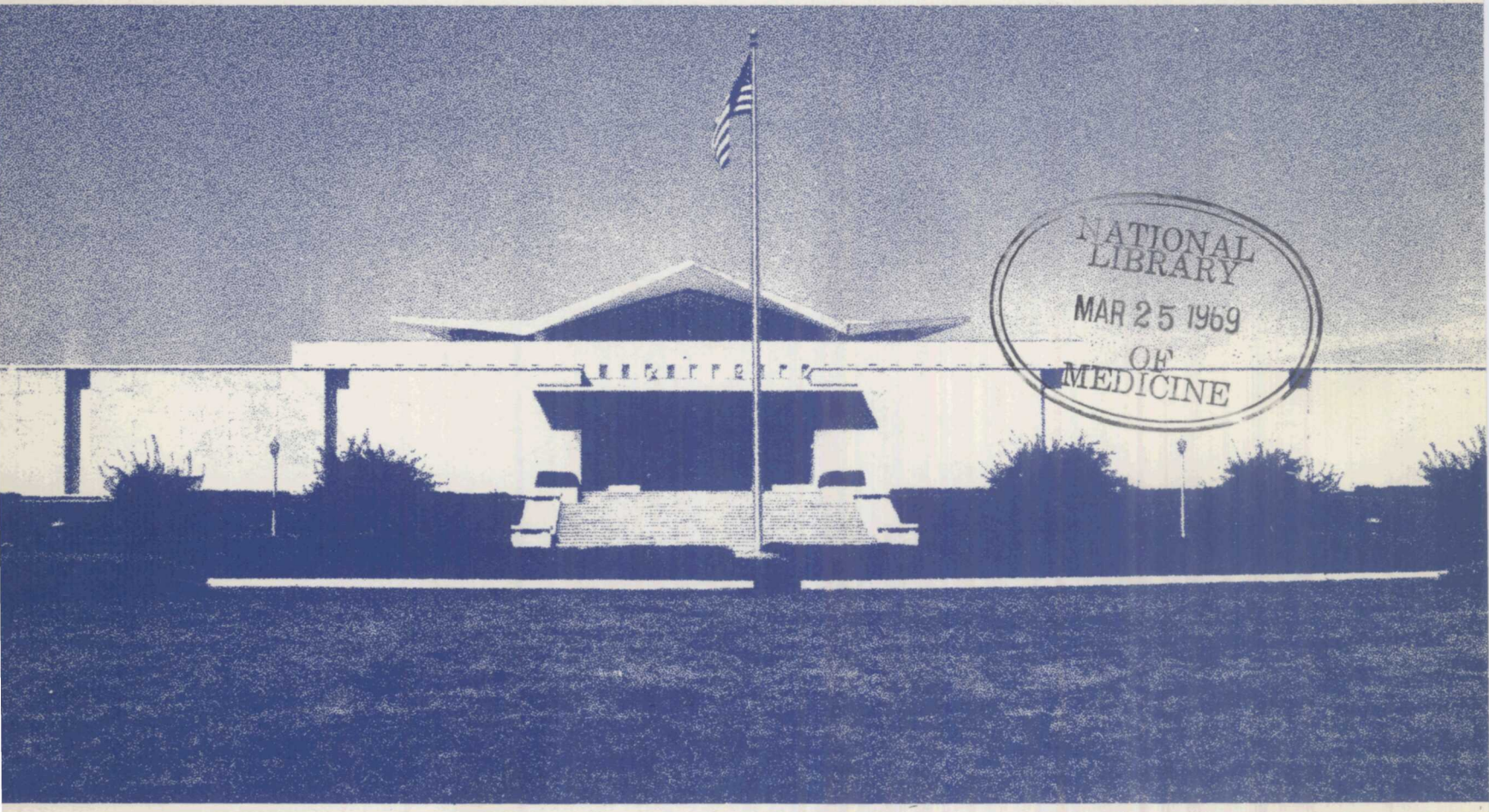

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Annual Report
for the
Fiscal Year 1968

National Library of Medicine

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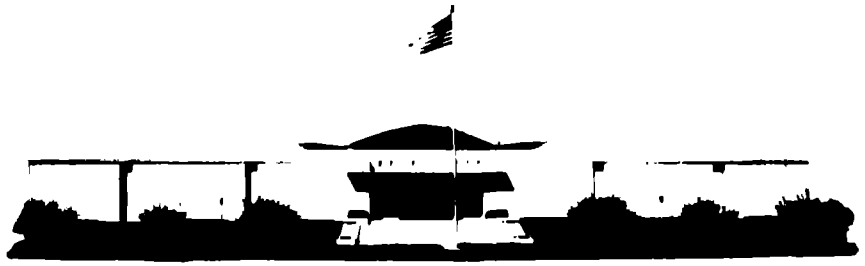

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*Term expired August 1967
**Term expired on retirement from Air Force November 1967

INTRODUCTION

"It is wise to try to know something of the pattern and to guess at some of the problems of tomorrow, but in the meantime we may not fold our hands and wait because we do not see clearly the way we are to go. We must do our best to meet the plain demands of today bearing in mind the warning of Ecclesiastes, 'He that observeth the wind shall not sow, and he that regardeth the clouds shall not reap.'"

J. S. Billings.

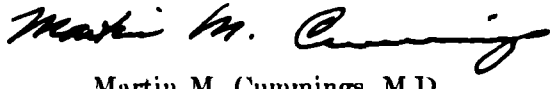
The problems of research libraries in 1968 are not dissimilar from those reviewed by Dr. John Shaw Billings in his presidential address to the American Library Association 62 years ago. Development of library resources, of cooperative delivery systems to make these resources available to users, stimulation of bibliographical efforts—these are still the fundamental problems.

It is the enormously increased complexity of the social environment in which the problems exist which distinguishes the NLM's attack on these classic problems—this, and the coming of age of new communication technologies which can be employed for their solution.

This report of NLM's activities in fiscal year 1968 constitutes a record of the programs the Library has conducted in the pursuit of its mission: to aid in the advance of the medical and related health sciences. It is also a record of stewardship of a tradition for innovation established by our predecessor in the early years of the American library movement.

Those new developments herein reported: the development of a national biomedical communications network, of a toxicological information system, of the application of audiovisual media to medical education, of a second generation MEDLARS, of a comprehensive Federal support program to strengthen and modernize medical libraries and information processing and delivery systems—these are the modern equivalents of earlier innovations: the *Index Medicus*, the *Index-Catalogue*, interlibrary lending, the substitution of photocopy for interlibrary loans, and the first MEDLARS.

The classic problems to which the Library addresses itself are far from solved. Instead, they have been magnified in their significance to the country through their identification with major national objectives of medical education and research. Nor can the Library, or any library, be complacent about its accomplishments. To remain vital, we must always strive to improve. As Dr. Billings once said, "If neither the librarian nor the readers are dissatisfied, the library is probably dying or dead."



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

OFFICE OF THE DIRECTOR

BOARD OF REGENTS

The Board of Regents held three meetings during the year, November 16–17, 1967; March 11–12, 1968; June 20–21, 1968. The session on March 12 was held at the National Medical Audiovisual Center, Atlanta, Ga.

The terms of three members expired August 1968: Barnes Woodhall, M.D., (Chairman), Vice Provost, Duke University Medical Center, Durham, N.C.; Herman H. Fussler, Ph. D., Director, University of Chicago Libraries, Chicago, Ill.; Morris Tager, M.D., Professor and Chairman, Department of Microbiology, Emory University, Atlanta, Ga. They were replaced by: William G. Anlyan, M.D., Dean, School of Medicine, Duke University, Durham, N.C.; George W. Teuscher, D.D.S., Dean, Dental School, Northwestern University, Chicago, Ill.; Max Michael, Jr., M.D., Executive Director, Jacksonville Hospitals Educational Program, Duvall Medical Center, Jacksonville, Fla.

In addition, R. L. Bohannon, Lt. General, M.D., The Surgeon General, Department of the Air Force and ex officio member of the Board, retired and was replaced by Kenneth E. Pletcher, Lt. General, M.C., The Surgeon General, Department of the Air Force.

Dr. Tager, Dr. Ebert and Mr. Augenstein, served as members of a subcommittee to study the role of the National Medical Audiovisual Center; Dr. Woodhall, Dr. Wolf, Dr. Tager, Dr. Kathryn Smith and Dr. Wagman served on the subcommittee for extramural programs and Mr. Zipf and Mr. Augenstein served as members of a subcommittee on research and development.

Significant actions of the Board at its three sessions included: (1) endorsement of general principles underlying draft regulations for library services; (2) endorsement of the research and development effort concerned with the development of a biomedical communications network; (3) adoption of a resolution commending the efforts of the U.S. National Libraries Task Force on Automation and Other Cooperative Services to develop compatible systems among the three National Libraries; (4) adoption of a resolution urging the release of funds for medical library construction grants; (5) adoption of resolution honoring Senator Lister Hill on his retirement; (6) approved as policy guidelines for free library services to qualified users; (7) adoption of a subcommittee report strengthening the educational mission of the National Medical Audiovisual Center.

HEW REORGANIZATION

After extended review, the Secretary, Department of Health, Education and Welfare, issued a directive on April 1, 1968, establishing three principal administrations for the management of HEW health programs: (1) The Health Services and Mental Health Administration; (2) The Consumer Protection and Environmental Health Administration; and (3) The National Institutes of Health.

As a function of this organization, the National Library of Medicine, together with the Bureau for Health Manpower, was transferred administratively to the National Institutes of Health.

Under this reorganization, the Board of Regents advises the Assistant Secretary for Health and Scientific Affairs and the Director, National Library of Medicine, reports to the Director of the National Institutes of Health.

The transition of the Library to the National Institutes of Health was accomplished smoothly and effective working relationships at various levels of administration were promptly worked out during the course of the year.

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NATIONAL LIBRARY OF MEDICINE REORGANIZATION

On January 9, 1968, the Department established a new organization for the National Library of Medicine.

The reorganization identified five major programs in biomedical communications within the Library's mission: (1) Library operations, incorporating the Technical Services, Reference Services, Bibliographic Services, and History of Medicine Divisions, under Dr. Joseph Leiter, Associate Director for Library Operations; (2) Specialized Information Services, comprising the Toxicology Information Program and the Drug Literature Program, under Dr. Charles N. Rice, Associate Director for Specialized Information Services; (3) Audiovisual programs, incorporating the activities of the National Medical Audiovisual Center, under Dr. James Lieberman, Associate Director for Audiovisual-Telecommunications and Director of the National Medical Audiovisual Center; (4) Research and Development, under Dr. Ruth M. Davis, Associate Director for Research and Development; and (5) Extramural programs, under Mr. David F. Kefauver, Associate Director for Extramural Programs.

Another significant change in the reorganization was the establishment of the Office of Computer and Engineering Services (accomplished through transfer and redesignation of the Information Services Division, formerly in the Intramural Programs). Mr. Alfred Asch, Chief of OCES reports to the Director, NLM and renders support service to all programs of the Library.

An Office of Public Information Publications Management was established which also reports to the Director. Now under Mr. Huly Bray, this function was formerly handled under an Assistant to the Director.

To meet an increased need for integration of the expanding scope of NLM programs and user communities and to provide recommendations to the Director on NLM program plans, a program planning and evaluation group was established with the Deputy Director, Mr. Scott Adams, as Chairman. Associate directors, and other executive staff are members.

RELATIONSHIPS TO EXTERNAL GROUPS

The Director served as departmental representative to the Committee on Scientific and Technical Information (COSATI) of the Federal Council of Science and Technology as well as a member of its steering committee and a member of its Task Group on National Systems for Scientific and Technical Information.

Dr. Ruth M. Davis, Associate Director for Research and Development, served as Chairman of COSATI's Panel 2 on Information Sciences Technology.

Miss Mary E. Corning, Special Assistant to the Director for International Programs served as a member of COSATI's Panel 4 on International Information Activities and the Deputy Director served as alternate representative to COSATI.

Mr. James G. Hill, Assistant Executive Officer, served as a member of COSATI's Panel 5 on Management of Informational Activities.

Mr. Davis McCarn, Deputy Associate Director for Research and Development, served as a member of the Task Group on Technology Utilization.

The Scientific and Technical Committee of the National Research Council (SATCOM) as a function of its review of Federal agency programs for scientific and technical information, held a meeting at the National Library of Medicine on December 15, 1967. Senior Library personnel attended other sessions of this committee throughout the year.

The library was also represented at meetings of the Federal Library Committee during the year.

The Directors of the three National Libraries, the Library of Congress, the National Agricultural Library and the National Library of Medicine, met several times during the year to provide policy and guidance to the U.S. National Libraries Task Force on Automation and other Cooperative Services.

The Director and Deputy Director attended sessions of the Association of Research Libraries of which the National Library of Medicine is a member, and the Director served during the year as a member of the Association's Board of Directors.

The Deputy Director served as President of the Medical Library Association during the year.

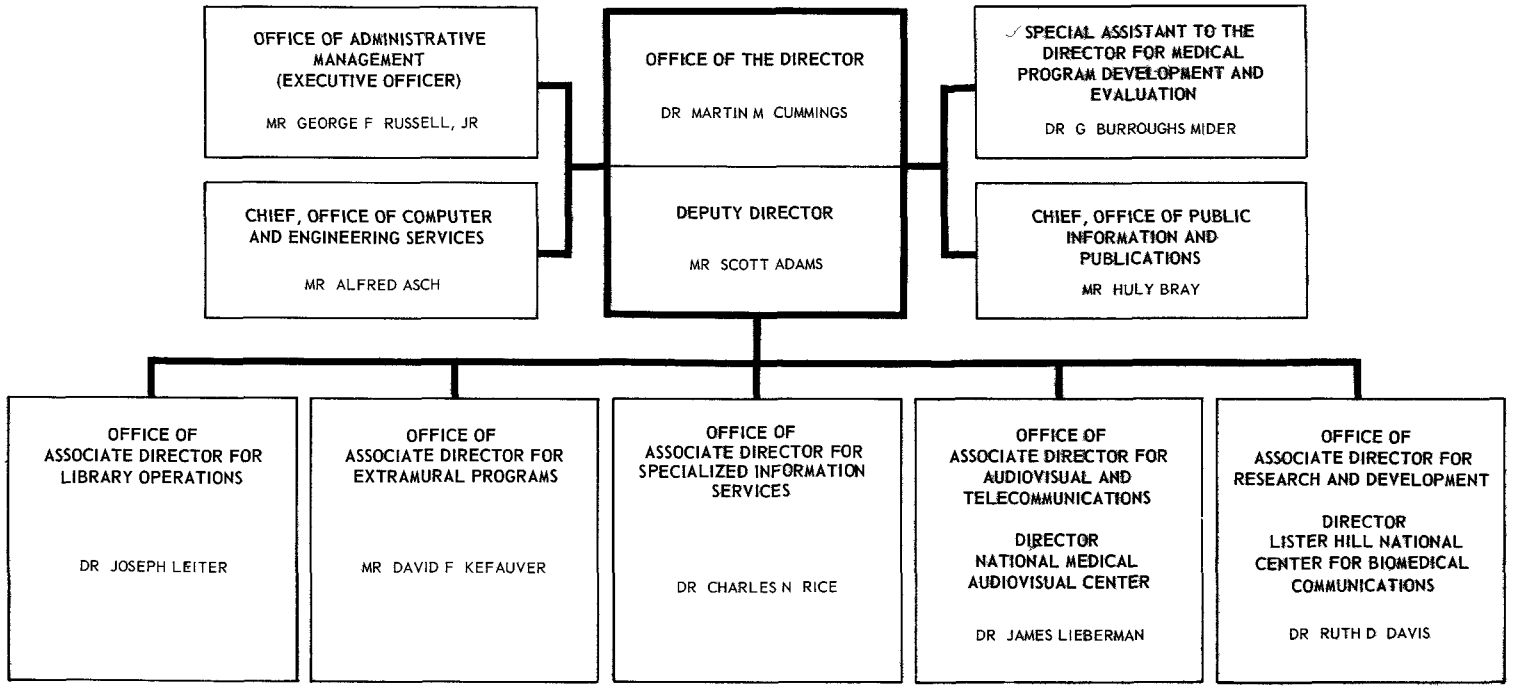
STAFF HONORS AND DISTINCTIONS

Bucknell University awarded the honorary degree of Doctor of Science to the Director at its commencement in June, 1968.

The Director received the Departmental Distinguished Service Award on April 11, 1968.

Quality increases were awarded to 19 employees, while 24 received cash awards for work performance on special acts or services. Ten suggestions were submitted under the Beneficial Suggestion Program, of which four were adopted and four are pending.

ORGANIZATION CHART FOR THE NATIONAL LIBRARY OF MEDICINE



PROGRAM OFFICIALS

OFFICE OF THE DIRECTOR

Director	MARTIN M. CUMMINGS, M.D.
Deputy Director	SCOTT ADAMS
Special Assistant to the Director Medical Program Development and Evaluation	G. BURROUGHS MIDER, M.D.
Special Assistant to the Director International Programs	MARY E. CORNING
Special Assistant to the Director Production Management	THOMAS JOYCE

OFFICE OF ADMINISTRATIVE MANAGEMENT

Executive Officer	GEORGE F. RUSSELL, Jr.
Assistant Executive Officer	JAMES G. HILL
Financial Management Officer	MICHAEL L. SPRINGER
Personnel Officer	JAMES KERKHOFF
Property and Supply Officer	JOSEPH MCGROARTY
Contract Officer	KENNETH STYERS

OFFICE OF PUBLIC INFORMATION AND PUBLICATIONS MANAGEMENT

Chief	HULY E. BRAY
Deputy Chief	(VACANT)
Special Projects	MALCOLM FERGUSON, PH. D.
Scientific Editorial Section	RAQUEL S. HALEGUA, D.D.S.
Graphics Director	DANIEL L. CARANGI
Publications	ROGER GILKESON
News Editor	MARLYN LEBEDZINSKI
Tour Coordinator	HILDA FRIED

OFFICE OF COMPUTER AND ENGINEERING SERVICES

Chief	Alfred Asch
Deputy Chief	Allan Doris
Project Management Staff (Acting)	Barbara Sternick
Processing Support Section	William Smith
Systems Applications Sections	John Walden
Systems Development Section	Barbara Sternick

RESEARCH AND DEVELOPMENT

Associate Director	Ruth M. Davis, Ph. D.
Deputy Associate Director	Davis McCarn
Special Assistant to the Associate Director	Ben LaRue Parker
Operations Research and Systems Analysis Staff	Richard See
Information Sciences and Computer Sciences Staff	Ralph A. Simmons
Communications and Electronic Engineering Staff	M. Zane Thornton

LIBRARY OPERATIONS

Associate Director	Joseph Leiter, Ph. D.
Deputy Associate Director	Samuel T. Waters
Special Assistant to the Associate Director	F. W. Lancaster
Administrative Officer	Norman H. Smith
Technical Services Division Chief	Stanley Smith
Deputy Chief	Salvatore Costabile
Selection and Acquisition Section (Acting)	Frank Libersky
Cataloging Section	Emilie Wiggins
Coordinator for Veterinary Affairs	Fritz P. Gluckstein, D.V.M.
Bibliographic Services Division Chief	Clifford Bachrach, M.D.
Deputy Chief	William Caldwell
Index Section	Stanley Jablonski
Search Section	Charlotte Kenton
Medical Subject Headings Section	Norman P. Shumway, M.D.
MEDLARS Management Section	Lillian H. Washington

Reference Services Division Chief	SAMUEL T. WATERS
Deputy Chief	EDWARD A. MILLER
Reference Section (Acting)	EDITH BLAIR
Loan and Stack Section	ALBERT BERKOWITZ
Photoduplication Section	WILLIS A. LAMBERT
Preservation Section	WALTER D. CAMPBELL
History of Medicine Division Chief	JOHN B. BLAKE, PH. D.
Deputy Chief	PETER OLCH, M.D.

EXTRAMURAL PROGRAMS

Associate Director	DAVID F. KEFAUVER
Special Assistant to the Associate Director	ANN A. KAUFMAN, PH. D.
Grants and Contracts Management Officer	LAWRENCE K. COFFIN
Facilities and Resources Division Chief (Acting)	ARTHUR J. BROERING
Construction Program Officer	ARTHUR J. BROERING
Medical Library Resource Grants Assistant	MARILYN MILLER
Regional Medical Library Officer	LEON J. NIEMIEC, PH. D.
Publications and Translations Division	JEANNE L. BRAND, PH. D.
Scientific Publications Officer	JOSEPH B. FOLEY
International Communications Program Officer	(VACANT)
Research and Training Division Chief (Acting)	DAVID F. KEFAUVER
Training Grants Officer	HERBERT H. FOCKLER
Research Grants Officer	PETER CLEPPER

SPECIALIZED INFORMATION SERVICES

Associate Director	CHARLES N. RICE, PH. D.
Administrative Officer	STANLEY J. PHILLIPS
File Organization and Statistics	ALFRED WEISSBERG
Products Services Planning and Development	DANIEL A. MILLS
Drug Literature Program	E. WINIFRED SEWELL

NATIONAL MEDICAL AUDIOVISUAL CENTER

Associate Director for Audiovisual and Telecommunications and Director NMAC (Also Assistant Surgeon General)	JAMES LIEBERMAN, D.V.M.
Deputy Associate Director and Deputy Director	EDWARD MCCLELLAN
Assistant Director for Operations	JEROME K. BARNETT
Administrative Officer	DONDELL C. COTTER
Associate in Biomedical Communications	HENRY D. ABRAHAM, M.D.
Special Projects Officer	J. PATRICK DENMAN
Public Information Officer	KATHERINE C. SKOGSTAD
Acquisition, Distribution and Reference Branch Chief (Acting)	ROBERT E. SUMPTER
Educational Systems and Development Branch Chief (Acting)	NORMAN L. COLE, ED.D.
Production Branch Chief (Acting)	JACK C. KIRKLAND

OFFICE OF ADMINISTRATIVE MANAGEMENT

Activity in the Office of Administrative Management (OAM) during fiscal year 1968 reflected the growth in size and complexity of the Library's programs during the year.

A formal program of performance briefings and reviews presented to the Director by the Associate Directors, Office and selected Division Chiefs was implemented in fiscal year 1968. Reviews are normally held on a quarterly basis to enable the NLM executive staff to present and review program performance and to develop goals for the following periods. Institution of the formal briefing system has assisted in integrating the coordinating program activities as well as assuring continued awareness of all major program efforts within the NLM executive staff.

Increased attention to methods and procedures to meet expanding workloads resulted in the assignment of a full-time staff member to this function. The Library inaugurated in November a new administrative management manual to replace the old administrative circular system. Review of records management and forms management will be fully implemented in 1969.

In addition to program growth, the circumstances accompanying economy drives in the Congress and the Executive Branch and reorganization in DHEW contributed to the tempo of activity in OAM. The general constraints on Federal expenditures during 1968 imposed additional responsibilities. The OAM implemented the DHEW Cost Reduction Plan for the NLM, and developed and operated control systems on personnel ceilings and on grant and contract obligations and expenditures.

Preparations were made for the reorganization of budget and accounting activities to conform to National Institutes of Health systems by the beginning of fiscal year 1969. For financial statistics see Chart I.

Preparations and negotiations for the transfer of accounting and financial management functions at the National Medical Audiovisual Center were undertaken in fiscal year 1968. Full assimilation is expected by the end of 1969.

Additional personnel management authority was delegated to the National Library of Medicine, and an Office of Personnel was formally established. An additional personnel management specialist and personnel clerk were recruited to handle the increased workload created by the new programs instituted in the Library and the expansion of ongoing programs. For personnel authorizations see Chart II.

A record number of personnel tranactions was effected during the fiscal year including 226 recruitments, 188 promotions and 161 separations (Chart III).

On February 1, 1968, the training function was transferred from the Office of the Deputy Director to the Personnel Office with responsibility for insuring the development and implementation of a Library-wide training plan responsive to the needs of the Library.

One hundred and fifty employees participated in various in-service training programs in the Library during fiscal year 1968 while 95 studied at nongovernmental facilities.

Seventy students were provided an opportunity for meaningful employment during the summer months. Of these, 59 were employed at Bethesda and 11 at Atlanta (NMAC). Thirty-one of the students were appointed under the President's Youth Opportunity Program. Training programs were established for all summer student employees.

The Library continued its Associate Program for postgraduate training in biomedical librarianship. Two candidates—Miss Rose M. Woodsmall and Mr. James Swanton—successfully completed a program of supervised study and work assignments in the Library's operating divisions, and attended lectures, seminars, and workshops.

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FINANCIAL STATISTICS: OBLIGATIONS

AMOUNTS AVAILABLE FOR OBLIGATION, 1968
(in thousands of dollars)

Regular 1968 Appropriation, NLM	19,912
Transferred from National Communicable Disease Center	1,762
Reimbursements from other Agencies	578
	182
Recoveries from prior year obligations	182
NLM Allowance from Special Foreign Currency Program	488
Brought Forward from 1967	10,567
Carried Forward to 1969	4,338
TOTAL AVAILABLE	**29,151**

AMOUNTS OBLIGATED BY PROGRAM IN 1968
(in thousands of dollars)

GRANTS	
Construction	10,000
Training	922
Special Scientific Project	54
Research	1,261
Library Resource	3,537
Regional Medical Library	680
Publication Support	372
Subtotal, grants	16,826
DIRECT OPERATIONS	
Library Operations	5,777
Toxicology Information	586
National Medical Audiovisual Center	2,255
Research and Support Contracts	413
Review and Approval of Grants and Contracts	510
Program Direction	1,477
Subtotal, direct operations	11,018
SPECIAL FOREIGN CURRENCY PROGRAMS	
India	3
Israel	422
Poland	22
Subtotal, foreign currency	447
TOTAL OBLIGATED	**28,291**

CHART I

In order to provide additional office and film storage space for NLM programs, a contract for renovation of portions of C-level was awarded during 1968. An interior decorator from the General Services Administration completed an interior design for the new office space on C-level utilizing the "open space" concept commonly employed in banks, and in some of the newer government buildings. The "open space" concept includes the use of carpeting, colorful furniture and room dividers to provide a measure of privacy for employees, while at the same time maintaining the flexibility inherent in an area without partitions.

Perhaps the most telling evidence of increased activity in OAM arising from expansion of NLM activities is the fact that contracting more than doubled over the previous year. Thirty-seven contract actions involving obligations totalling $3,048,708 were handled during the year.

PERSONNEL

PERSONNEL ON DUTY	FY 66	FY 67	FY 68
OFFICE OF THE DIRECTOR	51*	11	10
PUBLIC INFORMATION AND PUBLICATIONS	-	9	11
OFFICE OF ADMINISTRATIVE MANAGEMENT	-	29	35
OFFICE OF COMPUTER AND ENGINEERING SERVICES	-	-	50
EXTRAMURAL PROGRAMS	21	33	35
RESEARCH AND DEVELOPMENT	-	1	11
SPECIALIZED INFORMATION SERVICES	-	10	17
NATIONAL MEDICAL AUDIOVISUAL CENTER	-	-	127
LIBRARY OPERATIONS	237	240	200
Immediate Office of Associate Director	(4)	(9)	(11)
Bibliographic Services Division	(32)	(43)	(46)
Technical Services Division	(57)	(56)	(55)
Reference Services Division	(68)	(69)	(70)
History of Medicine Division	(18)	(19)	(18)
TOTALS	320	333	496
PERSONNEL AUTHORIZED	352	397	536

*Includes PIO and OAM

CHART II

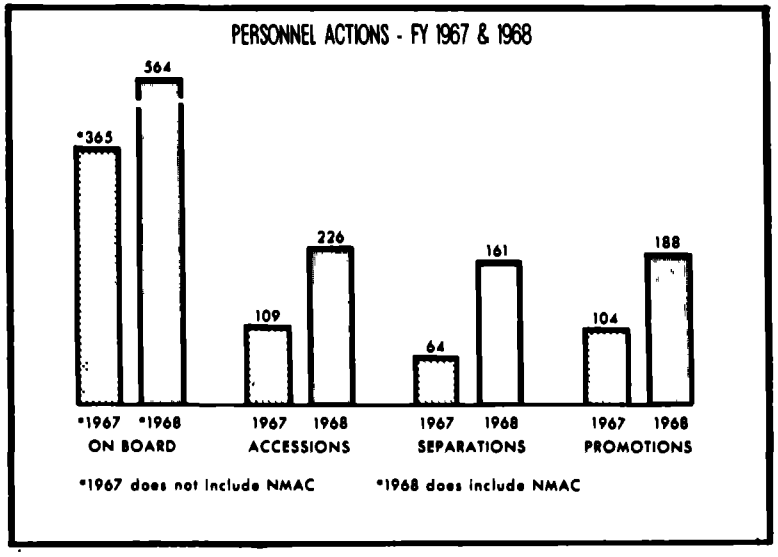

CHART III

OFFICE OF INFORMATION AND PUBLICATIONS MANAGEMENT

During fiscal year 1968, the Office of Public Information and Publications Management continued to execute a variety of responsibilities covering liaison with the medical and public press, monitoring and conducting guided tours of visitors from all over the world, preparing and routing exhibits throughout the United States, handling Congressional correspondence, preparing and distributing the *NLM News* and *On-Line* publications, screening manuscripts for clearance, projecting special events, evaluating audiovisual requirements, and supervising the printing of the NLM publications.

PUBLICATIONS

Starting in January 1968 the first quarterly *Toxicity Bibliography* produced by the Bibliographic Services Division and the Drug Literature Program was added to the Library's list of computer-produced publications and placed on sale by the Government Printing Office. Also in January, the NLM began publication of the *Monthly Bibliography of Medical Reviews* as a quick reference desk tool separate and apart from *Index Medicus*. In July 1967 a new 36 page catalog, *Prints Relating to Dentistry*, covering those produced from the 15th to 20th centuries, was made available for sale at the Government Printing Office.

LITERATURE SEARCHES

The Library's program for publishing selected Literature Searches became even more popular during 1968. These are bibliographies originally produced as demand searches in response to individual requests on topics assumed to be of broader interest. They are announced in journals and published for widespread distribution to interested health professionals. During fiscal year 1968, 3,271 persons requested 18,403 copies of these published literature searches.

GUIDED TOURS

More than 2,000 visitors were conducted on tours of the NLM. This total includes foreign visitors from Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Colombia, Czechoslovakia, Denmark, England, France, Ghana, India, Indonesia, Ireland, Italy, Israel, Japan, Korea, Mexico, Nigeria, New Zealand, Norway, Pakistan, Panama, Rumania, the U.S.S.R., South Africa, South Vietnam, Sweden, Thailand, Venezuela, West Germany, and Yugoslavia.

EXHIBITS

Exhibits depicting the Library's programs, services, and products were displayed at 41 locations throughout the United States. Featured in the NLM lobby were the following exhibits: Prints Relating to Dentistry; Space Medicine; Drugs and History; Law and Medicine.

CONGRESSIONAL CORRESPONDENCE

This office acted as the monitoring point for mail and phone queries from members of Congress. In addition, the office processed an average of 50 mail and phone inquiries per day throughout the year.

AUDIOVISUAL

Staff assistance was provided for implementation of the merger of the National Medical Audiovisual Center with the National Library of Medicine. Assistance was also provided for CBS TV camera crew for NLM portion of Walter Cronkite's 21st Century Program, *The Computer Revolution.*

OFFICE OF COMPUTER AND ENGINEERING SERVICES

Fiscal year 1968 was one of considerable change for this organization and its mission. On January 2, 1968, the Informations Systems Division was renamed the Office of Computer and Engineering Services and in accordance with the NLM reorganization became an Office under the Director of the National Library of Medicine. With the award of the MEDLARS (Medical Literature Analysis and Retrieval System) II contract, which will result in the improvement and expansion of the existing MEDLARS I, the mission of this office was modified to include the direction, management, and implementation of the new system. The new organization is shown in Chart IV.

MEDLARS I

The Library pioneered in the first large scale library-based operation of advanced electronic information retrieval techniques with the development and implementation of the computer-based MEDLARS which became operational in 1964. Articles from more than 2,000 biomedical journals in some 40 languages are regularly indexed at the Library, and the citations transferred to magnetic tape for processing and storage in the computer's memory bank.

This system in tandem with the computer driven "page-per-minute" phototypesetter (Photon 900) developed for MEDLARS has been used to produce the monthly *Index Medicus* and its annual cumulation, the biweekly *Current Catalog*, and a series of recurring bibliographies in specialized subject areas for publication by cooperating professional organizations.

It has also been successfully used since 1964 to provide for individualized "demand search" services. As described later in this report, decentralization of these search services through a network of cooperating search centers has resulted in a prototype national network.

However, workloads and maintenance requirements have long exceeded the design characteristics of MEDLARS I. Accordingly, the Library determined in 1966 to develop a replacement system, MEDLARS II, which could take advantage of the advances in computer technology to provide an increased capability to the Library's programs.

The fiscal year 1968 saw a concentrated effort to implement MEDLARS II. This was a cooperative effort shared by Library Operations, Research and Development, and OCES, culminating in the award of a contract to the Computer Sciences Corporation on June 11, 1968.

Library Operations was responsible for the determination of requirements leading to the Request for Proposal, which was sent to qualified firms on August 4, 1967. Research and Development was responsible for organizing and directing a formal evaluation of the bids received, and, on the award of the contract, the Chief, OCES, was named Project Director.

MEDLARS II will be implemented in three phases. Level I, to be operational by the end of September 1969, will replace the capabilities of MEDLARS I. Level II development is scheduled to begin in mid 1969. Level II will provide for improved support to Library functions, such as furnishing a capability to remotely display and update MeSH information; on-line browsing of selected parts of the computer data base; computer-aided cataloging, indexing, and search formulation functions. Level III will provide for continued improvements for Library operations with an integration of the system into the biomedical communications network. It is anticipated that the total MEDLARS II will be operational by the end of 1971.

MEDLARS I OPERATIONS

After having selected a contractor for the development of MEDLARS II, the Library determined the final modifications to be made to MEDLARS I. This action was taken to provide for improved capability and to facilitate an orderly transition from the existing system to the new one. The improvements will

involve the upgrading of computer hardware components and software.

A program was designed to be used to (1) renumber the Compressed Citation File in order to eliminate existing gaps, thereby permitting additional number assignment, and (2) to identify uniquely each CCF record for better control over the data base. Implementation will take place early in fiscal year 1969.

The modification of the mainheading and subheading input error correction procedure also provided a saving to the Library. A saving of manhours and the elimination of duplicate and/or unnecessary look-up of MeSH (Medical Subject Headings) terms resulted from (1) the improvement of the format of the error listing, and (2) the change in the error processing flow.

MEDLARS CITATION DATA BASE

The Compressed Citation File (CCF) contained over 800,000 citations on magnetic tape as of June 30, 1968. The projected input to this data base is 220,000 citations for fiscal year 1969. The growth of the CCF is shown in Chart V.

As a result of the increased demand placed on the computer system during this fiscal year, it became necessary to reduce the number of months of the data base to be searched. Except for special requests, two years (1966 to present) now constitutes the operating data base for demand search requests.

Toward the end of the year, steps were taken to prevent the creation of a backlog in demand processing by selecting search requests forwarded to the Library and sending them to remote search centers for processing.

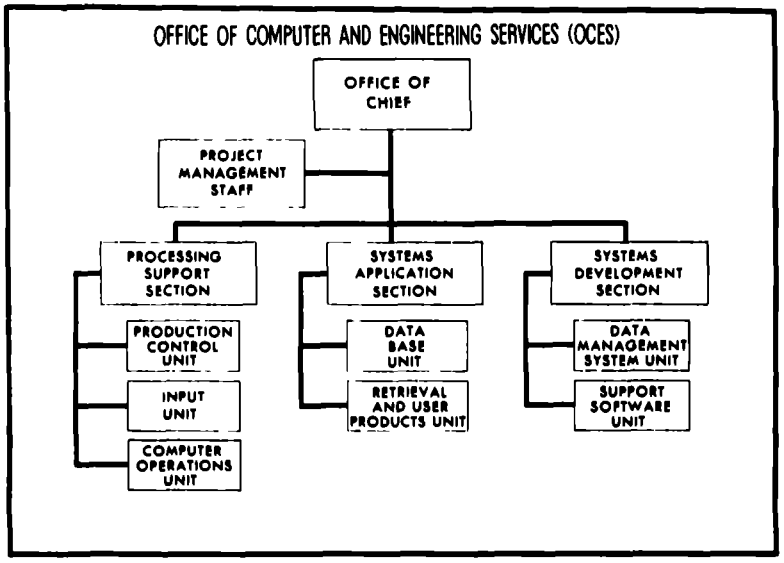

CHART IV

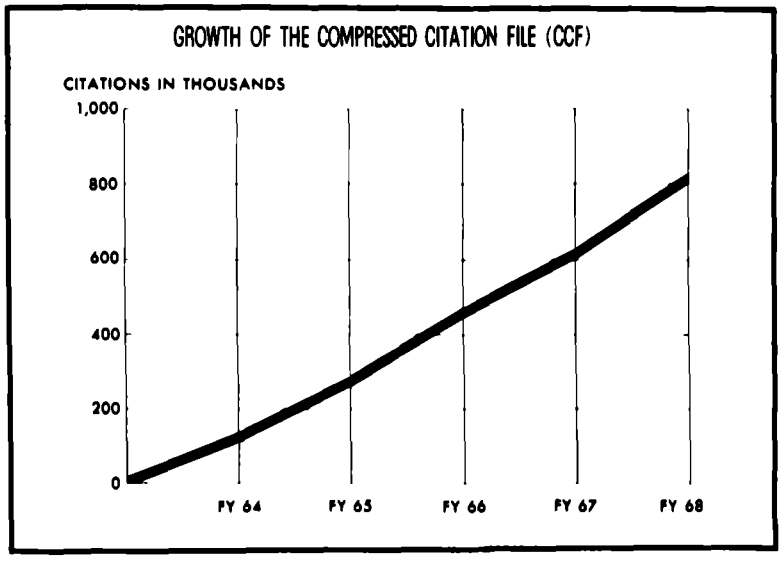

CHART V

RECURRING BIBLIOGRAPHIES

During the past fiscal year, OCES processed nine recurring bibliographies, an increase of two over fiscal year 1967. Requirements will result in an increase to 16 in fiscal year 1969.

INTERIM CATALOG MODULE

The catalog file now contains over 54,000 citations covering the period of January, 1965 through June, 1968. An addition of 20,000 catalog entries during fiscal year 1969 is anticipated.

The systems and programming modifications incident to the cataloging and publishing of the Technical Report Section, an integral part of the *Current Catalog*, were considered operational during the past year. Modifications included: (1) the elimination of alphanumeric pagination in the *Current Catalog*; (2) provision of continuous numeric pagination of *Current Catalog* sections; (3) and the creation of a subject and name section of the newly added Technical Report Section of this biweekly publication.

The Interim Catalog Module was also modified during the year to allow for the inclusion of a second call number and multiple library symbols in the *Current Catalog*, as well as the preparation of separate card sets for each participating library (with each set identified).

COMPUTER UTILIZATION

Computer operations continued on a four-shift basis. The personnel constraints during the year required the manning of 183 shifts by programmers within OCES. During the latter part of fiscal year 1968, peripheral equipment failures were experienced, in particular the paper tape reader, and printer. Investigation was underway for replacement of these devices with later models provided by the manufacturer.

GRACE

During the reporting period, operational difficulties developed with the prototype graphic arts composing equipment (GRACE). Heavy utilization of this system necessitated preparation for an overhaul, and the development of a backup capability. Overhaul should be completed during the second quarter fiscal year 1969.

Programming and testing for a commercial backup capability for GRACE was completed. The contractor has been provided with a set of Photon 901 (ZIP) matrix plates containing the Library's character set which can be used, should GRACE become inoperable.

Over 80,000 pages were prepared on the GRACE equipment, an increase of 40 percent over last year.

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OFFICE OF ASSOCIATE DIRECTOR FOR RESEARCH AND DEVELOPMENT

Fiscal year 1968 was a year of intensive activity and accomplishment aimed at creating a viable research and development program to support the National Library of Medicine in its information and communications responsibilities. The R. & D. program achieved major accomplishments in the following areas: acquiring a staff of competent R. & D. specialists, experimenting with information handling technology, applying technology to current NLM problems, developing plans for a biomedical communications network, and obtaining the contract services of expert university and industrial talent to assist in solving biomedical communications problems.

At year's end, NLM had a vigorous R. & D. program and a competent R. & D. staff, both of which constitute powerful forces for the improvement of biomedical communications within the Nation's health structure.

STAFFING

The staff of the Associate Director for Research and Development, was accorded "office" status in January 1968, and given responsibility to: (1) conduct research and development in biomedical communications, with emphasis on information sciences, and to improve the means of communication of information in the health sciences; (2) apply technology to improvement of library operations, of biomedical information systems, and of communications practices of individual professionals; (3) conduct research and development in document and information handling networks, in graphic image storage, retrieval, and transmission, in query languages, and man and machine communications; (4) apply operations research techniques to NLM programs and operations; and (5) evaluate ongoing information systems and programs.

By the end of the fiscal year, the office had grown to a strength of 10 professional and clerical personnel. Two additional senior professional personnel had been recruited and were expected to enter on duty shortly after the beginning of the fiscal year 1969. The professional members of the office possessed a wealth of knowledge of information technology. All were experienced in the techniques of systems design, development and management, and all were experienced in the use of contractors to augment Government resources.

EXPERIMENTING WITH TECHNOLOGY

The R. & D. staff moved quickly to establish a Remote Information Systems Center (RISC) to connect the Library with several remote data banks of information, and to create an environment in which to conduct a variety of experiments aimed at exploring the application of computer time-sharing technology to the problems of building a biomedical communications network. In terms of its actual configuration, RISC is a specially selected set of teletypewriters, data sets, and interrogation consoles which collectively permit a NLM user to access more than one million bibliographic citations in computer-based systems around the country. Following are the RISC links effected during the year:

Time-Sharing System (TSS)

Through either a Model 33 or Model 37 teletypewriter and data set, NLM is linked with an AN/FSQ-32(Q-32) computer operated by the Systems Development Corporation and located in Santa Monica, Calif. The computer time sharing system available through this link makes it possible to accomplish computer programming on-line; to develop and administer computer-aided instruction; and to develop, up-date, and manipulate data files for a variety of management applications.

Centralized Information Reference and Control On-Line Experiment (COLEX)

Through RISC's connection to SDC's Q–32 computer in Santa Monica, referred to above, NLM can retrieve remotely bibliographic information from a large computer-based on-line file of more than 220,000 entries of which at least some 25,000 are in the subject area of biological/medical science. The link with COLEX not only enables the Library to service actual requests, but also allows experimentation with query logic and the demonstration of the capabilities of interactive searchings.

Chemical Information and Data System (CIDS)

By July 1968, the R. &. D. staff had completed arrangements to connect NLM with the Army CIDS data base of some 350,000 chemical compounds stored in some five distinct files. RISC, through a specialized typewriter and data set, will be connected with the University of Pennsylvania, contract custodian of the data base for the Army. This link will be of particular value to the Toxicology and Drug Literature Programs and to other NLM customers.

Remote Searches of MEDLARS

An IBM 1050 configuration (i.e., keyboard printers, card punch, card reader, and control unit) have been installed in RISC. Connected by data set to the commercial telephone network, this equipment permits the decentralized MEDLARS centers to transmit their search requests, in the form of punched card decks, via telephone lines to RISC where a card deck is punched automatically and passed directly to the NLM computer room for processing.

Technical Information Program (TIP)

NLM is connected by Model 37 teletypewriter with the TIP system at Massachusetts Institute of Technology. This connection permits on-line searching of the TIP data base which contains bibliographic information from some 35 physics journals over the past few years. Through RISC, NLM can experiment with TIP's unique citation indexing and retrieval of relevant information through "bibliographic coupling."

QUICKTRAN

The IBM 1050 equipment connects RISC to the IBM QUICKTRAN Time-sharing system which gives the user access to remotely located computer to assist him in solving mathematical, statistical and engineering problems.

APPLYING TECHNOLOGY TO CURRENT PROBLEMS

MEDLARS Evaluation

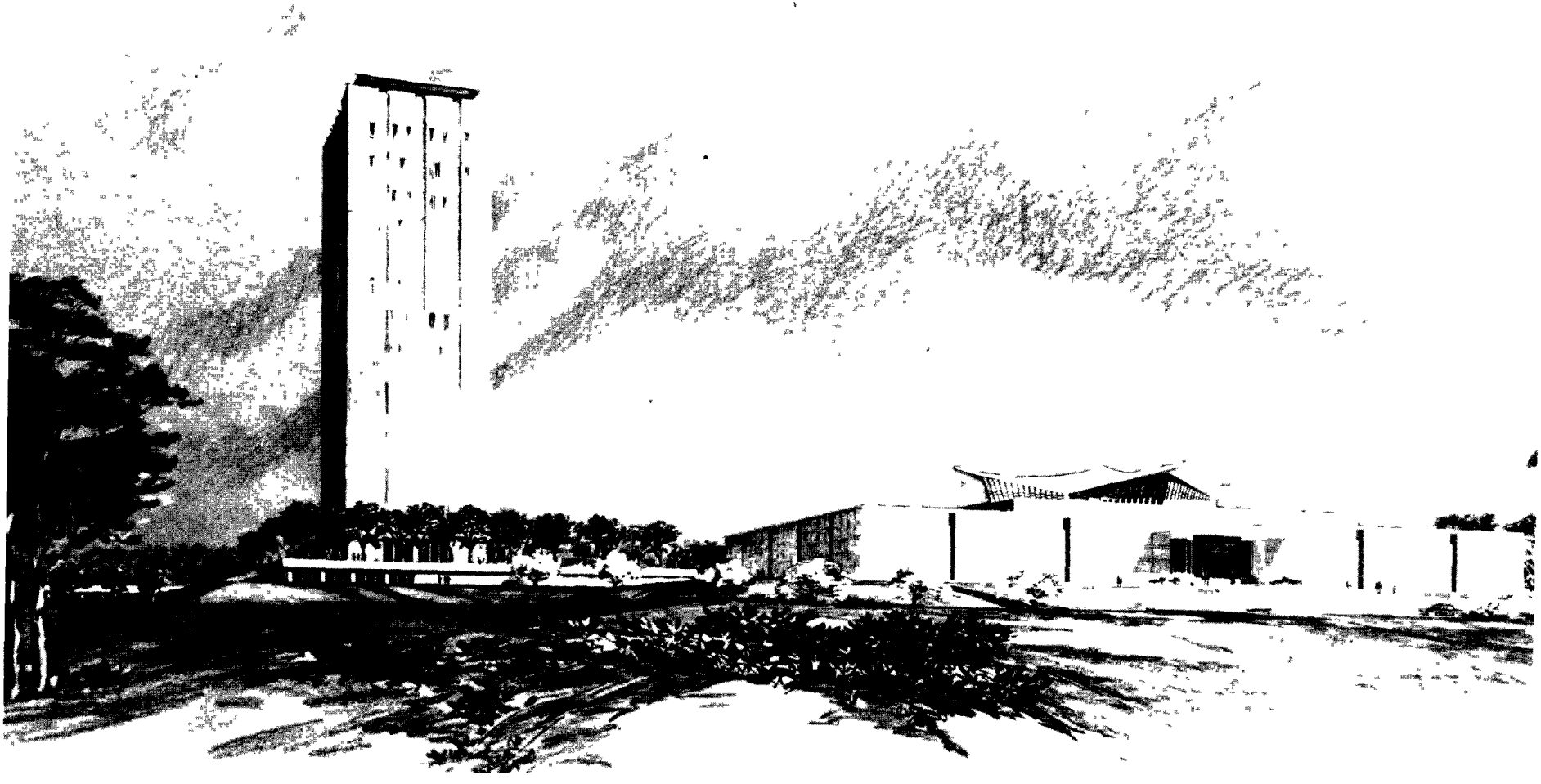
The MEDLARS Evaluation Project, initiated in May 1967 under the direction of Mr. Frederick W. Lancaster, was completed in late 1967. The project had as its goal the evaluation of the demand search capabilities of the present MEDLARS. Results of the project, a first controlled evaluation of a large retrieval system, were published in a January 1968 report entitled *Evaluation of the MEDLARS Demand Search Service.*

MEDLARS II Evaluation

The R. & D. staff was responsible for the conduct of a detailed evaluation of each of the bids received for the procurement of MEDLARS II. On 11 June 1968, the Computer Sciences Corporation of Los Angeles was awarded a contract totalling $2,037,505 for system design, development and program support. The contract did not cover computer hardware.

DEVELOPING PLANS

The R. &. D. staffs planning efforts for the Biomedical Communications Network culminated in June 1968 in the preparation of a Technical Development Plan (TDP). The TDP is the document that translates the statement of requirements into a coherent description of a network which, when operational, will satisfy the user's requirements. The TDP provides the foundation on which system engineers can postulate detailed



Architect's conception of the National Center for Biomedical Communications shown behind existing National Library of Medicine (NOTE: By Public Law 90–456, August 1968, this Center was named the Lister Hill National Center for Biomedical Communications).

network designs, formulate operating specifications, identify specific development tasks, set schedules and estimate detailed resource requirements.

The TDP defines a Biomedical Communications Network (BCN) comprised of five principal components: Library Services Component, Specialized Information Services Component, Specialized Education Services Component, Audio and Audiovisual Component, and Data Processing and Data Transmission Component. The TDP describes the BCN concept of operations, gives comprehensive details of the major essential characteristics and operating parameters of each BCN component; gives the engineering description of the communications which tie the components together and integrate them into a network; describes the BCN user groups; and summarizes the resources required for development of the BCN.

At year's end, the development plan for the Network was undergoing intensive review and coordination preparatory to the creation of the network engineering and network management plans.

Significant effort was directed to planning the National Center for Biomedical Communications (NCBC) which will be the focal point for and the vehicle for managing the entire Biomedical Communications Network during both the developmental and initial operational phases. (See page 20 for architect's conception of proposed National Center for Biomedical Communications)

The Board of Regents of the National Library of Medicine has been closely concerned with the development of the R. & D. program of the Library. The Board established an R. & D. Advisory Group, composed of Mr. Bruno W. Augenstein, Chairman, and Mr. Alfred R. Zipf, to provide review and guidance to the R. & D. staff. The staff reported in detail on the planning for the Biomedical Communications Network at the meeting of the Board of Regents on March 11–12, 1968. At that meeting the Board passed a resolution supporting the planning for the BCN and stating, in part: ". . . the Board approves the planning, design and development work now underway by the National Library of Medicine to implement the Biomedical Communications Network as a whole and in particular to implement the Specialized Educational Services Component of the Network at an early date. The Board recommends that present planning be expedited on an urgent high-priority basis.

"The Board recognizes that implementation of these services will require significant sustained funding, and urges that these funding needs be brought to the specific attention of those appropriate governmental and private organizations whose continued support will be essential for the development of the Network, and particularly the SES Component of the Network.

"In line with its previously established policy (1966) the Board reiterates its position that the NLM assume a leading role in the improvement of continuing medical education and of public education of the medically uninformed. The Board is confident that one very important means for achieving this objective is through the application of advanced communication and computer technology as evidenced in the present design and development work underway by the NLM staff."

The Network was again reviewed by the Board at the meeting June 20–21, 1968. At that meeting they also resolved: "The Board has been most impressed by the rapid pace of the NLM Research and Development Staff in proceeding with the Biomedical Communications Network (BCN), as reflected by the excellent briefings on this Network. The Board deeply appreciates the expressed keen interest, support, and enthusiasm of the higher levels of the DHEW (Department of Health, Education, and Welfare) for the BCN."

CONTRACT ASSISTANCE

Through a series of contract negotiations below, the R. & D. staff obtained the services of several university and industrial teams in solving problems related to the development of the Biomedical Communications Network:

System Development Corporation

SDS is responsible for building a data base for interrogation using the ORBIT (On-Line Retrieval of Bibliographic Text) system. The data base will be comprised of a selection of citations from MEDLARS and the Current Catalog in the area of neurology. This development and the subject area are of interest to the Parkinson Information Center and to related efforts which NLM has underway with SUNY (State Universities of New York).

Massachusetts Institute of Technology/Lincoln Laboratory

MIT/Lincoln Laboratory has established the Medical Subject Headings (MeSH) file on their time-sharing computer system. Experimentation with this capability will help define requirements for future on-line systems.

Stanford Research Institute

SRI is working on remote browsing techniques, inferential question-answering systems, and remote viewing capabilities. Additionally, SRI is responsible for reviewing the state-of-the-art in handling chemical structures representations in remote-access information systems.

Aerospace Corporation

Aerospace is responsible for the development of communications engineering concepts for the BCN with particular orientation toward the Specialized Education Services Component. System constraints identification, interconnection requirements analysis (both satellite and non-satellite), and subsystem tradeoff studies are to be made. Aerospace will assemble and supply technical information in support of immediate decisions facing the senior staff of the NLM in planning the application of communications technology to the BCN.

RAND Corporation

RAND is responsible for system design and management support in analyzing those public benefit services, primarily provided by DHEW, that might best be improved and/or initiated through the capabilities provided by the BCN. Communications linkage may be by communciations satellite, surface communications systems, or by some combination of the two. Analysis of national needs, conceptual system designs to meet these needs, and assessments of system resource requirements provide the base for the user/services design concept to be developed by RAND.

Massachusetts Institute of Technology/MAC

MIT/MAC is to provide assistance in planning an effective referral center for the toxicological information system of the BCN. As part of its work, MIT/MAC will concern itself with the design of privacy and control features as a part of the referral center concept.

EDUCOM (Interuniversity Communications Council)

EDUCOM is responsible for providing direct technical assistance in planning and developing the Library, Specialized Information Services and Specialized Education Services components of the BCN, and also, the Remote Information Systems Center. In addition, EDUCOM will provide assistance in management of the BCN development and in preparing the management concepts for managing the entire operational network. EDUCOM conducted an extensive investigation of the medical/health sciences community aimed at refining the identification of the potential users of the Biomedical Communications Network. In addition to providing valuable information about potential users and their information/communications requirements, EDUCOM also prepared descriptions of information system developments being undertaken by various users.

EXTERNAL ACTIVITIES

The R. & D. staff spent a significant amount of its time participating in external activities, serving on panels and committees,

addressing professional gatherings, establishing contacts with a wide variety of individuals both in Government and the private sector, collecting information, testing the environment, etc. All of these external activities were aimed at establishing and maintaining a presence wherever the objectives of the NLM and the Biomedical Communications Network could be advanced and served. Following is a brief listing of the major external activities in which the R. & D. staff participated:

(1) President's Task Force on Communications Policy. The Associate Director for Research and Development served as the DHEW representative on the Central Staff of the Task Force. Other members of the R. & D. staff participated in Task Force activities with a view to the possible utilization of satellite communications to meet BCN needs; (2) Federal Interagency Broadcast Committee; (3) Systems Working Group of the National Libraries Task Force; (4) Network for Knowledge. Participation has been conditioned by the fact that BCN is a likely candidate to be a major component of the Network for Knowledge which has been proposed by the Executive Branch; (5) COSATI (Committee on Scientific and Technical Information) Panel on Information Sciences Technology; (6) COSATI Task Force on Technology Utilization; and (7) Communications satellite interests.

Due to the formal and informal participation in the activities enumerated above plus the large amount of interest generated by the BCN concept, both within the various agencies of the Federal Government and with the various sectors of the private community, NLM's R. & D. staff has become the focal point of DHEW's interests in the area of communications satellites. The resultant efforts have enhanced the knowledge of the R. & D. staff, and increased its awareness of the major importance of this communications technology. The feasibility of utilizing a communications satellite to link geographical clusters of health activities for the initial operating phase of the BCN is being explored vigorously.

OFFICE OF ASSOCIATE DIRECTOR FOR LIBRARY OPERATIONS

During fiscal year 1968, the Office of Intramural Programs was reorganized into the Office of Library Operations. With the reorganization, the Office of Library Operations includes the following divisions: Technical Services, Reference Services, Bibliographic Services, History of Medicine, and a newly established Library Network Management Staff. The former Information Systems Division was transferred out to become the Office of Computer and Engineering Services under the Office of the Director, and the former Drug Literature Program was transferred to Specialized Information Services.

The Library Network Management Staff is responsible for the planning and managing of the biomedical library network. At present, this consists primarily of regional medical library services and MEDLARS station activities. The staff functions to establish policy and procedure for the effective performance of the network operations and services, and, to coordinate NLM support activities for the network.

Faced with continuing personnel restrictions imposed throughout the government, increased production requirements, and service demands, the Library expanded and extended a philosophy of decentralizing its operations. Library Operations provided policy and procedural direction to decentralized programs, monitoring such activities, and acting as a central resource of production and processing.

The expansion of the decentralized MEDLARS program, both domestically and internationally, and the establishment of the regional medical library program did much to necessitate further centralized control to obtain a higher level of performance. Specifically, the programs which caused an increased growth of decentralized activities were: the implementation of a shared cataloging program with the Upstate Medical Library program at Syracuse (SUNY) and the Harvard/Francis A. Countway Library; the extension of indexing activities to MEDLARS Centers in Japan, Israel, Sweden, and at two information centers supported by the National Institute of Neurological Diseases and Blindness; the MEDLARS demand search stations established at the University of Michigan and Baylor University; and, the expansion of the regional medical library program to include, in addition to Harvard, the University of Washington (Seattle) and the College of Physicians, Philadelphia.

As in previous years, production continued to increase even though the divisions were faced with greater workload and slight decrease in staff. High production and performance levels were maintained due to more effective management. In numerous activities, production and performance were extraordinary and achieved under very demanding conditions.

In the Technical Services Division, workload and production figures continued to rise during fiscal year 1968. The reorganization of the Selection/Acquisition Section in late fiscal year 1967, the expansion of blanket orders, and the implementation of shared cataloging activities contributed to the increases.

In January 1968, the *Current Catalog* was expanded to include technical report literature. It was decided not to generate catalog cards for the report literature, but rather to experiment with using the *Current Catalog* as a book catalog and as the only access to this material. A further service provided in the *Current Catalog*, initiated in June 1968, was the inclusion of cataloging data of Upstate Medical Center at Syracuse (SUNY) and the Harvard/Francis A. Countway Library. Citations, for titles held by SUNY and Countway, will contain the respective location symbols and call numbers of each. Thus, this past year has shown a continuing improvement of the *Current Catalog* and a further realization of the staff's desire to make the publication more useful to the biomedical

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community and, in particular, to libraries of schools of medicine.

To provide for the administrative control of decentralized MEDLARS services and quality control over its products, a MEDLARS Management Section and a Quality Control staff were established in Bibliographic Services Division. The new Section is responsible for the administration and management of the day to day production and service of MEDLARS operations, including the decentralized program; for the coordination of MEDLARS activities between NLM and MEDLARS stations, for providing means of interchange of technical information; for serving as a clearinghouse for decentralized MEDLARS searches; and for establishing and processing recurring bibliographies, *Index Medicus*, and other MEDLARS products for publication.

The Quality Control Staff is responsible for the review, analysis, and evaluation of MEDLARS products and services. It makes recommendations on possible system improvements in the areas of indexing, searching, vocabulary development, training, and journal selection; and is also responsible for the review, analysis, and editing of all NLM publications before printing.

Last year's decision to increase indexing productivity through outside sources proved both wise and fruitful. The first full year of outside and in-house indexing resulted in a 15 percent increase (from 168,310 articles to 192,923).

The 7,673 MEDLARS demand searches released during the year were 62 percent over the previous year. The ability to meet such service demands can be contributed to the success of the Library's decentralized program. Trained MEDLARS searchers are now active at the following Centers: Alabama, Colorado, Harvard, Michigan, Ohio State, Texas, and the University of California at Los Angeles.

Computer processing time to handle the increased number of demand searches was not available at NLM; therefore, processing backup arrangements were made with Alabama, Colorado, and Ohio State. To expedite processing of the heavy increase in searches it was decided to limit routine searches to a two year file of citations.

For the first time in 5 years the Reference Services Division did not experience a significant increase in services rendered. Reference questions, which the previous year had increased 15 percent decreased by 763 (almost 3 percent), from 25,514 to 24,751. Interlibrary loans dropped considerably, from 132,112 to 119,286, reflecting in part the activities of the New England Regional Medical Library at Harvard during three-quarters of the year.

Responsibility for serving as the Mid-Atlantic Regional Library was assigned to the Reference Services Division. A major emphasis toward the end of the year was given to service relationships within the biomedical library community in the mid-Atlantic states; namely, Maryland, Virginia, West Virginia, and the District of Columbia.

Also, highlighted this past year was the development of requirements for an automated "graphic image" system. Intended to retrieve journal articles in microform automatically, this system will be based on the use of existing equipment and the present state-of-the-art.

The detailed activities of Library Operations are outlined in the Division reports which follow.

TECHNICAL SERVICES DIVISION

Production within the Technical Services Division in fiscal year 1968 continued to increase (Chart VI). The reorganization of the Selection/Acquisition Section in late fiscal year 1967, the expansion of blanket order and shared cataloging programs all have had their impact on the ability of this Division to produce more with less. The Acting Coordinator for the Development of the Collection, Fritz P. Gluckstein, D.V.M., continued his work on the Scope and Coverage Manual, and a revision can be expected in September 1968. This is intended to be a working tool for the Library's selection and acquisition staff.

GROWTH OF COLLECTIONS - FY 1967/1968

BOOK MATERIAL	CURRENT YEAR ADDED	CURRENT YEAR WITHDRAWN	CURRENT YEAR NET GAIN	COLLECTION TOTALS JUNE 30, 1967	COLLECTION TOTALS JUNE 30, 1968
1 BOUND MONOGRAPHS					
A. HMD	323	0	323	36,525	36,848
B. 1801-1913	97	0	97	88,622	88,719
C. 1914-	10,941	131	10,810	202,036	212,846
SUBTOTAL (1)	11,361	131	11,230	327,183	338,413
2. BOUND SERIALS	11,382	190	11,192	325,846	337,038
TOTAL BOUND VOLUMES (1 + 2)	22,743	321	22,422	653,029	675,451
3. THESES (INCLUDING UNSEARCHED THESES)	7,861	0	7,861	295,883	303,744
4. PAMPHLET VOLUMES	190	0	190	167,653	167,843
SUBTOTAL (3 + 4)	8,051	0	8,051	463,536	471,587
TOTAL BOOK MATERIAL	**30,794**	**321**	**30,473**	**1,116,565**	**1,147,038**
NON-BOOK MATERIAL					
1. MICROFILMS	1,404	0	1,404	6,864	8,268
2. PORTRAITS AND PICTURES	1,527	0	1,527	62,917	64,444
TOTAL NON-BOOK MATERIAL	**2,931**	**0**	**2,931**	**69,781**	**72,712**
BOUND VOLUME EQUIVALENTS				*15,000*	*15,000*
GRAND TOTAL	**33,725**	**321**	**33,404**	**1,201,346**	**1,234,750**

CHART VI

The Division has been playing an active role in the work of the National Libraries Task Force on Automation and Other Cooperative Services. Division participation is as follows: National Libraries Task Force—Stanley Smith, then Acting Division Chief served as NLM's alternate member; Working Group on Subject Headings—Miss Emile Wiggins, Head of the Cataloging Section, chaired this group; Working Group on Descriptive Cataloging Practices—Miss Wiggins chaired this group; Working Group on Name Entries and Authority File—Miss Wiggins and Miss Ethel Elvove from the Cataloging Section were members; Working Group on Acquisitions—Mr. Salvatore Costabile, then Head of Selection/Acquisition Section, and now Deputy Chief of the division was a member; Working Group on Serials Data—Special Assistant to the Division Chief, Miss Elizabeth J. Sawyers, was a member.

SELECTION/ACQUISITION SECTION

The blanket order arrangements were expanded in fiscal year 1968 and now include England, Scandinavia, France, Germany, the Netherlands, and Italy. In all of these areas, NLM is using the same book dealers as the Library of Congress. This makes it possible to have publications selected for NLM shipped via the Library of Congress air freight arrangements for NLM/LC Shared Cataloging.

The Chief of the section visited European publishers, book dealers, and Library of Congress officies in May of 1968 to review the book trade practices and the Library of Congress operations in the countries visited in relationship to the blanket order operations, and at the same time to reacquaint book dealers with the Library's requirements for subject coverage. While in Florence, Italy, he completed arrangements with Mario Casalini to serve as NLM blanket order dealer for Italy. Specifically, the number of monographs processed increased 18 percent, from 23,394 to 27,698; and total publications processed increased 4 percent, from 112,301 to 116,455 (Chart VII).

CATALOGING SECTION

In January 1968, the cataloging section began to include technical reports in the *Current Catalog*. Using the COSATI rules for cataloging, technical reports are entered in a separate section of the catalog with a subject and name approach.

With the cooperation of the Library of Congress, participation in its program for Shared Cataloging was expanded. Originally this program included publications from England alone, but during fiscal year 1968 the publications of France and Germany were added.

Procedures were established for implementing Shared Cataloging programs with the Upstate Medical Library at Syracuse (SUNY) and the Francis A. Countway Library at Harvard. The cataloging which these two libraries do for titles not in NLM's collection will be entered into the *Current Catalog* with their appropriate location symbols (MBCo for Countway—

ACQUISITIONS ACTIVITIES

	1966	1967	1968
SEARCHING			
PROSPECTS CONSIDERED FOR ACQUISITION NOT IN LIBRARY	32 919	29 607	13 868
PROSPECTS CONSIDERED FOR ACQUISITION LIBRARY HAS	13 087	9 812	12 542
TOTAL	**46 006**	**39,419**	**26 410**
ORDERS PLACED	**14 775**	**14 552**	**5 025**
SERIAL RECORD			
NEW TITLES ADDED	1 925	1 168	1 299
TITLES CURRENTLY RECEIVED (as of end of year)	18 482	19 650	20 949
PUBLICATIONS ADDED			
SERIAL PIECES	80 611	88 907	88 757
OTHER	17 839	23 394	27 698
TOTAL PUBLICATIONS ADDED	**98 450**	**112,301**	**116 455**
OBLIGATIONS FOR PUBLICATIONS	**161 286**	**209 900**	**204 300**
(INCLUDED FOR RARE BOOKS)	26 319	31 095	23 564

CHART VII

CATALOGING STATISTICS

	1966	1967	1968
COMPLETED CATALOGING			
NEW TITLES	10,063	13,841	14,450
RECATALOGED TITLES	2,160	688	1,253
TOTAL	12,223	14,529	15,703
VOLUMES RECLASSIFIED AND/OR TRANSFERRED	1,595	2,598	1,070
CATALOG CARDS FILED	210,820	124,224	114,256
VOLUMES SHELFLISTED	36,230	15,813	13,005

CHART VIII

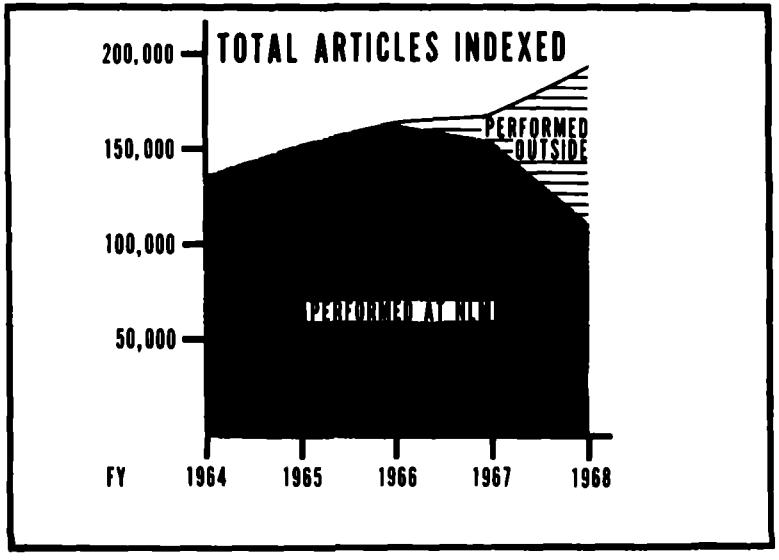


CHART IX

SUNY for the Upstate Medical Library). These programs will commence with the first *Current Catalog* biweekly issue in July 1968.

Cataloging production increased 7 percent, from 14,529 to 15,703 (Chart VIII).

VETERINARY AFFAIRS

The Advisory Panel on Veterinary Medicine continued to assist in the expansion of the veterinary vocabulary for Medical Subject Headings (MeSH).

Exhibits depicting the Library's veterinary activities were sent to various scientific meetings including the World Veterinary Congress in Paris.

The Library now receives 200 veterinary journals, an increase of 25 percent. Veterinary books in the collection have increased about 15 percent and now number approximately 2,300. The requests for Demand Bibliographies concerned with veterinary medicine increased by nearly 50 percent to a total of 200 during fiscal year 1968.

Special Projects:

(1) In preparation for the more comprehensive MEDLARS II, work continued on the consolidation of the serial record files under the contract with the J. I. Thompson Co. The contract will be completed by February 1969. (2) SUNY/NLM Shared Cataloging Project. SUNY began conversion of the *NLM Current Catalog* tapes to the MARC I format and provided programs for searching of the resultant tapes. Procedures were established for the NLM/SUNY Shared Cataloging Programs which will be implemented July 1, 1968. SUNY will also: (a) estabish a common data base for the use of between the National Library of Medicine, SUNY Biomedical Communications Network, and the Countway Library at Harvard; (b) undertake experimental batch searching of the common data base with on-line query of terminals at NLM; (c) design and evaluate an experiment to perform subject searches; (d) pre-

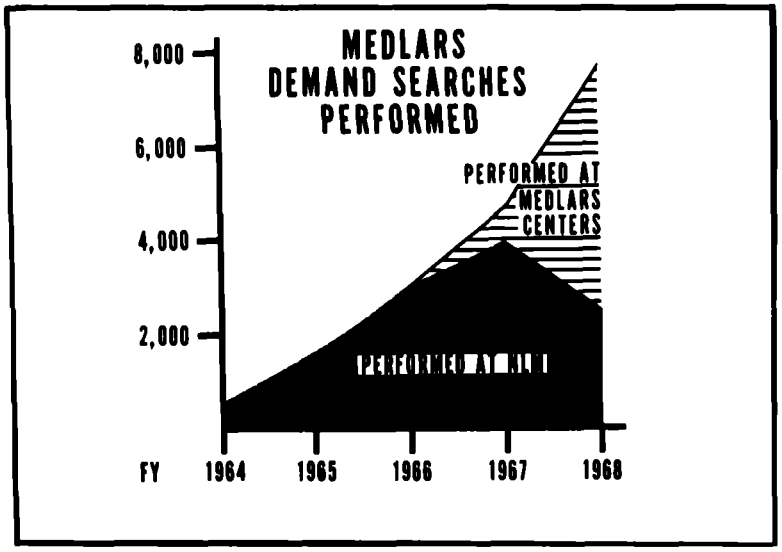


CHART X

GROWTH OF HEADINGS ON MASTER MeSH

The distribution according to the several types of entries on June 30, 1968

MAIN HEADINGS	7,356
PROVISIONALS	469
CHECK TAGS	12
GEOGRAPHICS	266
TAG OVERRIDE OF 1 HEADING	347
SUBHEADINGS	60
Subtotal	8,610
CROSS REFERENCES	4,591
	13,201

CHART XI

pare programs to convert common data base tapes from MARC I format to MARC II. (3) Conversion of 1965 cataloging project. Melpar, Inc. completed the conversion of NLM's 1965 cataloging to machine-readable form.

BIBLIOGRAPHIC SERVICES DIVISION

Indexing

During fiscal year 1968, 192,923 articles were indexed, an increase of 15 percent over the previous record production of 168,310 articles indexed in fiscal year 1967. The gain was achieved largely through the development of additional indexing resources outside the library. The outside resources include indexers at two NINDB specialized information centers, at several U.S. MEDLARS centers, at centers in Japan, Israel, and Sweden, and in the employ of two domestic contractors. The agencies were producing about 15 percent of all indexing at the beginning of the year, and about half of all indexing by the end of the year (Chart IX). There was a decrease in the amount of indexing carried on at NLM, as some of the effort of the NLM staff was diverted to training and reviewing the work of newly-trained outside indexers. As newly-trained indexers increase in experience and proficiency, the review effort may be expected to decrease.

The indexing backlog, which had received large increments in each of the 2 previous years, held almost constant during fiscal year 1968. The numerical rise from 70,000 to 76,000 articles was counterbalanced by a change in the composition of the backlog of significant material indexed in depth from 50 percent to 40 percent. Although indexing capacity now is approximately in balance with our current indexing commitments, the continued existence of a backlog and the continuous increase in the publication of literature requiring indexing precludes complacence.

Demand Searches

As mentioned earlier, the number of demand search bibliographies released to MEDLARS users in fiscal year 1968 was 62

percent greater than in fiscal year 1967. If one takes full account of those MEDLARS searches produced without direct NLM financial support of the professional or computer operations, the fiscal year 1968 domestic production of demand searches increased by about 71 percent.

The Library's ability to respond to the continued growth of demand for MEDLARS services was made possible by the addition of newly-trained searchers to the staffs of four existing centers, the activation of the MEDLARS center at the University of Michigan, and the inception of a center in Texas, independent of NLM support. The MEDLARS centers provided less than 20 percent of the professional effort involved in search formulation in fiscal year 1967, but accounted for more than two-thirds of the 8,100 MEDLARS searches performed in the United States in fiscal years 1968 (Chart X). The development of this capacity in the MEDLARS Centers has made it possible to divert some of the NLM search personnel to other essential activities including searcher training, the development of additional recurring bibliographies and literature searches, and quality control of MEDLARS Products.

Processing of the increased number of demand searches put a strain on the capacity of NLM computer. During the last quarter of fiscal year 1968, this was alleviated by arrangements to have part of the load handled by the computer at Ohio State University, as well as at the Universities of Colorado and Alabama and by reduction of the size of the file searched. A continuing use of these facilities is anticipated. Demand search throughput times, which had become longer than desirable during the winter, were back to acceptable levels.

MEDLARS Management

The progressive decentralization of MEDLARS activities from NLM to MEDLARS Centers, both in the United States and abroad, has produced augmented communication loads. Personnel in the Centers must be kept current on all developments and changes in MeSH, and in NLM indexing policy and practice, as well as any modifications of NLM computer programs, workflow, or workloads that may affect their operations. Tapes at Centers engaged in computer operations must be replaced periodically with file-maintained tapes, and each month's increment to the tape file must be distributed. Problems and questions arising in the Centers must be responded to with tapes, documentation, or suggestions. NLM obtains week-to-week information about each Center's capacity and workloads, in order to maintain optimum system performance by switching workloads, both professional and computer, from Center to Center, as necessary. Searches, in-process and completed, must be shipped and accounted for.

These essential network functions will continue to grow as the number of MEDLARS centers increase. A MEDLARS Management Section was organized in Bibliographic Services Division to take over these management functions, and to expand and streamline them.

Quality Control

In January 1968, *Evaluation of the MEDLARS Demand Search Service*, by F. W. Lancaster, Deputy Chief of the Bibliographic Services Division, was published by the Library. This evaluation, based upon a thorough study of 300 demand searches, is a source of much useful information concerning the strengths and weakenesses of MEDLARS as a bibliograhic citation retrieval system during 1966 and early 1967, when the study was performed. MEDLARS is a dynamic system in every respect. The staff involved in all phases has expanded greatly. The vocabulary and many other aspects of the system have been undergoing rapid change. In order to access current system performance, and to identify factors tending to produce irrelevance or incompleteness in MEDLARS products, an ongoing evaluation must be maintained.

During fiscal year 1968 plans were developed for a small staff, in the Office of the Chief, Bibliographic Services Division, to monitor MEDLARS quality, including the quality and the consistency of indexing, as well as the characteristics of the searches and bibliographies produced. This staff is expected to concentrate its efforts on providing information as a basis for inaugurating improvements in system procedures and practices. This group will also do the preparatory work that is required to allow NLM to derive the greatest advantage from the deliberations of the Committee on Selection of Literature for MEDLARS, the advisory group concerned with the quality of the literature indexed for MEDLARS.

Training

The training of personnel in indexing and searching continues to receive emphasis as the system continues its rapid growth. The Deputy Chief of the division was assigned responsibility for the development of an integrated curriculum to enhance the coherence of the training which had been delegated to the Indexing, MeSH, and Search Sections.

Sixty persons received indexing training consisting of attendance at the didactic sessions combined with two or more months of supervised practice. About half of these were trained to function primarily as indexers. The other half subsequently received MEDLARS search training. Since many completed their training late in the year, the full impact of this training effort upon indexing capacity will not be apparent until fiscal year 1969. The 30 persons who either completed search training or were nearing completion of training at the close of the fiscal year exceed the total number of MEDLARS searchers trained in all previous years combined.

Two successful 3-day workshops were conducted during the year. These were attended by both BSD staff and the staff of U.S. and foreign MEDLARS Centers. They served to update all attendees concerning developments at NLM and in the field, and to provide an opportunity for face-to-face exchange of experience and ideas concerning constantly changing professional problems.

Publications

In previous years, a monthly *Bibliography of Medical Reviews* was included in each monthly *Index Medicus*, and an annual *Bibliography of Medical Reviews* was published as a separate volume. This year, the annual *Bibliography of Medical Reviews* was included in the *Cumulated Index Medicus* for 1967. No separate annual was published. Since January 1968 this monthly B.M.R., in addition to appearing in *Index Medicus*, has been published separately. Annual subscriptions to the monthly are now available through the Superintendent of Documents.

Recurring Bibliographies

Three new recurring bibliographies began publication during the year. The *Endocrinology Index* is produced for publication by the National Institute for Arthritis and Metabolic Diseases. The *Bibliography of Surgery of the Hand* is produced for publication by the American Society for Surgery of the Hand. The *Toxicity Bibliography*, produced by the Bibliographic Services Division in cooperation with the Drug Literature Program is published by NLM. Additional bibliographies to which the library is committed were brought to an advanced state of development, assuring the start of publication in fiscal year 1969. See appendix for total list of MEDLARS products.

MEDICAL SUBJECT HEADINGS

MeSH Revision

The 1968 revision of *Medical Subject Headings* was published as Part 2 of the January *Index Medicus*. The total number of new main headings added was 679, and 89 were deleted, 168 provision headings were converted to main headings, 19 were

deleted, with 414 remaining in the system for further study. The total number of main headings available for indexing and cataloging was 7,356. In addition seven new subheadings were introduced which brought the total to 60. The major areas covered by the new headings were in the fields of genetics, drugs affecting the autonomic nervous system, the behavioral sciences, and medical care. For growth of Headings on master MeSH, see Chart XI.

Category and Tree Structures

The revision and expansion of the medical care terminology resulted in the need for a complete reorganization of the category relationships. This was accomplished by the introduction of a new category, N, with four separate subcategories. One subcategory described the demographic; a second, the facilities, manpower, and services available for health care; a third, the economics of and social controls provided for health care; and, a fourth the administration and organization of health care. Only minor alterations were made to the categorical structure of the remainder of the vocabulary.

COMMITTEE ON THE SELECTION OF LITERATURE FOR MEDLARS

The Committee advises the Library concerning the selection not only of journals, but of all other types of medical literature which might be considered for inclusion in MEDLARS, or in any of the MEDLARS products. The Committee members are: William B. Bean, M.D., Professor and Chairman, Department of Internal Medicine, University of Iowa; Morris Fishbein, M.D., Editor, Medical World News; Walsh McDermott, M.D., Livingston Farrand Professor of Public Health and Preventive Medicine, Cornell University Medical Center, and Editor, American Review of Respiratory Diseases; Franz J. Ingelfinger, M.D., Professor of Medicine, Boston University School of Medicine, and Editor, New England Journal of Medicine; John H. Talbott, M.D., Emeritus Professor of Medicine, University of Buffalo, School of Medicine, and Editor, JAMA; Mr. Thomas P. Fleming, Professor of Library Service and Medical Librarian, Columbia University, as well as Consultant to Academic Press, Inc., and to Johnson Reprint Corp.; Mr. William K. Beatty, Librarian and Professor of Medical Bibliography, Northwestern University Medical School; Miss Myrl L. Ebert, Chief Librarian, Division of Health Affairs, University of North Carolina; Mrs. Phyllis V. Parkins, Director and Trustee, BioSciences Information Service, Publisher of Biological Abstracts, Philadelphia, Pa.

REFERENCE SERVICES DIVISION

The year was one of preparation for the growing demands resulting from implementation of Library network operations and transition into newly developing areas. Special attention was given to the organization of management information for use in the regional medical library network as well as internally. Studies were also conducted in such areas as microfilming specifications, shelf organization and the related growth of the collection problem.

A major effort was devoted to the design of an effective graphic image system with potential application in other libraries. At the beginning of the year, eight tasks relating to retrieval system development, product and process evaluation, and hardware development were assigned to the NLM/NBS * Project Task Force for Graphic Image Study. About mid-year, it became apparent that a major effort was needed to evaluate the use of a number of recently promising automated retrieval devices. Work during the second half of the year was concentrated in this area, and resulted in development of criteria for a high access storage and retrieval system which could be implemented by the use of existing devices.

* National Bureau of Standards.

REFERENCE SERVICES

	1966	1967	1968
REQUESTS BY TELEPHONE	9,971	11,636	11,871
Government	(5,381)	(5,731)	(5,432)
Non-government	(4,590)	(5,905)	(6,439)
REQUESTS BY MAIL	1,489	1,418	1,300
Government	(192)	(221)	(196)
Non-government	(1,297)	(1,197)	(1,104)
READERS ASSISTED	10,411	12,460	11,580
Government	(3,934)	(4,453)	(3,639)
Non-government	(6,477)	(8,007)	(7,941)
TOTAL	21,871	25,514	24,751
Government	(9,507)	(10,405)	(9,267)
Non-government	(12,364)	(15,109)	(15,484)
READERS COUNTED	27,418	31,666	31,671

CHART XII

CIRCULATION STATISTICS 1968

	1966	1967	1968
REQUESTS RECEIVED	278,340	278,580	261,938
REQUESTS FILLED	243,424	239,857	220,633
REQUESTS UNFILLED	34,916	38,723	41,305
Rejected	(8,652)	(3,446)	(6,290)
Not available	(26,264)	(35,277)	(35,015)
PERCENTAGE OF REQUESTS FILLED (1)	90.3%	87.2%	86.3%
ITEMS USED BY MAJOR CATEGORY			
READER'S REQUEST	91,637	91,622	93,794
INTERLIBRARY LOANS	151,787	148,235	126,839
Photocopy	(145,076)	(141,230)	(120,021)
Original	(6,711)	(7,005)	(6,818)

CHART XIII

Considerable time was devoted to consultation and cooperation in developing policy and procedures which will become the guidelines for the operation of the system of the regional medical libraries, now being implemented.

REFERENCE SECTION

Services

The demand for reference services decreased slightly in fiscal year 1968. The total number of reference inquiries received (24,751) (Chart XII) was 3 percent lower than that for last fiscal year and the number of reader requests handled (101,881) was 0.4 percent below the figure for fiscal year 1967. Reader registration was practically negligible. A further slight decline is expected during the coming year in both readers registered and reference inquiries, as controls for identifying qualified users on registration are implemented.

Preliminary plans for a Reader Service Data Collection System were devised and the first phase implemented late in the year. Reader registration, with assignment of a registration code number denoting both occupation and organizational affiliation, is the initial step in the system design. Ultimately, the system will provide a variety of data relating to users and to document usage.

Projects and Publications

Medical Reference Works 1679–1966, compiled by Mr. Charles A. Roos, RSD and Dr. John B. Blake, HMD, and described in the History of Medicine Division section of this annual report, was one of the major bibliographic efforts of the Reference Section this year. Work was begun on the first biennial supplement, which will be published in the *Bulletin of the Medical Association.*

Paperback Books on Health and Medical Subjects, a selected list of currently in-print, inexpensive books for the student or layman, was revised by Mrs. Mary W. Clark, and issued in

January. Final drafts of a *World List of Medicolegal Serials*, and a directory of *Medical Research Institutions Named after Medical Men*, were completed by Dr. Jaroslav Nemec, and are undergoing final editing. A bibliographic commentary on *Searching the Neoplastic Literature*, prepared by Miss Virginia MacDonald, is being reviewed for possible publication.

Contributions were made by the staff to three exhibits presented in the Library during the year: *Space Medicine*, *History of Pharmacology*, and *Law and Medicine*.

Dr. Jaroslav Nemec prepared a booklet *Highlights in Medicolegal Relations* for this last named exhibit.

LOAN AND STACK SECTION

Circulation requests received (261,938) fell 16,500 from last year's figure. There were also 16,000 fewer interlibrary loan requests and 500 fewer reader requests. For overall circulation statistics see Chart XIII.

Contributing factors for the decrease in demand include: (1) the initiation of regional medical library service for the six New England States; (2) the establishment of a list of over 100 journals presumed to be widely available and which would not be supplied if the article requested was from a volume published within the last 6 years; and (3) the application of more stringent monitoring of foreign requests, requiring borrowers from abroad to list libraries in their own or neighboring countries which could not supply the material. In addition, the shift of material published before 1870 to HMD resulted in transfer of a certain number of loan requests to that Division. With the implementation of Regional Libraries, interlibrary loan requests for more readily available literature will be handled by these centers. Therefore, the requests referred to NLM will be those representing problems and a greater rate of effort will be required to satisfy such loan requests.

The restrictions imposed on servicing widely held journals and on foreign interlibrary loans, resulted in a doubling of the rejection rate.

Throughput time for interlibrary loans averaged 4 working days for 75 percent of the requests completed.

There was a steady increase in the use of TWX for interlibrary loans. The total of 6,684 requests by TWX for fiscal year 1968 was more than double last year's figure. A further increase is anticipated. A telephone report procedure for non-available TWX requests was instituted, and informal reports from borrowers show this service to be much appreciated and helpful in speeding service.

The Biological Sciences Communication Project of George Washington University completed its study of interlibrary loans for fiscal year 1967. The report is due in mid-August 1968.

At the end of fiscal year 1968 the Library contracted to evolve, test, and utilize a system for the collection of data on interlibrary loans and reader requests and for the preparation of statistical reports based on a sample of 1968–69 activity.

The section cooperated with the Institute for Advancement of Medical Communication in a study of interlibrary loan activity and document delivery in August 1967.

PRESERVATION SECTION

The HEW binding services contract for fiscal year 1969 was awarded to the Oxford Bookbinding Company in Philadelphia. Two significant changes from previous contracts were incorporated. One provides for book plating of Permabound volumes and pamphlet type bindings. The second change provides for a new pamphlet type binding for multi-signature material, replacing the more expensive Class A binding. Under the new contract the cost per volume for Class A bindings, which comprise the largest group of materials, increased by 4.3 percent.

Announcement of an award for construction of a film vault on C-level for storage of archival microfilm was made this past

year. The design of the vault, scheduled for completion by late summer, included provision for temperature and humidity control at the levels recommended by the National Bureau of Standards and the standards proposed by the United States of America Standards Institute for storage of archival film.

Collation activities increased to 3,170,000 pages, a 23-percent increase over the previous year. Editing, done on a sampling sample basis, increased 20 percent to 1,204,000 pages. The number of film reels added to the archival collection declined from 1,777 in fiscal year 1967 to 1,534 in fiscal year 1968. Holdings for 220 serial titles on microfilm were reported to the Library of Congress for the inclusion in the *National Register of Microforms Masters.*

As a part of the evaluation of titles to be selected for preservation filming, catalogs of commercially available microforms and reprints are checked regularly. Titles available in either form are not being filmed.

Two microfilm contracts for one million pages each, awarded late in fiscal year 1966, were completed in September 1967. From these contracts, 1,297 reels of archival film and an equal number of printing masters were added to the collection.

PHOTODUPLICATION SECTION

Total microfilming production (2,430,622) declined 16 percent, a drop of 483,000 filming units. Card filming (348,728) decreased by 60,000 cards, preservation filming by 87,000 pages and interlibrary loan microfilming declined by 377,000 pages. In film and paper processing, production for the year exceeded that of fiscal year 1967 by 4,000 units (from 278,000 to 282,000 units). Included in this total is the output from photo composing equipment, which increased from 96,000 pages to 124,000 pages, offsetting a 24,000 unit decrease in microfilm processing.

Hard copy production (CopyFlo pages, Xerox 914 exposures, photostats and photoprints) declined to 1,934,000 units this year, a decrease of 463,000 from the previous year. CopyFlo production decreased by 490,000 pages, but Xerox 914 usage increased by 26,000 exposures.

Xerographic card production decreased 12 percent from 448,000 to 389,000 cards. Included in this total were 265,000 cards for the name, subject and shelflist files, some 5,000 fewer than last year; 47,000 cards for the selection and ordering process, a sharp decline from the previous year when 114,000 were produced; and indexers authority cards and miscellaneous projects which increased from 64,000 in fiscal year 67 to 77,000 this year.

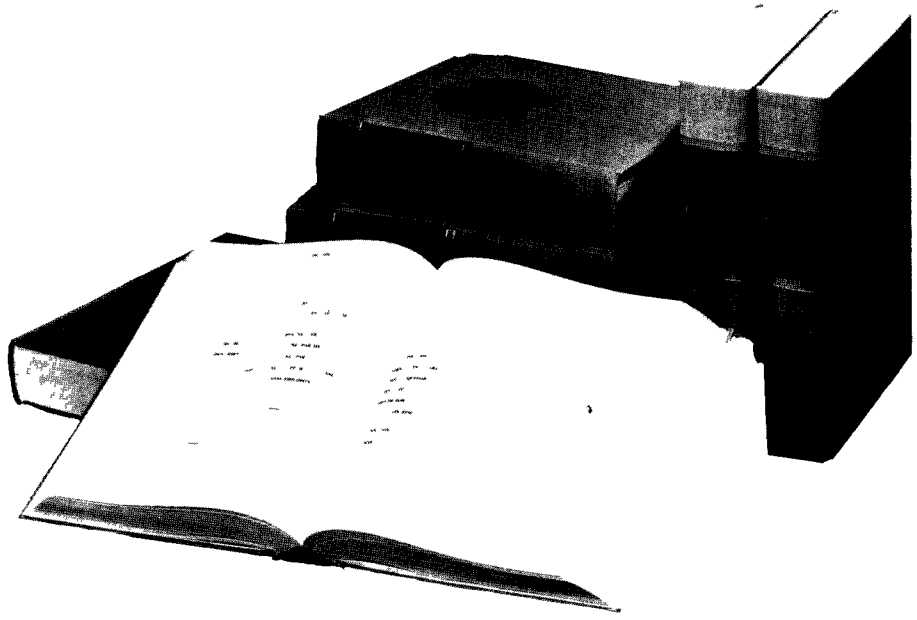
For the second year in a row, production of direct duplicate films was hampered by problems with film stock. During the year, 592 reels of film were duplicated. In the coming year, this process will be replaced by diazo direct duplicate copy process utilizing a recently installed film duplicator acquired as surplus from another Federal agency.

Over 2,500 prints, negatives and slides were produced this year. This is roughly two-thirds of last year's production. Some upswing was noted in color work which represents a relatively small amount of total production.

New equipment received during the year included an 18" x 24" screen microfilm reader for quality control work, a Simtron Electronic analyzer for color print control; a "Filmac 300" reader printer, a specially built diazo mocrofilm processor, and a Model "J" ozalid film printer and processor.

DENTAL AFFAIRS

The Office of the Coordinator for Dental Affairs, under the direction of the Resident Dental Consultant, conducted a second Ad Hoc Conference on Continuing Dental Education. With the aid of an Advisory Committee, a number of recommendations were developed from the reports of the two Conferences and presented to the Director for his use in determining the role and mission of the Library in this area.



HISTORY OF MEDICINE DIVISION

Two major achievements were recorded during the 1968 fiscal year: the publication of *A Catalogue of Sixteenth Century Printed Books in the National Library of Medicine*, compiled by Richard J. Durling, and the transfer of some 430,000 additional items from the Library's general collection to the History of Medicine Division.

Sixteenth Century Catalogue

The Catalogue of Sixteenth Century Printed Books describes over 4,800 works printed between 1500 and 1600 in the collections of the Library. It brings together for the first time in one convenient volume a comprehensive catalog of material heretofore scattered through the 58 volumes of the first four series of the *Index-Catalogue* and unpublished card files available only in the Division. It thus reveals for the first time a true picture of the variety and richness of the Library's holdings of 16th century books. Because of the size, breadth, and depth of the Library's collections, it will stand as a major bibliographic work of permanent reference value.

The importance of the Catalogue to persons interested in the history of medicine throughout the world is obvious. Its importance to all scholars interested in the transmission of classical knowledge and the civilization of the Renaissance is perhaps less obvious but nonetheless significant. Students of modern languages, for example, may find unexpected material for research in the nearly 30 percent of the imprints that were published in the vernacular. Geographical and name indexes of printers and publishers will be particularly helpful to the historian of printing.

Nineteenth Century Collection

The second major development during the past year in the History of Medicine Division was the transfer to the Division of all the Library's holdings published between 1801 and 1870, together with certain other groups of material printed after 1870, chiefly pamphlets and theses. The primary purpose of this move was to provide increased protection and special handling of a substantial portion of the Library's collection which is used primarily for historical purposes, and which is also becoming increasingly scarce and valuable with the passage of time. The date 1870 was selected because the marked deterioration of paper manufactured after that date puts long-term preservation of the original into a different category of problem. This shift enlarges the collection of printed material under the Division's care from approximately 61,000 pieces to nearly 500,000. This has resulted in a substantial increase in requirements for public service, cataloging and catalog maintenance, and collection maintenance. With no increase in personnel, commensurate losses have been sustained in time available for rare-book cataloging and research.

Circulation and Service

During 1968, the number of volumes provided from the historical collections to readers in the Library increased 62 percent. The number of interlibrary loans or special photographic orders for textual material completed increased 260 percent. In part this continues a trend already evident—reader requests increased fivefold during the preceding five years—but the jump in outside circulation may be attributed primarily to the demands for 19th century imprints previously handled by the Reference Services Division. A smaller, but still significant increase, was registered in reference work.

Cataloging

Transfer of the 19th century material has also imposed on HMD the need to spread its cataloging more widely. Much of the material transferred represented the residue not yet processed under the Library's recataloging program, started in 1949. To complete the most important and heavily used portion of this backlog, one of two catalogers working on 17th century monographs was reassigned to 19th century serials. Progress on the early imprints was accordingly slowed, and the number of monographs cataloged declined by 45 percent.

Acquisitions

A substantial number of early printed works were added to the Library's holdings during the year.

One, Hippocrates' *De insania Democriti philosophi facetum epistolium*, published in Augsburg by Hans Froschauer, is generally listed in the standard bibliographies of incunabula, but may more properly be dated on the basis of internal evidence, as not before 1503. Among other 16th century works were the second, fourth, and fifth French editions of the works of Ambroise Paré. Many of the acquisitions were in basic sciences related to medicine, particularly chemistry, while others strengthened further the Library's already outstanding holdings of such well known medical authors as Herman Boerhaave and Albrecht von Haller.

Though rich in early printed books, the Library possesses a few early western manuscripts. Opportunities for adding to this collection rarely present themselves, and when they do, the price is usually prohibitive. An effort to overcome this serious gap in our resources through the acquisition of early medical manuscripts on microfilm, noted in last year's report, has continued during the year. Altogether, 582 manuscripts from 71 different libraries have been acquired and cataloged to date. A preliminary brief listing by provenance was being prepared for publication at the end of the year.

Gifts

Additions to the modern manuscript collection included the papers of Alan Gregg, who for years played a very important

role in the growth of American medical institutions. These were the gift of Mrs. Gregg. Mrs. Ernest L. Scott gave the papers of her husband, including original notebooks and letters relating to his experiments on depancreatized dogs and the preparation of an insulin extract in 1911. Other gifts were received from Dr. Stanhope Bayne-Jones (Eclat Club papers), Dr. William B. Bean, Dr. Chauncey D. Leake, Mrs. Louis L. Williams, and Theodore Wiprud.

Oral History

Completed oral history interviews added to the Library's new collection in this field included tapes and transcripts of interviews, prepared under contract with the Extramural Program by Dr. Harlan Phillips, with Senator Lister Hill and Albert Szent-Gyorgyi. An extended interview by Dr. Peter D. Olch of HMD with Dr. Albert Baird Hastings was completed but not fully processed by the end of the year.

Prints and Photographs

The Prints and Photographs collection was enriched during the year by an unusually large number of original prints. These included a substantial number of works of 20th century artists, ranging from World War I Red Cross posters of James Montgomery Flagg to lithographs by Käthe Kollwitz and Paul Wunderlich. More traditional engravings and other portraits of physicians were also added, including a selection of 103 from a private collection. An outstanding personal collection of photographs was received from Mr. Roy Perry illustrating the early days of the National Institutes of Health.

Resources for illustrating social aspects of 19th century medicine were enlarged through the acquisition of copy negatives of woodcut illustrations from *Harper's Weekly*. Interest in the collection and use of photographic reproductions of material in the collection for publication and other purposes continued to rise. The preparation of a number of lists on special topics, such as communicable diseases and public health, medicine and the sea, mental disorders, music and medicine, ophthalmology, pharmacy, surgery and anesthesia, the U.S. Public Health Service, and veterinary medicine, has been of substantial assistance in answering reference requests. The publication of an illustrated list of *Prints Relating to Dentistry* proved particularly popular.

Publications and Research

In addition to the *Catalogue of Sixteenth Century Printed Books*, the Library published from the History of Medicine Division the second number of the *Bibliography of the History of Medicine*, covering approximately 2,600 citations indexed in 1966. Several improvements in format were introduced as a result of experience with the first issue. The third issue was prepared during the year and the manuscript submitted to the printer in May.

A joint effort of the Reference Services Division and the History of Medicine Division, edited by Dr. John Blake and Mr. Charles Roos, was published by the Medical Library Association: *Medical Reference Works, 1679–1966; a Selected Bibliography*. This bibliography represents a thorough revision of the bibliography included in the MLA *Handbook of Medical Library Practice*. It includes some 2,700 annotated citations to indexes and bibliographies, directories, histories, and other works of medical reference, both current and noncurrent. A substantial proportion are of potential interest to medical historians. For this work the editors received the Ida and George Eliot Award of the Medical Library Association.

Several members of the staff have under way long term research projects. During the year Mr. Richard J. Durling, Curator of Early Western Manuscripts, continued work on the catalog of medieval translations of Galen and on the preparation of a critical text of Burgundio's 12th-century version of Galen's *De temperamentis*. Dr. Peter D. Olch, Deputy Chief, is continuing research for a biography of William Stewart Halsted. Mr. Manfred J. Waserman, Manuscripts Librarian,

spent 3 months on leave of absence at the Charles Warren Center for Studies in American History at Harvard University to prepare a section on child health for a work on the history of the child and the state. Dr. John B. Blake organized and chaired a conference on the History of Drug Control, sponsored jointly by the Library and the Josiah Macy, Jr. Foundation and held at the Library in May. He will edit the proceedings for publication.

OFFICE OF ASSOCIATE DIRECTOR FOR EXTRAMURAL PROGRAMS

The Medical Library Assistance Act of 1965 authorized a grants program to assist in the construction and expansion of medical library facilities, the improvement of library resources, the training of medical librarians and other health science information specialists, the conduct of research on the organization and dissemination of health sciences information, the support of biomedical scientific publications, and the development of a national system of regional medical libraries. Through this Act, which is administered by the NLM Extramural Programs, the following awards have been made in fiscal year 1968 (Chart XIV): 9 construction grants, 373 resource grants, 15 training grants, 3 fellowships, 3 special scientific project grants, 60 research grants and contracts, 19 publications grants and contracts, and 3 regional medical library grants.

The response to and utilization of opportunities and financial assistance provided by the Medical Library Assistance Act is clear evidence of the need and the potential for progress in the improvement of biomedical information organization and dissemination. The following sections offer some examples and a summary of programs, projects and activities during fiscal year 1968.

BIOMEDICAL COMMUNICATIONS RESEARCH

Maximum effectiveness in medical education, research and practice is dependent on the full and rapid flow of biomedical knowledge. To improve knowledge availability in the health sciences the Medical Library Assistance Act authorizes grants to encourage and assist research on medical library and information system problems, to design and evaluate new techniques and systems for the organization and dissemination of information, and to study the flow and use of knowledge.

During fiscal year 1968 the NLM Extramural Programs awarded 60 research grants and contracts. These projects included a study at the University of Chicago on experimental methods for the dissemination of biomedical literature, and a study at Northwestern University on the information environments of researchers.

The Institute for the Advancement of Biomedical Communications has been supported in the development of methods for evaluation of biomedical libraries. A related project conducted by the University City Science Center in Philadelphia surveyed library services at 95 major health science libraries in the United States.

A project at Albany Medical College is developing self-instructional materials for continuing education of practicing physicians. The Center for Research on the Utilization of Scientific Knowledge at the University of Michigan is studying the flow of medical information and the communication processes in the general hospital. The American Medical Association has a grant to assist in the development of a methodology for a statistical survey of health science libraries in the United States.

Other projects have been studying the relationships of biomedical information services, the use of computers for various medical library procedures, and new techniques for indexing information.

The Library's program includes support for research in the history of medicine. Research grants have been awarded for more than 20 projects which include local and regional medical histories, biographies of medical leaders, and histories of specific diseases.

Research projects often require two or more years before significant results are obtained and although most projects are only in the first or second year of research there are indications of good progress which should yield some useful and rewarding results.

TRAINING GRANT PROGRAM

The NLM training grant program, authorized by the Medical Library Assistance Act, assists in the initiation and support of a limited number of graduate and postgraduate training centers located in schools of library science, information science, medicine and other professional and graduate schools. An important characteristic of these programs is their interdisciplinary and interdepartmental composition, including library science, information science, systems engineering, linguistics, and biomedical sciences. Most training activities are developed in conjunction with strong biomedical teaching and research programs so that the research pursued by the graduate students in medical librarianship or information science can be conducted in an appropriate environment.

In fiscal year 1968 five academic programs in biomedical librarianship were supported at the University of Chicago, University of Minnesota, University of California at Los Angeles, Case Western Reserve University, and University of Illinois. Five postgraduate internship programs were supported at the University of California at Los Angeles, Washington University, University of Tennessee, Johns Hopkins University, and Wayne State University. A doctoral program for biomedical science information specialists at George Washington University continued during fiscal year 1968, and a new graduate program in biomedical communication based at Tulane University was initiated. A grant was awarded to Rockefeller University to assist a new training program for executive editors of biomedical journals. Graduate programs in history of medicine at Yale University and Johns Hopkins are continuing. In the planning stage are additonal new training programs in biomedical communications research and health sciences information systems administration.

MANPOWER STUDIES

An extensive and comprehensive nationwide survey of medical library personnel is being directed by Dr. David Kronick and Mr. Alan Rees with the assistance of the Medical Library Association Advisory Council on Continuing Education and a panel of consultants. The objectives of this study are to gather personnel data on present medical library manpower, to determine the manpower needs and requirements to staff current and future libraries and information services in the health sciences, and to design new educational programs for various categories of personnel.

An exploratory and experimental study of the educational characteristics and needs of hospital librarians is being conducted by Mr. Alan Rees at Case Western Reserve University. The aim of this project is to design, develop and evaluate training programs for hospital library personnel.

A conference on education for health science librarianship was held at the University of Washington and several hundred copies of the published proceedings were distributed to medical schools, library schools, professional associations, and appropriate government agencies.

A 3-year research program on manpower in librarianship and information science, directed by Dr. Paul Wasserman at the University of Maryland, was activated, and a report of progress on the first phase has been published in a professional journal.

CONSTRUCTION PROGRAM

The Medical Library Assistance Act authorizes grants to aid in the construction of new medical library facilities and the renovation, expansion, or rehabilitation of existing libraries. The Facilities and Resources Division is responsible for the administration of the construction program. Architectural and engineering services (including construction management) are

provided by NIH's Architectural and Engineering Branch of the Division of Research Facilities and Resources.

In the first two years of the construction program 36 applications for construction grants were received and 21 were approved. The allocation of $10,000,000 for the combined fiscal years 1967–1968 enabled the Library to award nine construction grants to the following: The Jefferson Medical College of Philadelphia; University of Nebraska College of Medicine; Wayne State University; Rutgers—the State University; George Washington University; Southern College of Optometry; University of Texas Medical Branch; Boston University School of Medicine; Brown University.

RESOURCE GRANT PROGRAM

The Medical Library Assistance Act authorizes grants to public or private non-profit institutions for the purpose of expanding and improving basic medical library resources. Resource grant funds may be used for the following: (1) acquisition of books, journals, films, tapes, photographs, or other informational material; (2) expenses of cataloging, binding, or other services necessary for processing library materials; (3) procurement of duplicating devices, facsimile equipment, film projectors, recording equipment, or other equipment to facilitate the use of library resources; (4) costs of introducing new technologies in librarianship; and (5) other individually described and justified items related to the operation of the Library.

The basic purpose of the Resource Grant Program is to strengthen individual health science libraries by improving and expanding their resources, thereby increasing the capabilities of the libraries to provide improved services to professional personnel. Since the inception of this program in late fiscal year 1966, applications have been received from 431 libraries. The geographic distribution of the applicants and identification of the types of institutions represented are shown in Chart XV. Resource grants have been awarded to 375 libraries since the program began in June 1966. Chart XVI shows the geographic distribution and the type of institution to which these awards were made. During fiscal year 1968 new grants were activated for 119 libraries, second-year support was extended to 251, and third-year support was approved for three.

Most of the libraries receiving support under the Resource Grant Program are utilizing these funds to expand their basic collection of books and journals or to acquire indexing or reference tools to improve access to the literature. In addition, several institutions that are already maintaining extensive collections are finding it possible to improve library services by implementing new programs that were previously not possible within the limitations of institutional budgets.

Grant funds at these institutions are providing support for such things as: automation of processing procedures, production of union lists, improvement of catalogs, addition of staff to provide expanded bibliographic service, improvement and expansion of interlibrary loan procedures. This grants program is providing assistance for many immediate and urgent needs in medical libraries.

A national network of regional medical libraries is envisioned in the Medical Library Assistance Act which authorizes appropriations to "assist in the development of a national system of regional medical libraries, each of which could have facilities of sufficient depth and scope to supplement the services of other medical libraries within the region served by it."

The objective and purpose of regional medical library services is to optimize and equalize access to, and to provide for the most effective dissemination of health science information in all its forms, in order to respond effectively to the needs of health science investigators, practitioners, educators, and students. Grant funds are intended to assist in providing services to: (1) public and private institutions with programs of health professional education, service and/or research; and (2) individuals

engaged in these or related fields who lack access to libraries through which to obtain such services.

Grants may be utilized to improve, augment or strengthen regional services of those libraries already providing a base of such services. Grant funds are not to provide substitute support for present interlibrary services; rather, they will augment present capability to provide these services more extensively and more rapidly.

The number of regional libraries which can be supported by the present Medical Library Assistance Act is estimated at approximately 10. Each will have to provide services for a relatively large portion of the nation's health professional manpower, or in certain cases, for a large geographic area of the country.

In October 1967, the first regional medical library commenced operation at the Francis A. Countway Library of Medicine at Harvard and is known as the New England Regional Medical Library.

In June 1968, the College of Physicians of Philadelphia Library received an award to establish and operate the Mid-Eastern Regional Medical Library which includes the area of Pennsylvania, Delaware, and Southern New Jersey.

The University of Washington Health Sciences Library received an award in June 1968 for the Pacific Northwest Regional Health Sciences Library, which will include Alaska, Idaho, Montana, Oregon and Washington.

Three additional regional medical library applications have been recommended for approval and planning groups are working on the development of programs in all other regions.

PUBLICATIONS AND TRANSLATIONS DIVISION

The Publications and Translations Division administers both a domestic program, in support of nonprofit, secondary publications to assist health professionals in utilizing information important for the national health effort, and an international program, employing special foreign currencies, to foster the international exchange of biomedical information.

Domestic Program

During fiscal year 1968 the publication program continued support of a selective series of significant secondary publications forwarding communication in the health sciences. The oldest of the extramural activities presently funded by the Library, the publication program, is presently conducted under authorizations derived from Section 301 of the Public Health Service Act and Section 399 of the Medical Library Assistance Act.

The program specifically assists publication of such basic information media as handbooks, critical reviews, bibliographies, monographs, abstracts, conference proceedings, atlases, directories, translations and indices.

The publication program substantially broadened the number and disciplinary range of its grants during fiscal year 1968, as well as the types of publications supported. New audiences will be served under the publication grants awarded this year, thus extending the impact of the program on various user groups within the health professions in the United States.

The expansion through a spectrum of 16 health science fields of the type of publication projects supported has resulted in a program which currently includes categorical health areas, as well as broad-scope projects serving health scientists generally. Thus a greater, although still modest, proportion of the total number of publications funded in fiscal year 1968 was in a categorical health area, such as heart disease, dental health and neurology. A slight increase was also apparent in the number of translations supported, particularly those from Soviet literature in such health fields as neurophysiology.

An early project supported in the domestic publication program was a contract to the Association of American Medical Colleges (AAMC) for the publication of a bibliography on medical education based on MEDLARS citations. The third

of three annual bibliographies produced under this contract was published in fiscal year 1968.

This year two new grants were awarded to develop specialized recurring bibliographies in the fields of epidemiology and dermatopathology—also derived exclusively from MEDLARS. These projects were conceived, designed, and will be carried out, in collaboration with the Library, by the national professional organizations representing the health science fields they are seeking to serve. Continuing evaluation has been built into these projects.

Several atlases in fields of high current interest are also being produced with support from the publications program. One is in the field of immunopathology, an area of considerable importance for organ transplantation by surgical techniques. Another atlas is concerned with subhuman primate anatomy. In view of the wide interest in research on species which most closely resemble man, this project should provide valuable information on the structure of such animals, thereby assisting a variety of research studies.

Among the more unusual long-range projects funded, in part, under the publication program, is a long-range study for preparation and publication of a series of monographs on poisonous plants of the world. This project has brought to light a considerable amount of unpublished recorded material on toxic plants indigenous to more remote areas of the world, such as central Africa and the Amazon jungle.

With a shift in emphasis on the mechanism of publication support from contract to grant, the Library has been increasingly able to respond to the needs of health scientists initiating projects to improve the dissemination and use of published scientific information in their respective fields. At the same time the Library has phased out several projects which have been supported under contract for a number of years. Thus, fiscal year 1968 is the last year for support of: (1) the preparation of abstracts of Soviet biomedical literature by Biosciences Information Service, Inc., the publisher of *Biological Abstracts;* and (2) the preparation of Soviet and Japanese abstracts by the Excerpta Medica Foundation. These two contracts made possible the publication of a significant number of abstracts from these two prominent foreign scientific literatures.

Two new study and evaluation contracts were awarded with publication funds at the close of fiscal year 1968. The first is a study of the extent of use, and of potential use, by U.S. health science personnel of biomedical information originally published in a language other than English. The second will evaluate the technical quality of English language versions of ten Polish and three Yugoslav biomedical journals currently being translated and published under the Library's Special Foreign Currency Program.

EXTRAMURAL PROGRAMS

FINANCIAL STATISTICS – FY 1968

PROGRAM	NO. OF AWARDS	AMOUNT
RESEARCH:		
Grants	54*	$ 1,261,000
Contracts	6	212,026
PUBLICATIONS:		
Grants	14	371,813
Contracts	5	210,602
TRAINING	18	922,357
SPECIAL SCIENTIFIC PROJECTS	3	53,958
RESOURCES	373	3,548,001
REGIONAL MEDICAL LIBRARIES	3	680,128
CONSTRUCTION	9	10,000,000
		$17,259,885

*Includes 12 grants administered by Publications & Translations Division

CHART XIV

Among some of the major publications issued in fiscal year 1968 with support from the Library's publication program were the following:

Felter, Jacqueline W. *Union Catalog of Medical Periodicals/I.* New York: The Medical Library Center in New York, 1967. 589 pp.

The Health Sciences Library. Its Role in Education for the Health Professions. Report of the Library Study Committee of the Association of American Medical Colleges to the National Library of Medicine, *The Journal of Medical Education*, 42: No. 8 (August 1967), Part 2, 63 pp.

Kerker, Ann E. and Murphy, Henry T. *Biological and Biomedical Resources Literature.* Lafayette: Purdue University, 1968, 226 pp.

Levine, Norman D. (ed) *Natural Nidality of Diseases and Questions of Parasitology, Proceedings of the IV Conference on the Natural Nidality of Diseases and Questions of Parasitology of Kazakhstan and the Republics of Middle Asia.* Frederick K. Plous, Jr. (translator). Urbana, Illinois: University of Illinois Press, 1968, 483 pp.

Magalhaes, Hulda *A Master Bibliography*, in Hoffman, R. A., Robinson, P. F. and Magalhaes, H. (eds), *The Golden Hamster*, Its Biology and Use in Medical Research. Ames, Iowa: Iowa State University, 1968, 323–542.

Warren, Kenneth S. and Newill, Vaun A. *Schistosomiasis, A Bibliography of the World's Literature from 1852 to 1962.* 2 Vols. Cleveland: Western Reserve University, 1967.

International Program

The Library's wide-ranging international projects, administered under the Special Foreign Currency Program in the Publications and Translations Division, seek to advance communication in the health sciences through mutually cooperative efforts with scientists in other countries. Special foreign currencies, which have been appropriated to the Library since fiscal year 1962, are utilized under authorities of the Public Health Services Act and, specifically, under the 1954 Agricultural Trade Development and Assistance Act as amended, for the support of research and other scientific activities overseas.

Staff additions during fiscal year 1968 facilitated an over-all reassessment and consolidation in the special foreign currency program, as well as the initiation of several new activities overseas. A series of visits carried out in Poland, Yugoslavia, and Israel contributed substantially to the improvement of communication channels, the identification of technical problems, further development of procedures for quality control, and planning for new projects.

The types of collaborative activities currently supported overseas in this program include the preparation of critical, analytic reviews of recent developments in health science fields; research projects in the history of medicine; collaborative programs for the indexing of biomedical literature for use in MEDLARS and *Index Medicus;* the publication of specialized abstracting journals of foreign-language literature; the translation of articles, selected reports, conference proceedings and monographs in the health sciences; cover-to-cover translation and publication of foreign biomedical journals; and, most recently, support of collaborative medical audiovisual demonstration and exchange programs.

Critical Reviews and Histories of Medicine

In fiscal year 1968 four critical reviews in the selected areas of childhood lung diseases, anesthesia for infants, mediastinitis, and the histochemistry of glycogen were initiated in Poland, and the completed manuscripts for two critical reviews, begun in 1966, were submitted to the Library. Six additional critical review proposals were forwarded from Poland for NLM consideration in May 1968.

Critical reviews activated in Israel during fiscal year 1968 included studies on physiological control mechanisms, structure and function in mycoplasma, and the geographic epidemiology of the toxemia of pregnancy. Work continued on the prepara-

tion of an annotated translation from the Arabic of the *History of Physicians*, on a critical edition of Maimonides' Treatise on the *Explanation of Diseases*, while a new historical study on *Assaph the Physician* was activated at the close of the fiscal year. The NLM's overall collaborative agreement with the *Israel Journal of Medical Sciences* in Jerusalem also made possible the publication and distribution in 1968 of the proceedings of the Rehovoth Conference on Health in Developing Areas.

Support for the translation, publication, and distribution of 10 Polish and three Yugoslavian biomedical journals, which the Library has provided during the past 7 years, was continued in those countries under an agreement with the National Science Foundation. These journals cover a wide range of health fields—biochemistry, physiology, pharmacology, immunology, experimental therapy, epidemiology, experimental medicine, microbiology, morphology, radiology, nuclear medicine and biology. The same NLM arrangements made possible the translation and printing in Israel of two serial publications on environmental health for the National Center for Air Pollution Control.

Among the health science monographic studies which the Library translated and published in Israel this year were Stefania Jablonska's *Scleroderma and Pseudo Scleroderma* Warsaw: Panstwowy Zaklad Wydawnictwo Lekarskich, 1965, and B. S. Kuzin (Ed.). *Biology and Control of Dreissena*, Academy of Sciences of the U.S.S.R., Institute of Biology of Inland Waters. Jerusalem: Israel Program for Scientific Translations, 1968.

Through arrangements at the Hadassah School of Dental Medicine, Hebrew University of Jerusalem, the Library continued support for the annual preparation of some 1,200 abstracts from foreign periodicals relating to dental research and oral disease. These abstracts reach a wide audience through publication by the American Dental Association in *Oral Research Abstracts*. Another abstracting project, conducted in the Department of Pharmacology of Hadassah Medical School made possible the preparation of 2,400 abstracts of literature on the use of drugs, for publication in the Food and Drug Administration's *FDA Clinical Experience Abstracts*.

At the close of fiscal year 1968, the Library terminated support for a monthly publication in Israel, *Drug Digest From the Foreign Language Literature*. This pilot project was initiated on an experimental basis in 1964.

The transfer of the National Medical Audiovisual Center to the National Library of Medicine in 1967 opened a significant new area of development in the special foreign currency program. In May 1968 the first collaborative international medical audiovisual project was activated under the Public Law 480 program, through an agreement with the Department of Medical Education at Hadassah Medical School in Jerusalem. This two-year pilot project establishes a biomedical audiovisual demonstration center and exchange program between the National Library of Medicine and the Hadassah Medical School for the advancement of medical science, clinical teaching and continuing education in both countries.

The program will make possible an evaluation of the use of audiovisual methods at all levels of medical education and research, and will be particularly significant in the study of national and regional disease patterns.

The special foreign currency program continues to offer unique resources to the Library, both in direct benefits to the domestic program and for furthering international communication in the health sciences.

MEDICAL LIBRARY RESOURCE GRANT PROGRAM
NEW APPLICATIONS RECEIVED FY 66—68*

TABLE I - GEOGRAPHIC DISTRIBUTION

	FY 66	FY 67	FY 68	TOTAL
ALABAMA	-	3	-	3
ALASKA	-	-	-	-
ARIZONA	-	1	1	2
ARKANSAS	-	2	-	2
CALIFORNIA	1	39	11	51
COLORADO	-	6	3	9
CONNECTICUT	-	5	2	7
DELAWARE	-	1	-	1
DIST OF COLUMBIA	-	5	1	6
FLORIDA	-	8	1	9
GEORGIA	-	4	3	7
HAWAII	-	3	2	5
IDAHO	-	1	-	1
ILLINOIS	-	12	7	19
INDIANA	-	6	1	7
IOWA	-	4	1	5
KANSAS	-	5	1	6
KENTUCKY	-	4	2	6
LOUISIANA	-	4	-	4
MAINE	1	-	1	2
MARYLAND	-	5	2	7
MASSACHUSETTS	-	11	2	13
MICHIGAN	-	14	2	16
MINNESOTA	-	8	-	8
MISSISSIPPI	-	1	1	2
MISSOURI	-	11	1	12
MONTANA	-	3	1	4
NEBRASKA	-	4	2	6
NEVADA	-	-	2	2
NEW HAMPSHIRE	-	3	-	3
NEW JERSEY	-	6	7	13
NEW MEXICO	-	1	1	2
NEW YORK	-	47	11	58
NORTH CAROLINA	-	6	2	8
NORTH DAKOTA	-	2		2
OHIO	-	18	7	25
OKLAHOMA	-	4		4
OREGON	-	3	2	5
PENNSYLVANIA	1	27	13	41
RHODE ISLAND	-	1	2	3
SOUTH CAROLINA	-	2	3	5
SOUTH DAKOTA	-	2	-	2
TENNESSEE	-	4	-	4
TEXAS	-	8	7	15
UTAH	-	1	-	1
VERMONT	-	1	-	1
VIRGINIA	-	3	1	4
WASHINGTON	-	1	1	2
WEST VIRGINIA	-	2	1	3
WISCONSIN	-	5	1	6
WYOMING	-	1	-	1
PUERTO RICO	-	-	1	-
	3	318	110	431*

*Excludes renewal applications

TABLE II - TYPE OF INSTITUTION

	FY 66	FY 67	FY 68	TOTAL
ACADEMIC				
Health Sciences*	-	54	11	65
Dentistry	-	9	7	16
Graduate Sciences	-	1	-	1
Medicine	1	37	2	40
Nursing	-	4	2	6
Optometry	-	5	-	5
Osteopathy	-	3	-	3
Pharmacy		20	6	26
Podiatry	-	1	1	2
Public Health	-	2	-	2
Research Institute	-	-	1	1
Veterinary Medicine	-	8	-	8
Subtotal	1	144	30	175
HOSPITALS	2	146	69	217
RESEARCH INSTITUTES	-	5	4	9
SOCIETIES	-	16	3	19
STATE INSTITUTIONS**	-	6	1	7
OTHER	-	1	3	4
TOTALS	3	318	110	431***

*Excludes renewal applications

**More than one health-related school served by a composite library e.g. one Bio Medical Library at an institution serving Schools of Medicine Dentistry Nursing and Pharmacy

***State Board of Public Health State Department of Public Welfare State Medical Library etc

MEDICAL LIBRARY RESOURCE GRANT PROGRAM
GRANTS AWARDED FY 66-68*

TABLE III – GEOGRAPHIC DISTRIBUTION

	FY 66	FY 67	FY 68	TOTAL
ALABAMA	–	3	–	3
ALASKA	–	–	–	–
ARIZONA	–	1	1	2
ARKANSAS	–	2	–	2
CALIFORNIA	1	32	13	46
COLORADO	–	5	2	7
CONNECTICUT	–	5	1	6
DELAWARE	–	–	1	1
DIST. OF COLUMBIA	–	4	1	5
FLORIDA	–	6	2	8
GEORGIA	–	3	3	6
HAWAII	–	2	3	5
IDAHO	–	1	–	1
ILLINOIS	–	11	6	17
INDIANA	–	5	1	6
IOWA	–	4	1	5
KANSAS	–	5	1	6
KENTUCKY	–	3	2	5
LOUISIANA	–	4	–	4
MAINE	1	–	1	2
MARYLAND	–	4	1	5
MASSACHUSETTS	–	10	2	12
MICHIGAN	–	11	2	13
MINNESOTA	–	6	2	8
MISSISSIPPI	–	1	1	2
MISSOURI	–	8	2	10
MONTANA	–	–	2	2
NEBRASKA	–	3	2	5
NEVADA	–	–	2	2
NEW HAMPSHIRE	–	2	–	2
NEW JERSEY	–	5	8	13
NEW MEXICO	–	1	1	2
NEW YORK	–	36	15	51
NORTH CAROLINA	–	3	3	6
NORTH DAKOTA	–	–	1	1
OHIO	–	13	5	18
OKLAHOMA	–	4	–	4
OREGON	–	3	1	4
PENNSYLVANIA	1	19	14	34
RHODE ISLAND	–	1	2	3
SOUTH CAROLINA	–	2	3	5
SOUTH DAKOTA	–	2	–	2
TENNESSEE	–	4	–	4
TEXAS	–	7	6	13
UTAH	–	1	–	1
VERMONT	–	1	–	1
VIRGINIA	–	2	2	4
WASHINGTON	–	1	1	2
WEST VIRGINIA	–	1	–	1
WISCONSIN	–	5	1	6
WYOMING	–	1	–	1
PUERTO RICO	–	–	1	1
	3	253	119	375*

*Excludes renewals

TABLE IV – TYPE OF INSTITUTION

	FY 66	FY 67	FY 68	TOTAL
ACADEMIC:				
Health Sciences*	–	51	10	61
Dentistry	–	9	7	16
Graduate Sciences	–	1	–	1
Medicine	1	36	1	38
Nursing	–	2	2	4
Optometry	–	4	1	5
Osteopathy	–	3	–	3
Pharmacy	–	18	9	27
Podiatry	–	1	1	2
Public Health	–	2	–	2
Research Institute	–	–	–	–
Veterinary Medicine	–	7	–	7
Subtotal	1	134	31	166
HOSPITALS	2	102	74	178
RESEARCH INSTITUTES	–	3	3	6
SOCIETIES	–	8	7	15
STATE INSTITUTIONS**	–	6	1	7
OTHER	–	–	3	3
TOTALS	3	253	119	375***

*Excludes renewals.

**More than one health related school served by a composite library, e.g., one Bio Medical Library or an institution serving Schools of Medicine, Dentistry, Nursing, and Pharmacy

***State Board of Public Health, State Department of Public Welfare, State Medical Library, etc

CHART XVI

OFFICE OF ASSOCIATE DIRECTOR FOR SPECIALIZED INFORMATION SERVICES

The Library has proceeded with organization and staffing the first phases of Toxicology Information Program development. A program whose potential scope is as great as that envisioned in the original charter for the Toxicology Information Program cannot be implemented without calling upon the full resources of the professional and managerial community in the biomedical sciences.

Toward this end, the general advisory services of the Division of Medical Sciences of the National Academy of Sciences/National Research Council have been pursued, and through them contacts have been made with the total professional community.

The planning staff for the program has developed a set of contracts which are designed to extend NLM capabilities for development of a national system. These contracts, which are identified in this report, are being monitored by staff who are simultaneously occupied with internal planning activities to which the contracts are allied. Such coordination is hoped to assure better utilization of the results of contract effort.

A plan of operation for the Toxicology Information Program was completed and delivered to the Director, NLM. Detailed specifications for early files and products or services dependent upon them are now being developed.

Forward momentum of the planning effort has been maintained in the face of severe restrictions upon staff and budget resources. The following sections will describe some of the activities and accomplishments which have been achieved.

Products and Services

With the signing of a contract on user needs in the field of toxicology, work was initiated to furnish to the program critical information concerning user characteristics, interests and needs. Preliminary interviews were held with professionals to pilot test the use of survey questionnaires and to obtain evaluations of existing products and services containing toxicology information. The survey will continue through July 1969, at which time the contractor will submit final results and recommendations for new products and services to meet varied users' needs.

An agreement with the National Referral Center for Science and Technology, Library of Congress for the development and publication of a *Directory of Sources of Information in Toxicology* led to the selection, analysis and inclusion of approximately 800 potential sources. Copies of this directory should be available for sale by December 1968.

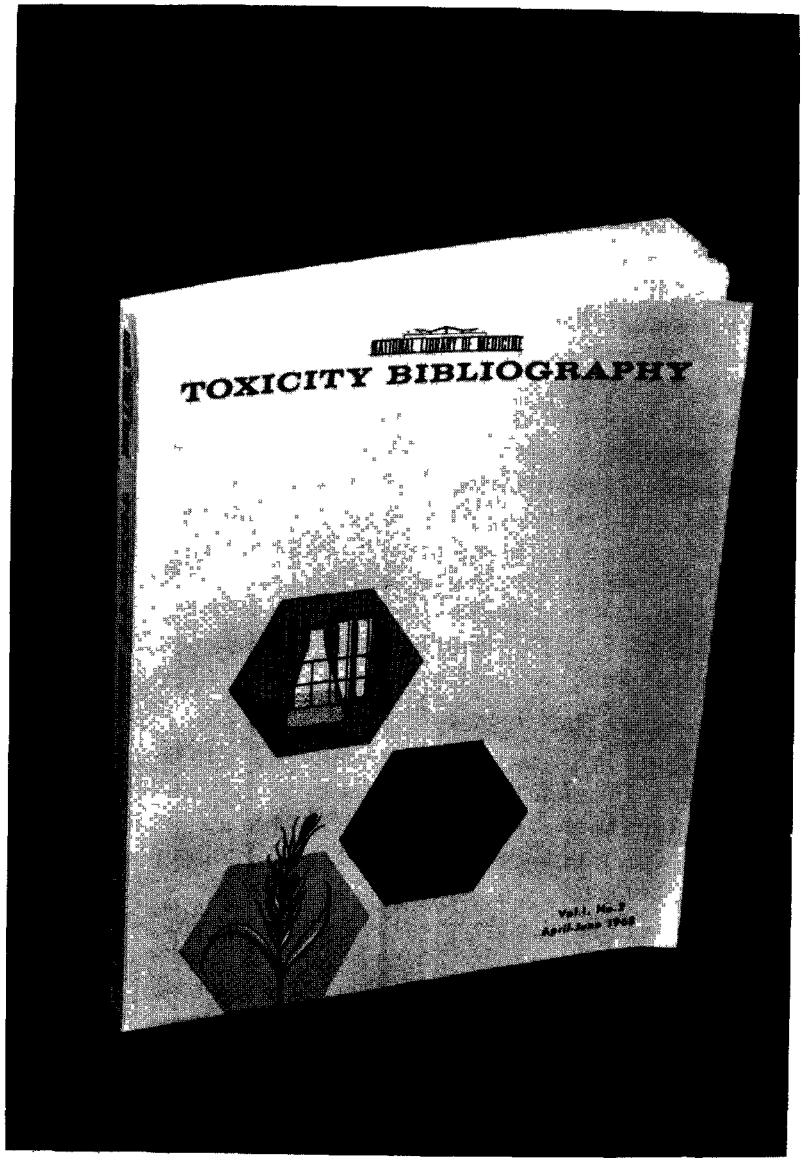
Contractual arrangements were also made for the compilation of a roster of individual authorities on special sub-topics in toxicology who are willing to provide activity assistance to the Toxicology Information Program in a referral capacity. The professional qualifications and the areas of specialization of these authorities will be invaluable in meeting varied demands of the user community.

Requests for specific toxicological information are being received by the program from government agencies and the industrial sector.

Program planning efforts are under way to develop appropriate terminology in the broad field of toxicology. These efforts will be assisted by members of the National Academy of Sciences/National Research Council, Division of Medical Sciences, through a contract for advisory services.

File Organization and Statistics

The development of files of biological information for the Toxicology Program rests on the beginning of a comprehensive file of chemical compounds that can be manipulated and rearranged on the basis of chemical structure. Chemical file information for the Toxicology Information Program will be based initially on the use of the Common Data Base obtained from Chemical Abstract Services. The first addition to the Common Data Base



begun in fiscal year 1968 was the development of Wiswesser Line Notations codes for most of the chemical compounds contained in the Common Data Base. The notation being added to the file should permit rapid sorting of the file elements into structurally meaningful groupings.

The signing of a contract with the Biological Abstracts organization in June marked a beginning for the Toxicology Program of a concerted effort to become more directly involved with the day to day problems of working toxicologists. The creation of files to act as a basis for service to the toxicological community is to be based upon firsthand knowledge of how toxicologists work, what information materials they use, and what services would be most helpful to them.

Drug Literature Program

The first quarterly issue of *Toxicity Bibliography*, for January–March, 1968 was issued in May. A product of MEDLARS, this bibliography results from interaction over the past two years between Drug Literature Program staff and over 100 advisors including toxicologists, pharmacologists, forensic scientists, pharmacists, and other scientists. The consensus from reviewers of the pilot issue was that the bibliography will be very useful to a wide spectrum of toxicologists and other scientists in its present form.

The bibliography was a major accomplishment of the Drug Literature Program and the Toxicology Information Program and represents only one of the projects in which the resources of the two programs have been interwoven to accomplish unified results. Other activities of the Drug Literature Program have continued in the direction of improvement of the Library's resources in the area of drugs, with special emphasis on planning for MEDLARS II, and further interaction with users of drug literature through their professional societies.

Auxiliary Chemical Module

An essentially complete data base for the Auxiliary Chemical

Module was delivered by Chemical Abstracts Service in April. This data base consists of computer tapes describing about 31,000 compounds, with over 100,000 names derived from 40 reference sources and some internal files at the National Library of Medicine, the Food and Drug Administration, and the Chemical Abstracts Service. It had been prepared under a contract for the Food and Drug Administration and the National Library of Medicine.

Starting with this data base, the Auxiliary Chemical Module will consist of supplementary tape files on which references to specific drugs and chemicals not in MeSH will be indexed. In addition, the tape files will enable substitution by the computer of the appropriate MeSH term for author terminology which will be used in indexing the article.

In searches carried out by CAS, each specific chemical in the data base was compared against structures created to define terms for classes of chemicals in MeSH. Work on defining these class terms for searching required extensive and fruitful interaction between CAS and DLP staffs. After receipt of the data base tapes, work has proceeded on reviewing the search results and completion of the computer instructions to map all synonyms to the appropriate MeSH term.

In preparation for using author terminology in indexing, the Bibliographic Services Division cooperated in performing a two-phase test. Six indexers participated, their performance with current indexing methods being compared against that with procedures planned for the Auxiliary Chemical Module.

Vocabulary Improvement

The two advisory panels on terminology each met three times, and preliminary steps were taken to establish a panel for pharmaceutical sciences. It is apparent that scientists must reach agreement on terminology and definitions before best use can be made of their terms in an indexing vocabulary. The Drug Literature Program's advisers in terminology serve also as committees of scientific societies, thus providing channels for communication with practicing scientists. The Advisory Panel on Terminology of Autonomic Drugs created a classification of autonomic drugs which it will publish in *The Pharmacologist*, official bulletin of the American Society for Pharmacology and Experimental Therapeutics. The classification will be used for reorganization of the categorized lists and establishment of new terms in MeSH.

The Advisory Panel on Toxicology Terminology, which reports also to the American Society for Pharmacology and Experimental Therapeutics and the Society of Toxicology, redefined several subheadings, reviewed work on the *Toxicity Bibliography*, and made extensive recommendations for new terms in MeSH related to environmental health and hazards. As a result of discussions with the Executive Committee of the Academy of Pharmaceutical Sciences, that organization appointed a Committee on Information. It is anticipated that they will recommend a subcommittee to function as an advisory panel to the Library on terminology of the pharmaceutical sciences. Two of the Specialized Information Services staff were active members of the HEW Task Force on Prescription Drugs, Subcommittee on Drug Classification.

Professional Relationships

In addition to its work with terminology advisers, the Drug Literature Program carried out several activities to orient potential users to the Library's services and to obtain information on ways in which the Drug Literature Program could help them in the future.

The Drug Literature Program sponsored a 3-day MEDLARS Appreciation Course in November in cooperation with the American Society of Hospital Pharmacists, Dr. Anthony Harley of the United Kingdom MEDLARS Center, and staff of the Bibliographic Services Division. This was attended by 21 invited hospital pharmacists who evaluated the program as very useful. The Drug Literature Program also monitored an exhibit at the Clinical Mid-year meeting of the ASHP.

All of the pharmacy residents in the Public Health Service visited the Library during their tour of duty in Washington, and received presentations on the Library and the Drug Literature Program.

Two associates from the Pharmaceutical Manufacturers Association completed training in indexing and search work, and one continued to work at the Library within the Drug Literature Program, assisting in the development of the Auxiliary Chemical Module.

One of the Library Associates for 1966–1967 spent the last several months of her traineeship in the Drug Literature Program.

OFFICE OF ASSOCIATE DIRECTOR FOR AUDIOVISUAL TELECOMMUNICATIONS DIRECTOR NATIONAL MEDICAL AUDIOVISUAL CENTER

Fiscal year 1968 was a year of transition for the Center with its transfer from the National Communicable Disease Center (NCDC) and elevation to a major component of the National Library of Medicine.

In spite of the numerous reorganizations in both DHEW and PHS, and a reduction in funds available for travel and contracting, program activity continued to expand. Reduction in reimbursable work for NCDC was offset by an increase in requests for audiovisual services from other programs in the Public Health Service. However, efficient and economic planning and utilization of personnel, particularly in the production activity, could not be accomplished when approximately 22 percent of the funding was dependent on reimbursable contracts received in the last half of the fiscal year.

A significant physical reassignment within the limited space allocated to the Center by NCDC was made in the last few months. Six new sound-proof film editing rooms were constructed by the NMAC staff. The technical maintenance shop was also restructured and relocated. Finally, after more than a year's delay, due to circumstances beyond the control of NMAC, eight new offices for the Motion Picture Directors and Writers Staff were completed.

A major problem still exists at the Chamblee Annex which houses the entire film distribution, film depository and reference activities. This modified wooden warehouse has been declared a definite fire hazard facility. Action has been initiated with the local GSA Real Estate Division to study other rental buildings in the general area.

A major reorganization study of NMAC was undertaken during fiscal year 1968. Its objective was to develop the most effective organization framework for maximum utilization of existing resources. The new organization as approved by the Directors of NIH and NLM, was effective July 1, 1968 (Chart XVII). By this reorganization, six sections were consolidated into three branches or key programs, and 24 operational units were merged into 11 sections. Direction, control and supervision of the Center's programs have been considerably strengthened by this action.

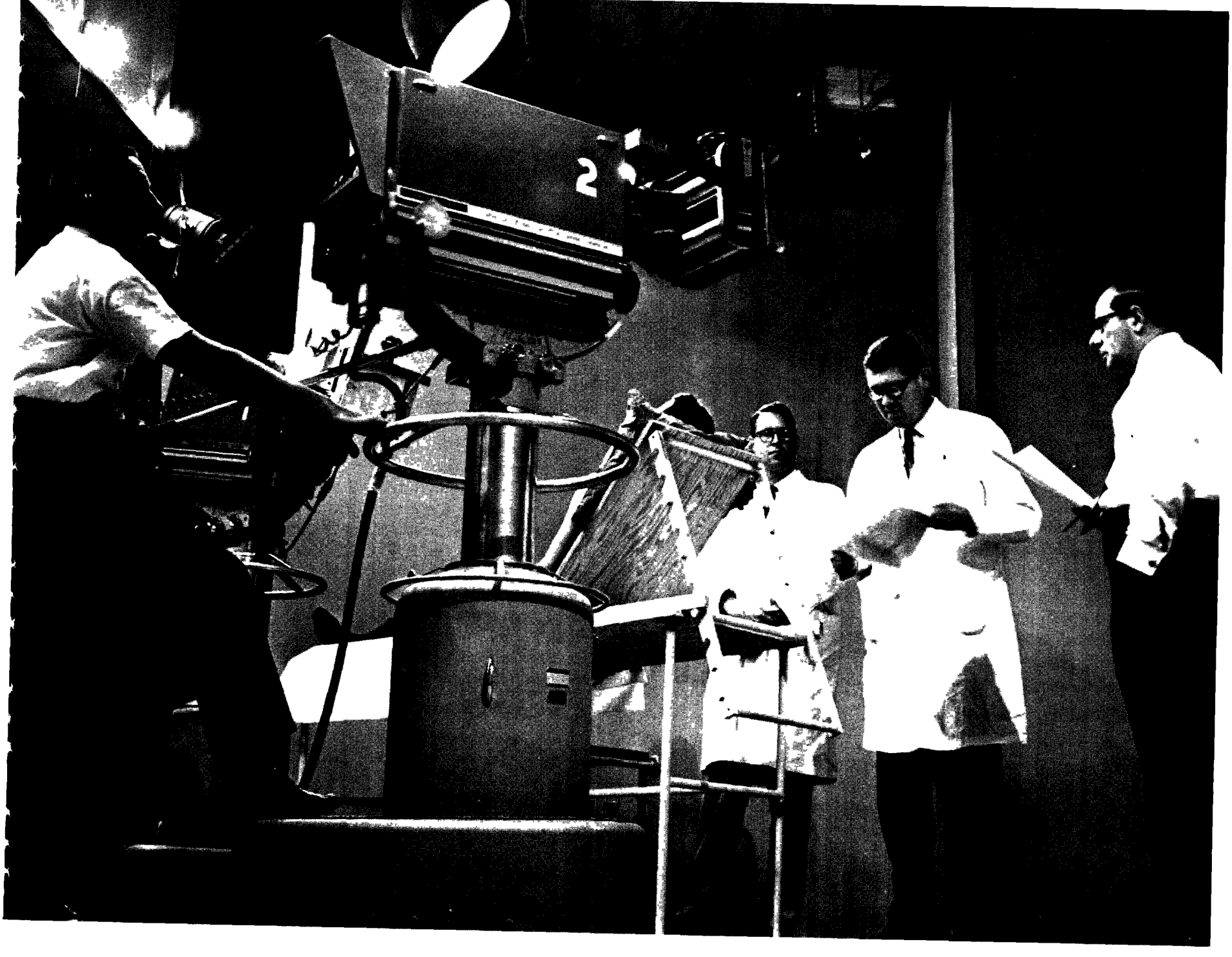
A feasibility study on facility requirements for 1973 was completed by the architectural firm of O'Connor and Kilham which recommends the ultimate relocation of NMAC to a new center building on the campus in Bethesda.

The NLM Board of Regents held part of their March 1968 meeting in Atlanta. The outgrowth of this meeting, plus recommendations of several Task Force teams reemphasized the priority to be given in all of NMAC's programs to the medical and health professional communities on a national basis.

The National Medical Audiovisual Center and the Better Bellevue Association co-sponsored a conference (May 16, 1968) to explore the current status of research and development in medical teaching techniques. The Director of NMAC served as co-chairman of the conference with Dr. Jacobus Potter, Associate Dean, New York University School of Medicine. The purpose of the conference was to explore the challenge of the three problems threatening the future of American medical research and patient care: manpower deficiencies; deficiences in the continuing education of health professionals; and deficiencies in public health education.

Administrative Management

Available operating funds expended in fiscal year 1968 amounted to approximately $2,253,000 (Chart XVIII). Of this amount, $351,825 was transferred to the National Communicable Disease Center under the support agreement leaving $1,902,000 for the



Center's operations. This is $219,000 less than the $2,121,000 utilized by this Center for direct operations in the previous year.

The total productive output indicates that 48 percent ($1,081,483) was expended in support of production; 15.5 percent ($346,501) for acquisition, distribution, cataloging and reference activities; 5.5 percent ($123,331) for systems planning and educational studies and development; and the remaining 31 percent ($701,458) for program administrative support including $351,825 for NCDC support, and special projects such as Community Medical Television System (CMTS).

Fiscal year 1968 ended with a total of 142 personnel on the NMAC payroll (127 permanent, 15 temporary) (Chart XIX). The 15 temporary personnel were: 3 fulltime temporary employees, 1 90-day appointee, 7 summer hires and 4 Youth Opportunity Corps personnel. The 142 employees were distributed as follows: 47 percent in direct production operations, 26 percent in acquisition, distribution, cataloging and reference activities, 9 percent in systems planning and educational studies and development, and 18 percent in program management, administrative support and special projects.

This compares with fiscal year 1967 when a total of 141 personnel were on board (134 permanent, 7 temporary). Approximately 50 percent were then involved in direct production operations, 20 percent in acquisition, distribution, cataloging and reference activities, 10 percent in systems planning and educational studies and development, and 20 percent in program management, administrative support and special projects.

Motion Picture and Television

Motion picture and television production for fiscal year 1968 fell short of preliminary estimates in all categories and failed to equal the peak record achieved during the previous year. Decreases in production were influenced by several factors principal of which were organizational separation of NMAC from NCDC (resulting in decreased demand for audiovisual services from NCDC), a general cutback in requests from other Federal agencies, and several reorganizations within HEW and the Public Health Service.

The number of motion pictures completed in fiscal year 1968 totaled 101 (Chart XX). These pictures included 25 foreign adaptations, 1 film produced initially in a foreign language, and 5 television spot announcements. Sixty-three of the total films produced were designed for principal distribution in 8 mm. format.

Thirty-eight television programs were completed in fiscal year 1968 (Chart XXI). Of these, 23 were completed in the studio and 15 completed by the Community Medical Television System. Approximately one-half of the television programs completed are or will be available for distribution either in the form of duplicate video tapes or television film recordings (kinescopes) or both.

Forty motion picture and film scripts were prepared for NMAC productions by staff and contract writers. Four additional scripts were cancelled after initiation, and four more are in progress. During fiscal year 1968, the motion picture and television activity produced original films and video tapes for or in cooperation with the following agencies and institutions: Rehabilitation Services Administration, National Center for Air Pollution Control, National Institute for Neurological Diseases and Blindness, Division of Radiological Health, Division of Health Mobilization, National Center for Urban and Industrial Health, National Center for Chronic Disease Control, and the National Communicable Disease Center.

Significant Productions

The Price of Survival—25 minute, 16 mm., sound, color film produced for the Division of Health Mobilization. The film is designed to be projected in three parts, with discussion periods after each segment. The first part presents a simulated disaster, a tornado, and the inadequacy of the affected city in dealing

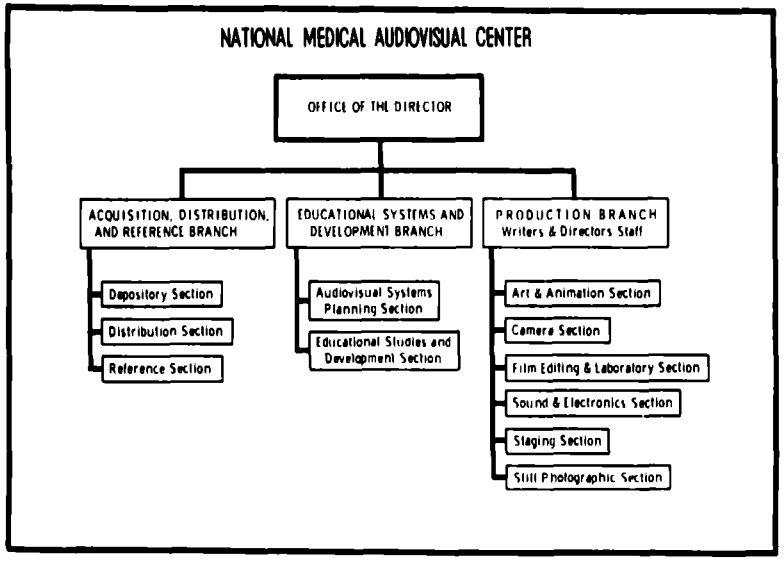


CHART XVII

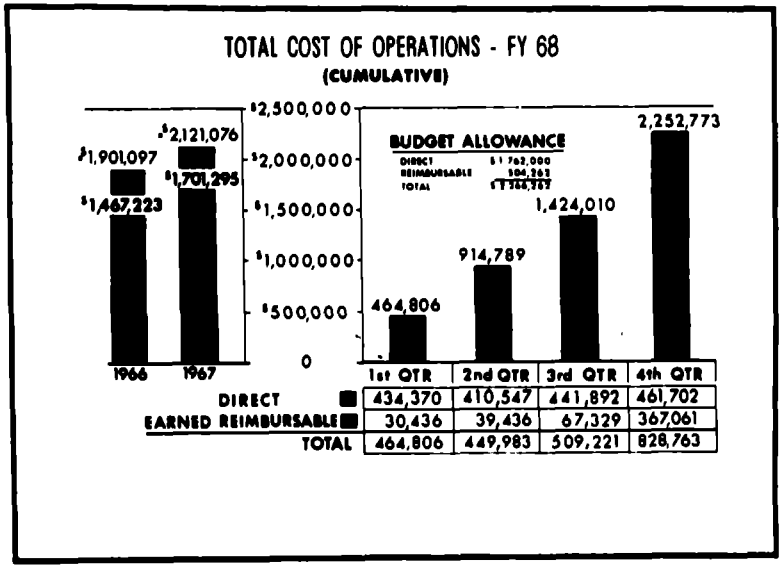


CHART XVIII

with its aftermath. The second part shows this city planning and preparing for future emergencies. Part III covers a realistic "emergency" drill, a key step in preparation for disaster.

Fluorescent Antibody Detection of Enteropathogenic Escherichia Coli—14 minutes, 16 mm., sound, color film produced for the Laboratory Program of NCDC. Demonstrates a method of detecting E. Coli in infants within one hour. The film encourages hospital directors to make this procedure a routine test on all infants admitted, since E. Coli is often responsible for severe outbreaks of infantile diarrhea.

Television in Biomedical Communications—15 minute, black and white videotape recording, transferred to 16 mm. film for distribution. An introduction, in nontechnical terms, to the manifold uses of television as an aid to teaching in schools of the health professions. The film is best presented by someone qualified to discuss the potentials of television for specific applications.

Five Days of Internal Medicine—A video tape documentation of the highlights of a 5-day seminar on internal medicine held at Grady Memorial Hospital in Atlanta, September 25–29, 1967. The tapes will serve as source material for future tape duplicates and film transfers.

Bone Marrow Aspiration—7½ minute, 16 mm., sound, color film. Demonstrates the technique of taking bone marrow specimens from the sternum, and the preparation of smears for staining. For professional audiences only, primarily pathologists.

Community Action in Agua Prieta—20 minute, 16mm., sound, color film produced for the Training Program of NCDC. Documents the health and sanitation program that was carried out in the small Mexican border town of Agua Prieta as a demonstration project. Produced, initially, with Spanish narration tract.

Cleaner Cars for Cleaner Air—10 minute, 16 mm., sound, color film, produced for the National Center for Air Pollution Con-

trol. Presents briefly the significance of air pollution from automobiles to the nation's health and economy. Depicts the operation of an emission-testing laboratory to measure the effectiveness of emission-control devices on cars.

Blood Pressure Readings—18½ minute, 16 mm., sound, color film. This test film for medical students shows a manometer with accompanying, synchronous Korotoff sounds. Fourteen patients' blood pressures are presented, each followed by a pause for the observer to write his interpretation of the reading.

NMAC designed and produced for the Rehabilitation Services Administration a training "package" to instruct vocational rehabilitation counselors in the rehabilitation of clients with heart disease. The training materials include motion pictures, a filmstrip, a student manual, and a teacher's guide. The following four motion pictures were produced under this program:

A Second Chance for Charlie—22 minute, 16 mm., color film. This motivational picture is a screenplay about the successful rehabilitation of a milkman who has suffered a coronary attack. It shows the coordinated efforts of a counselor, a work evaluation unit, and the client's physician.

Edward Bailey—Cardiac—10 minute, 16 mm., sound, color film. One of the three "open-end" films that present an unresolved problem as a platform for class discussion. Here, a client's physician has advised him against returning to his job. The vocational counselor tries to persuade the physician that the client be tested by a work evaluation unit.

John Hazen—Cardiac—8 minute, 16 mm., sound, color film. Shows the case of a cardiac client who has been told by his physician that he cannot return to work. The Social Security Administration cardiologist rules that he is able to work. When the vocational counselor attempts to mediate, the physician flatly refuses to cooperate.

David Carney—Cardiac—8 minute, 16 mm., sound, color film. In this case history, a heart patient seeks the aid of a woman counselor to regain his job as shop foreman in an industrial plant. The counselor visits the personnel manager who argues that cardiacs are a bad risk, and that rehiring them is "against company policy."

Four television "spots" for the Office of Pesticides, NCDC, were completed. They will be distributed to television stations across the nation for use in public-service broadcasts.

Accident—60 second, 16 mm., sound, color film. Alerts farm workers to the dangers of using concentrated pesticides.

Children—20 second, 16 mm., sound, color film. Cautions parents to keep pesticides locked and out of reach of children.

Insects—20 second, 16 mm., sound, color film. Warns the public that pesticides spilled on the skin can be lethal.

Skull and Bones—20 second, 16 mm., sound, color film. Presents steps to be taken in cases of accidental pesticide poisoning.

Production began on a long-term series of video tapes in the broad area of Clinical Pathology. They will be used in medical schools and for continuing education of physicians. Ultimately, there may be as many as 100 titles in the series.

The following five tapes have been completed to date:

Theories of Blood Coagulation—28 minute, black and white, video tape. Dr. Harold Roberts explains the mechanism of blood coagulation, with a brief resume of recent experimental work in this field. Reference is made to the existing knowledge of pathogenesis of hemorrhagic and thrombo-embolic disease entities.

The Hemophilioid Disorders, Clinical Manifestations and Methods of Diagnosis—45 minute, black and white, video tape. Dr. Harold Roberts discusses in detail the factors involved in hereditary bleeder states. Covers clotting, common synonyms, and associated hemorrhagic disorders, with emphasis on clinical patterns.

Treatment of Hemophilioid Disorders—32 minute, black and white, video tape. Dr. Harold Roberts discusses the hemophilias and other blood dyscrasias, and the treatment for each type and phase of hemophilia. Emphasis is on Factor VIII fractions and plasma concentrates.

Diffuse Intravascular Coagulation—30 minute, black and white, video tape. Dr. Harold Roberts explains the complex syndrome of intravascular coagulation, and the interrelationship of clotting proteins and IVC. Acquired bleeding tendencies are also covered.

The Fibrinolytic Mechanism and Test of Fibrinolytic Function—Dr. Harold Roberts discusses the role of fibrinolysis in physiology and disease. Normal factors are presented first, followed by disease states.

Awards

Two motion pictures produced by NMAC were awarded top honors in national-international competition. *Spot Prevention*, a 13½ minute, color, animated cartoon film on measles immunization was granted three awards: Premier Award, Atlanta International Film Festival; Industrial Film Award, Industrial Photography Magazine; and the Oxberry Animation Award, presented each year for the best use of animation in an industrial film. *The Price of Survival*, a 25 minute, color film designed to promote community preparation for disaster, received a Bronze Plaque from the National Committee on Films for Safety, and A Festival Honor Certificate at the Education Film Library Association American Film Festival.

Graphic and Photographic Arts

Eighteen new filmstrips and slide series were completed during fiscal year 1968 (Chart XXII). This is far short of the goal set at the beginning of the year. Reorganization and funding limitations, previously mentioned, were the causes of this reduction.

The filmstrip *How to Complete a Certificate of Live Birth* was produced for the National Center for Health Statistics. Release prints will be distributed during the first quarter of fiscal year 1969. Near completion are the two Rehabilitation Services Administration heart filmstrips, *Heart of the Matter* and *The Work Evaluation Unit*. Both are due for early fiscal year 1969 completion and distribution. The three-part filmstrip package

entitled *Human Reproduction* and the slide series and filmstrip production *Peripheral Nerve Injuries* are in the shooting phase of production and will also become new fiscal year 1969 NMAC releases. Ten filmstrips, 500 release prints each, were completed for the Pan American Sanitary Bureau. A reorder of 7,500 filmstrip kits, 11 lessons each, entitled *Medical Self-Help Training* is in production for the Division of Health Mobilization.

Photographic activity in support of NCDC is on the decline. This circumstance is created by that Center's efforts to develop its own photographic capability. Presently, NMAC is doing mostly the copy work and photomicrography which NCDC cannot yet handle (Chart XXIII).

Support Production Services

Support services reflected an increase in several areas during the last half of the fiscal year (Chart XXIV). This is indicative of the dependency placed on reimbursable services for these activities. This was particularly true in the duplication of 2 x 2 slides and filmstrip release prints. With the gradual withdrawal of the need for these services by NCDC, considerable resource potential is now available to expand in all of these areas.

Cataloging and Special Reference

The International Index of Medical Film Data, the centralized descriptive and source information bank on audiovisuals dealing with medical and health related sciences, has received increased emphasis and developmental attention. This collection presently contains information on over 26,000 pertinent audiovisuals. During the latter part of the fiscal year, a contract was executed to place the entire collection into a compatible source data format, which will in turn allow easy management of information by subject cross-indexed reference. Over 3,000 additional citations were made this past year, as well as over 6,000 changes to update information. During this fiscal year, revised editions of the *National Medical Audiovisual Center Catalog* and *Film Reference Guide for Medicine and Allied Sciences* have again been compiled and completed. The catalogs are now at the Government Printing Office for publication and are expected to be available for sale through the Government Printing Office in late July 1968.

Two specialty catalogs were also produced; one, in the field of Mental Retardation, the other on the subject of Heart Disease, Cancer, and Stroke.

Increased emphasis was placed on the compilation of selected listings of audiovisuals in specific subject areas. The first three that were compiled, published and distributed covered the areas of Drug Addiction, The History of Medicine, and Dentistry. Two additional selected listings dealing with subject areas of Nurse Training and Mental Health are now awaiting publication. Other selected listings, now in preparation, are on such diverse subjects as family planning, gynecology, and tobacco addiction.

Preliminary discussions were begun with NLM/Library Operations staff to develop guidelines for integration of appropriate NMAC/NLM activities and to consider ways of providing regular citation input from this activity for inclusion in appropriate NLM publications. A request has also been made to the Library Operations staff to provide basic orientation and training to NMAC staff in the use and application of the MeSH System.

Acquisition, Retention, and Distribution

The audiovisual distribution program continued its accelerated rate. The 92,713 loans executed during the year represent a 27 percent increase over fiscal year 1967 (Chart XXV). Of the total audiovisual loans, approximately 70 percent were directed to medical and health related professional institutions and individuals.

During this past fiscal year, a complete systems study was performed for the distribution operation and a proposed applications specification for an Automated Audiovisual Distribution

System was developed and furnished to NMAC by the National Archives and Record Service of the General Services Administration. It is anticipated the system will be implemented, tested, and placed into initial operation by fiscal year 1970.

Fifty new titles have been added to the audiovisual distribution collection. One of the major sources of new acquisitions has been the sponsorship of audiovisuals in distribution by concerned elements of the Department of Health, Education, and Welfare. It was estimated that well over half of our yearly audiovisual loan experience is accounted for by subjects that have been placed with NMAC for distribution by such agencies. During this same period, over 4,500 requests for loans had to be turned down because of the insufficiency of distribution copies of many of NMAC titles. A program is now under way to replenish the stock levels of distribution copies for those subjects which have been in great demand.

The still picture collection, consisting of over 100,000 separate items of art work, transparencies, slides and other still photographic forms, has reflected a 50 percent increase (from 8,468 to 12,056) in demand searches over fiscal year 1967.

New input into this collection has been reduced materially as a result of NCDC's establishment of their own still photographic capability and facility. Action is now being taken to develop alternate sources of input which will enlarge and increase the subject scope of the collection.

The National Archives of Medical Motion Pictures has continued to be refined and developed as a unique archival information resource. During this period 90 new acquisitions were accepted to this collection which now brings the total number of subjects to 1,500 in the collection. In addition to this, an active acquisition program has been pursued on an individual title basis, as well as efforts to establish major acquisition input sources through discussions with the Library of Congress and other sources. During the year about 500 titles were reviewed and made ready for cataloging and indexing. Plans are now

underway to establish the necessary operational and policy guidelines for the future conduct and development of this activity.

Educational Studies and Development

VA Site Surveys

One of the major activities during fiscal year 1968 was a joint project conducted by the Audiovisual Sytems Planning Section and the Educational Studies and Development Section at the request of the Veterans Administration. This project included sending teams of two staff members to each of the ten remote nonaffiliated Veterans Administration hospitals to identify existing needs for audiovisuals and their potential utilization for continuing education. Considerable data was collected from hospital administrators, chiefs of the various services, and professional staff. A formal report is now being prepared, analyzing the findings, drawing conclusions, and making recommendations for strengthening continuing education programs at those hospitals which are remote from major medical centers.

Graduate Program in Biomedical Communication

The first group of Students in the Graduate Program in Biomedical Communication—including one M.D., one D.V.M., two D.D.S.'s, two nurses, one FDA officer, and one professional medical writer—have completed their courses of study at participating colleges and organizations and are now working on their project theses.

Degrees will be conferred at Tulane University in August 1968. NMAC's portion of the program, Communication Tools in Action, was conducted from January 2—March 15, 1968, and consisted of 30 instruction sessions utilizing more than 35 members of NMAC's staff. An evaluation form was completed by the students after each session. Initial analysis and unsolicited verbal commentary indicate that NMAC's portion of the program was considered to be interesting and perhaps the most productive for the students.

Consultation, Conferences, Workshops

The staff provided consultation and assistance in the most effective use of audiovisual aids and resources on 101 occasions to 162 individuals representing 18 schools of medicine, 3 schools of dentistry, 6 schools of veterinary medicine, 6 schools of nursing, 14 hospitals, and other health-related organizations. Of these, 19 individuals were from the following foreign countries: Canada, England, Scotland, Denmark, Chile, Colombia, Venezuela, and West Pakistan.

During the fiscal year, 16 teaching presentations were made which included: Fourth Annual Faculty Retreat—University of California School of Dentistry, San Francisco Medical Center, Asilomar, Calif., September 15–16, 1967; Seminar—University of Miami School of Medicine, Miami, Fla., October 10–11, 1967; Symposium on Education in Veterinary Public Health and Preventive Medicine—Pan American Health Organization, St. Paul, Minn., March 20–22, 1968; Sixteenth Annual Clinical Meeting—The American College of Obstetricians and Gynecologists, Chicago, Ill., May 4–9, 1968; Telelecture for Harvard University School of Public Health, presented from NMAC, March 14, 1968.

Fourteen conferences and workshops were conducted at the Center and extramurally, to encourage the production, dissemination, and utilization of medical films and other audiovisuals in schools of the health professions and elsewhere. Included were:

National Audiovisual Conference and Workshop—The American College of Obstetricians and Gynecologists, Atlanta, Ga., December 4–7, 1967; and Workshop for American Association of Medical Record Librarians, Atlanta, Ga., March 18–20, 1968. Preliminary evaluation was made of the programmed instruction text and slide set on *Oral Cancer: Detection and Diagnosis* which was produced and distributed to dentists in the State of Kentucky during fiscal year 1967. The kit has been in consider-

able demand. Final evaluation will be made after January 1, 1969, when additional data will be available.

Review of Grant Proposals

During fiscal year 1968, eight grant proposals were reviewed which covered the use of biomedical audiovisual communication resources in Regional Medical Programs, Clinical Teaching, Nursing, Dermatology, physically handicapped and the development of prototype medical education units of hematology, neurology, and the cardio-vascular system.

Audiovisual Systems Planning

The loss of two key professional personnel in the first half of fiscal year 1968 necessitated a curtailment of site surveys by the Audiovisual Systems Planning activity. As a result, only 20 formal site surveys were made during the year. This represented nine schools of medicine, one school of nursing, one school of public health, one school of veterinary medicine and eight hospitals and health-related institutions. Nine site surveys were postponed or cancelled.

Direct consultative services were extended on 61 occasions with 35 sets of blueprints analyzed. Seven conceptual designs of classrooms and audiovisual departments were prepared for institutions engaged in building programs.

A number of resources bibliographies have been compiled. Bibliographies of books and periodicals on *Facilities Design for the New Media*, *Instructional Materials Centers*, *Computer Assisted Instruction*, *Directors of Audiovisual Communications*, and *Universities Offering Graduate Work in Audiovisual Education* have been completed.

Audiovisual Advisory Services

The combined efforts of the Center's staff in assisting individuals and institutions through consultations, formal surveys, seminars, workshops and presentations resulted in a 20 per cent increase in this program over fiscal year 1967 (Chart XXVI).

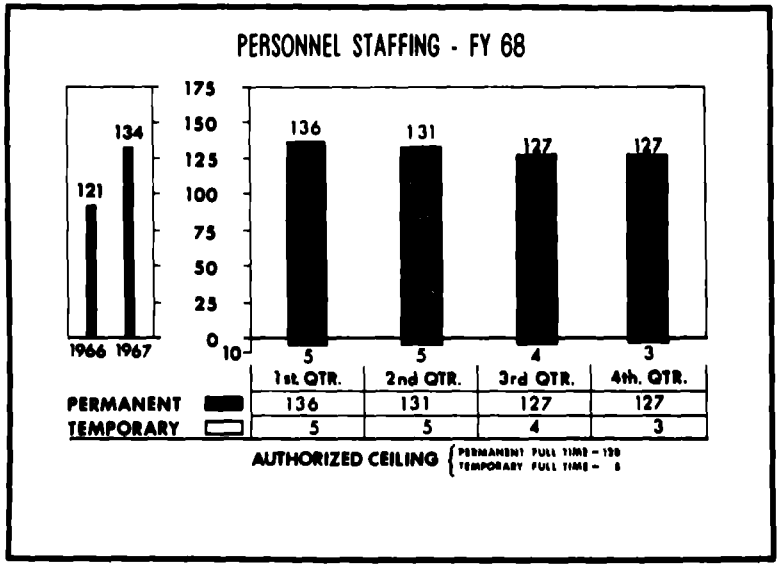


CHART XIX

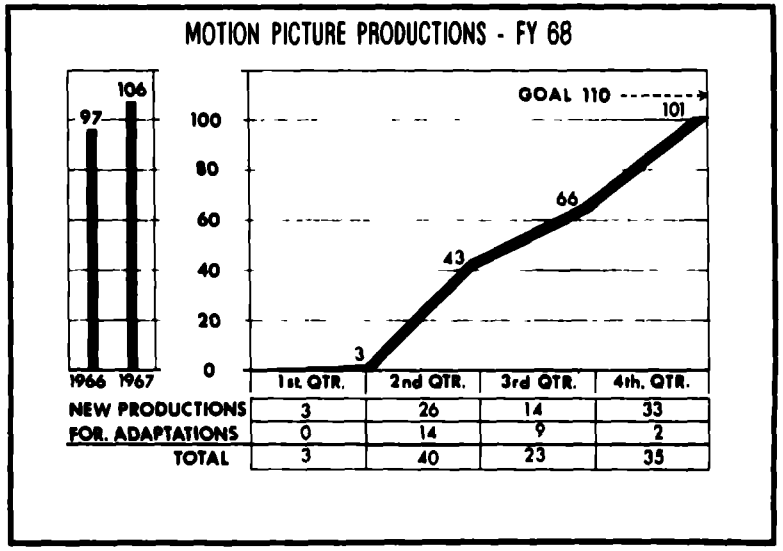
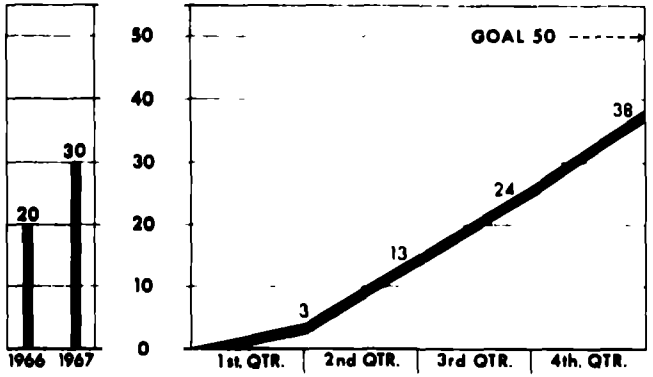


CHART XX

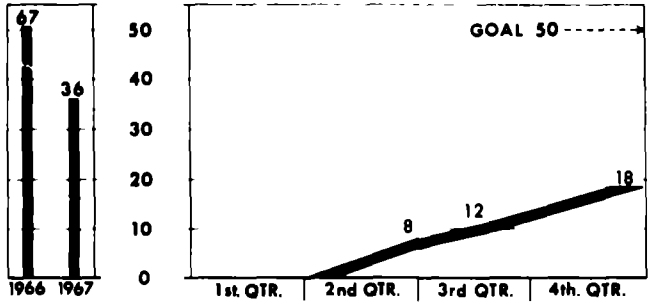
TELEVISION PRODUCTION - FY 68



	1st. QTR.	2nd QTR.	3rd QTR.	4th. QTR.
STUDIO TV PRODUCTIONS	2	5	8	8
CMTS TV PRODUCTIONS	1	5	3	6

CHART XXI

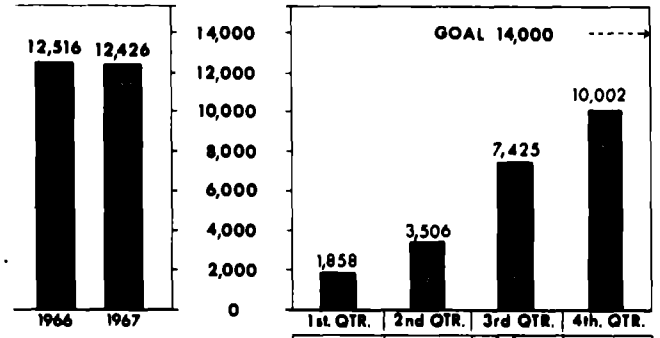
FILMSTRIPS & SLIDE SERIES - FY 68



	1st. QTR.	2nd QTR.	3rd QTR.	4th. QTR.
NEW PRODUCTIONS	0	8	4	6
FOREIGN ADAPTS.	0	0	0	0
REVISIONS	0	0	0	0
TOTAL	0	8	4	6

CHART XXII

PHOTOMICROGRAPHS - FY 68
(CUMULATIVE)



	1st. QTR.	2nd QTR.	3rd QTR.	4th. QTR.
PHOTOMICROGRAPHY PRODUCED	1,858	1,648	3,919	2,577

CHART XXIII

SUPPORT PRODUCTION - FY 68

	1st. QTR.	2nd. QTR.	3rd. QTR.	4th. QTR.
MOTION PIC. REL. PRINTS PROD.	2,101	1,955	1,513	2,370
DUPLICATE AUDIOTAPES	835	331	1,036	289
STILL PICTURE PHOTO. WORK				
ORIGINAL PHOTOGRAPHY	4,941	6,172	6,389	6,842
PHOTOGRAPHIC PRINTS	8,470	7,953	6,601	6,218
DUPLICATE SLIDES	35,455	16,279	25,848	75,617
FILMSTRIP RELEASE PRINTS	0	1,487	2,258	85,477
UNITS OF ART WORK	2,654	1,158	4,499	2,239

CHART XXIV

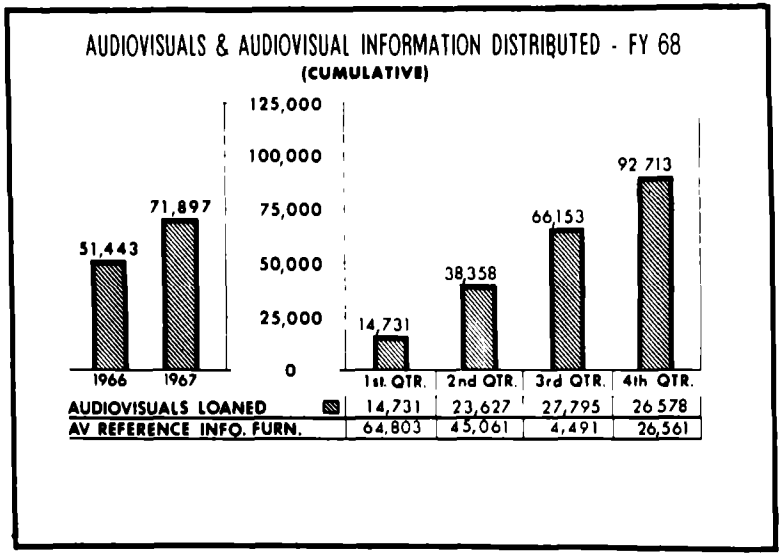


CHART XXV

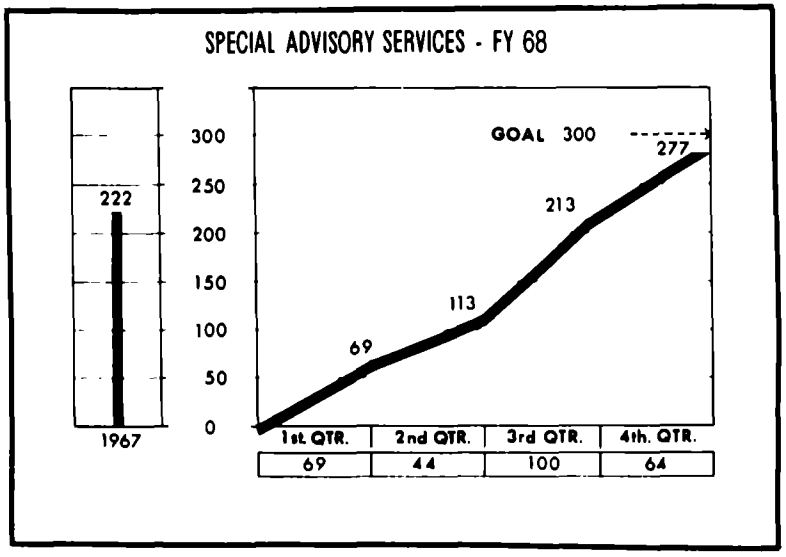


CHART XXVI

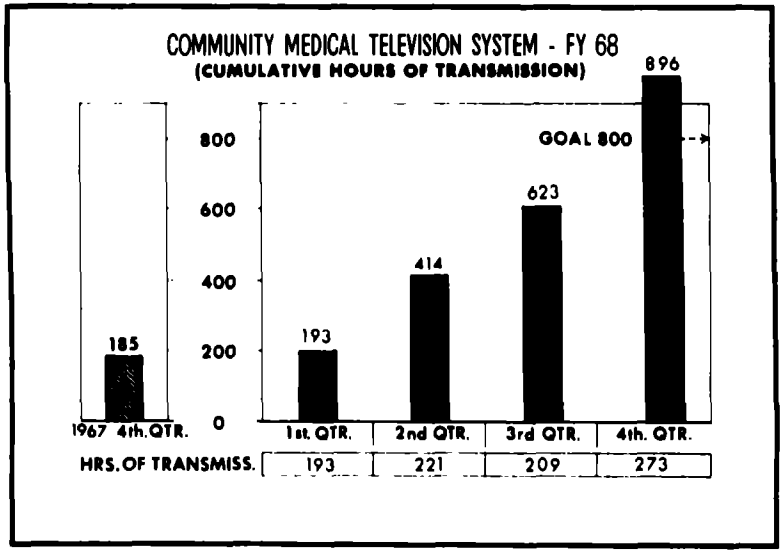


CHART XXVII

Primary program responsibility for these services was assigned to the Educational Studies and Development Section and the Audiovisual Systems Planning Section.

Publications

The number of publications produced was considerably below the planned objectives for this program. Curtailment of funding and personnel limitations had its affect on these activities.

Several significant publications were prepared for use with audiovisuals: *Vocational Rehabilitation of Stroke Clients—Student Manual; Vocational Rehabilitation of Stroke Clients—Instructor Guide; Vocational Rehabilitation of Heart Clients—Student Manual; Vocational Rehabilitation of Heart—Instructor Guide; Vocational Rehabilitation of Cancer Clients—Student Manual; Vocational Rehabilitation of Cancer Clients—*

Instructor Guide; Psychological Aspects of Disability—Student Manual.

Writing, editing, and graphic services were completed and coordination with the printer was provided for the 186-page illustrated volume *Assistive Devices for the Handicapped.* In addition, the final draft of the publication *Training Mentally Retarded Children in Feeding Skills and Toilet Use: Discussion Guide* was written. It will be prepared for printing during the next fiscal year.

Community Medical Television System

In 1967 a significant prototype closed circuit television system—CMTS (Community Medical Television System) was planned and supported by NMAC for the metropolitan area of Atlanta with the cooperation of approximately 12 public and private hospitals.

To date the CMTS has transmitted a total of 896 hours through the System which was comprised of 295 live-only air hours, 170 live and simultaneously taped air hours, 336 tape playback hours, and 95 identification and program promotion hours of transmission (Chart XXVII).

A number of conferences are being televised weekly on a repetitive basis. Typical of these are the Peripheral Vascular Conference; Pediatric Surgery Conference; Coronary Case Nursing; Combined X-ray, GI Surgical Conference; Clinical Pathology Conference; Basic Science Lecture Series; Surgical Staff Conference; GYN–OB Conference; Cardiology Conference; Pediatric Grand Rounds; and Medical Grand Rounds.

APPENDIX

MEDLARS Products

as of June 30, 1968

1. *Index Medicus* (Monthly)
2. *Cumulated Index Medicus* (Annually)
3. *Bibliography of Medical Reviews* (Monthly—Annually)
4. *List of Journals Indexed in Index Medicus* (Annually)
5. *Medical Subject Headings* (Annually—three interim issues)
6. *NLM Current Catalog* (Bi-weekly—Cumulative Quarterly)
7. *Anesthesiology Bibliography* (Bi-monthly)
   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 Blindness, National Institutes of Health
10. *Index to Dental Literature* (Cumulative Quarterly)
    Cooperating Organization: American Dental Association
11. *Endocrinology Index* (Bi-monthly)
    Cooperating Organization: National Institute of Arthritis and Metabolic Diseases, National Institutes of Health
12. *Fibrinolysis, Thrombolysis & Blood Clotting* (Monthly—Annually)
    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—Annually)
    Cooperating Organization: Journal of Medical Education
15. *Index of Rheumatology* (Monthly)
    Cooperating Organization: American Rheumatism Association
16. *Bibliography of Surgery of the Hand* (*Quarterly*—Annually)
    Cooperating Organization: American Society for Surgery of the Hand
17. *Toxicity Bibliography* (Quarterly)
    Cooperating Organization: Drug Literature Program, National Library of Medicine

U.S. GOVERNMENT PRINTING OFFICE: 1969 O—331-725

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