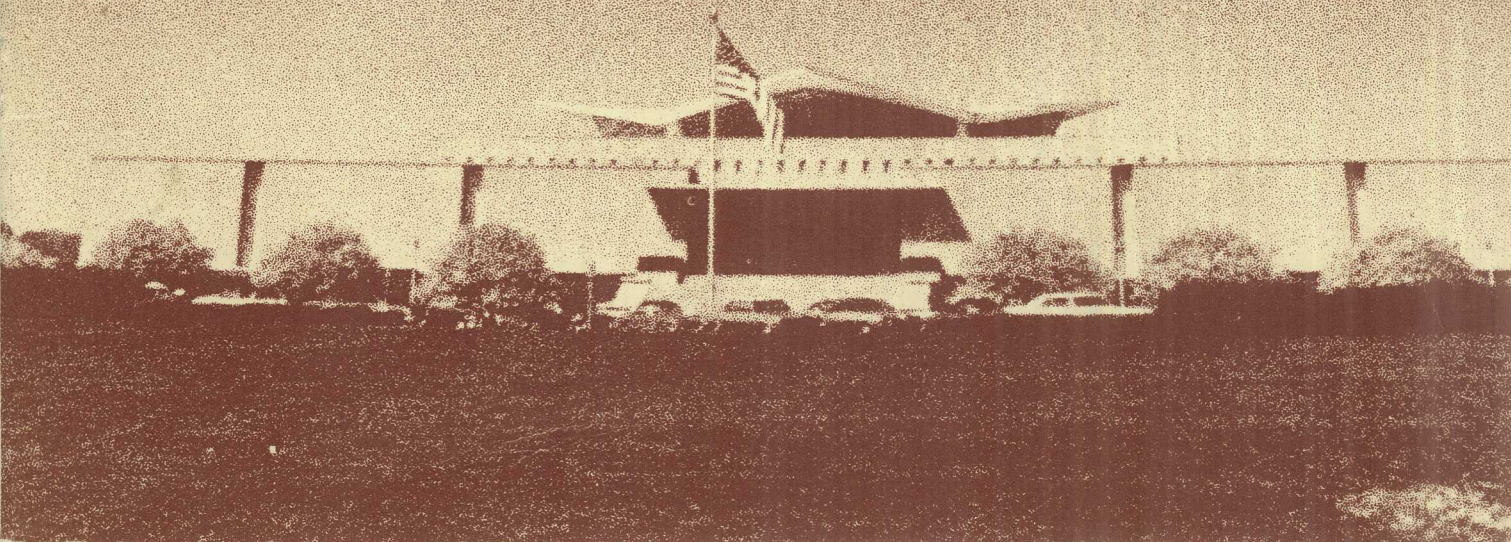


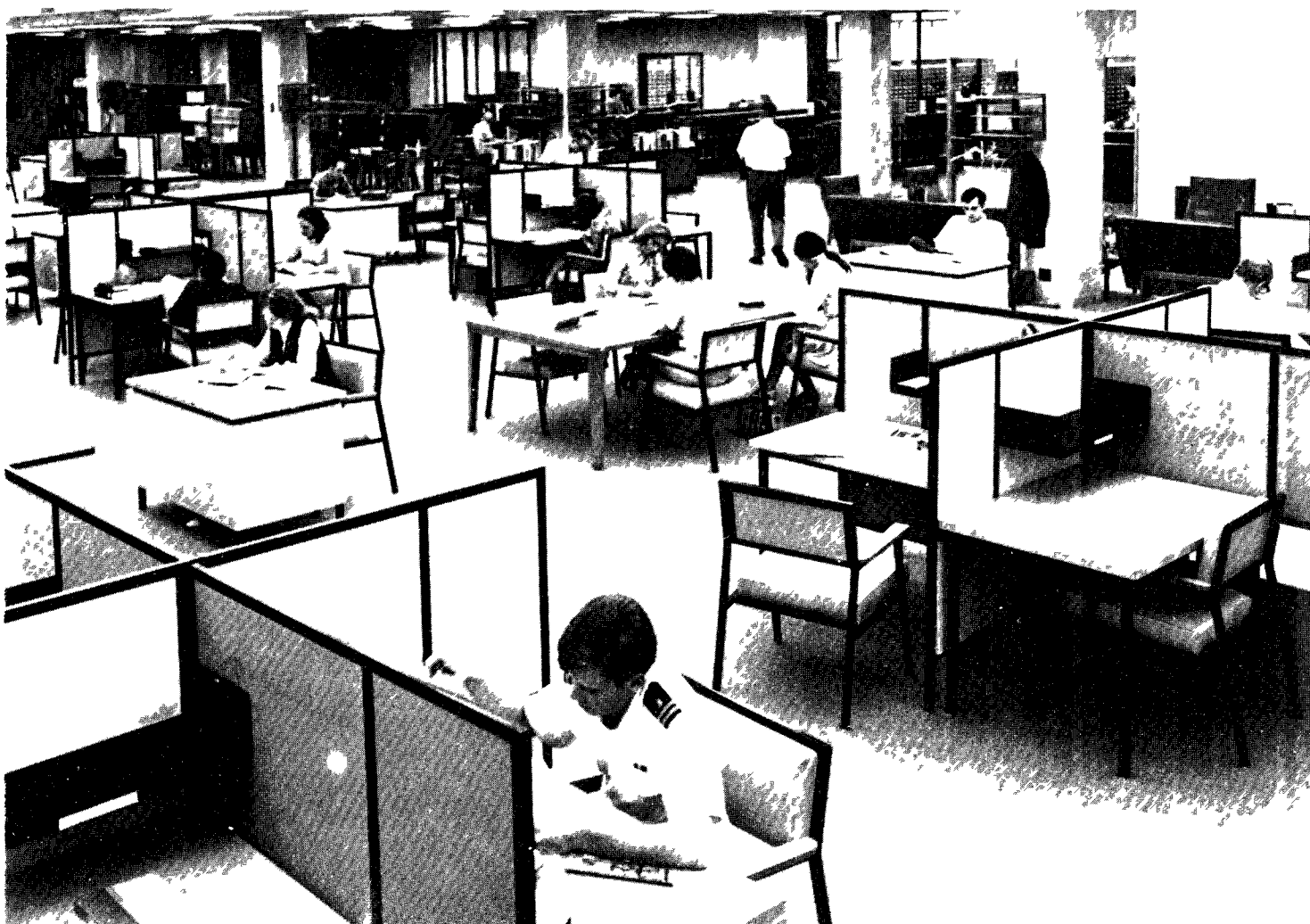
**THE
NATIONAL LIBRARY
OF
MEDICINE**

**PROGRAMS AND SERVICES
FISCAL YEAR 1973**



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**U.S. Department of Health, Education, and Welfare
Public Health Service
National Institutes of Health**

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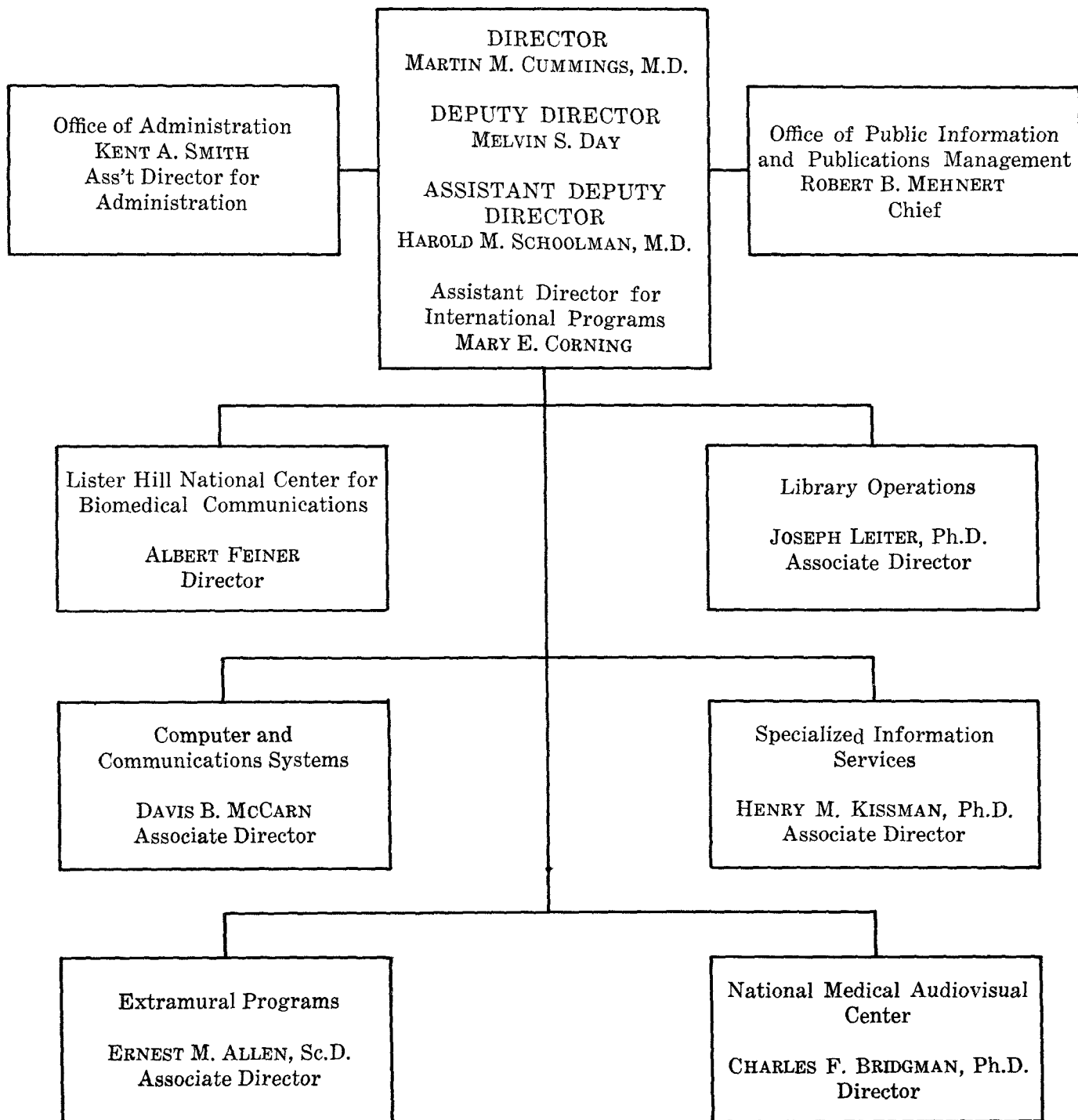
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ORGANIZATION OF NATIONAL LIBRARY OF MEDICINE



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I. POLICY AND DIRECTION

Board of Regents

On December 1, 1972, HEW Secretary Elliot L. Richardson announced the appointment of William N. Hubbard, Jr., M.D., to a second term as a member of the National Library of Medicine's Board of Regents. Dr. Hubbard, Vice President of the Upjohn Company, was first appointed to the Board in 1963, and was elected Chairman twice, in 1965 and 1966. At the June 1973 meeting of the Board, John P. McGovern, M.D., was elected Chairman to replace retiring Chairman Jack M. Layton, M.D. Also attending their last meeting in June were William O. Baker, Ph.D., and ex officio member Lt. General Hal B. Jennings, Jr., who is retiring from the U.S. Army. At the end of the fiscal year there were six appointed Regents, four less than the ten authorized by the National Library of Medicine Act of 1956.

Because of the Library's expanding activity in developing on-line bibliographic retrieval services, the Board of Regents approved a policy statement governing the provision of such services, including program objec-

tives, operational model, and specific responsibilities. Other Board policy actions taken during fiscal year 1973 included approval of:

- Guidelines for interaction between the Biomedical Library Review Committee and Regional Medical Library directors.
- A policy of not supporting publication of cumulative indexes of a single journal title that is already under bibliographic control.
- A policy that library reclassification projects should not be supported.
- Revised guidelines and procedures for grant review recommended by the Extramural Programs Subcommittee of the Board.

Staffing Activities

Melvin S. Day was appointed the Library's Deputy Director, succeeding Dr. G. Burroughs Mider, who retired from Federal service in June 1973. Mr. Day came to NLM in October 1972 from the National Science Foundation, where, as Head of the Office of Science Information Service, he was respon-



Members of the Board of Regents pose at March 1973 meeting in Tucson, from left, front row: Drs. William O. Baker, Jack M. Layton, Mrs. Bernice M. Hetzner, Drs. Susan Y. Crawford, Faye G. Abdellah, John P. McGovern. Back row: Rear Adm. Edward J. Rupnik, USN, Brig. Gen. George E. Reynolds, USAF, Dr. J. Stanley Marshall, Lt. Gen. Hal B. Jennings, USA, Drs. John W. Mehl, Angelo M. May, William N. Hubbard, and NLM Director Martin M. Cummings.

sible for planning and executing the Foundation's program in science information interchange among scientists both within the U.S. and abroad.

Ernest M. Allen, Sc.D., was named Associate Director for Extramural Programs; his appointment became effective March 1, 1973. Dr. Allen, who succeeded Leroy L. Langley, Ph.D., had served since January 1970 as Deputy Assistant Secretary for Grant Administration Policy, Department of Health, Education, and Welfare. Arthur Broering was appointed Deputy Associate Director for Extramural Programs.

Harold M. Schoolman, M.D., Special Assistant to the NLM Director for Medical Program Development, was named Assistant Deputy Director. In this role he has primary responsibility for coordinating the activities of both the National Medical Audiovisual Center and the Lister Hill Center. At the same time Kent Smith, the NLM Executive Officer, was appointed Assistant Director for Administration, and the office he heads designated the Office of Administration. His office has responsibility for personnel management, finance, program analysis, contracts, and administrative management services.

Other staff changes:

Seymour I. Taine, formerly Chief of the

National Institutes of Health Library, was named Chief of NLM's Technical Services Division.

Carol Spencer was appointed Deputy Chief of the Reference Services Division. Miss Spencer had previously served as Director of Regional Services for the Library of The College of Physicians of Philadelphia.

Harry D. Bennett, former Vice President of VIP Systems, Inc., was appointed Deputy Associate Director for Computer and Communications Systems.

B. Earl Henderson, former staff engineer with Magnavox Research Laboratories, was named Chief, Network Engineering, Communication, and Operations Branch, Lister Hill National Center for Biomedical Communications.

The Library continues to operate within tight personnel restrictions. In FY 1973 there was a full-time permanent employment ceiling of 466 positions, three less than the previous year (Table 1). With large reductions in personnel anticipated in FY 1974, the Library's ability to respond to requests for service will be a serious problem. In FY 1973, there were 363 employees in the Library in Bethesda, while 103 were at the National Medical Audiovisual Center in Atlanta, Georgia.

Table 1. Personnel Ceilings

	FY 1972	FY 1973	FY 1974*
Office of the Director -----	12	12	11
Office of Public Information and Publications Management -----	5	6	5
Office of Administration -----	37	36	34
Office of Computer and Communications Systems -----	55	54	51
Extramural Programs -----	31	30	27
Lister Hill National Center for Biomedical Communications -----	15	17	16
Specialized Information Services -----	17	16	14
National Medical Audiovisual Center -----	105	103	98
Library Operations -----	192	192	190
TOTAL	469	466	446

* Estimated

Federal Appropriations

In January 1973, the President submitted to Congress the Administration's fiscal year 1974 budget. The amount requested for the National Institutes of Health totaled approximately \$2.0 billion, representing a decrease of approximately \$50 million from 1973. Within the proposed NIH budget, the Library's request was for \$25 million, the same as its 1973 level of funding (Table 2). The 1974 budget estimate, however, calls for a reduction of 20 positions.

NLM productivity and the efficiencies associated with innovative technology have continued to increase, although such gains are being offset by a rise in the demand for

service. Successful service prompts greater demand and, on the basis of 1973 experience, the NLM continues to encounter serious problems in meeting its service obligations. This situation will become more critical with the lower personnel levels reflected in the 1974 budget. Service demands have increased in part because: (1) the overwhelming response of the health community to the recently introduced MEDLINE system has greatly increased the demand for access to the biomedical literature; and (2) the increased cost of literature acquisition has forced some hospital and clinical libraries to reduce medical journal subscriptions, thereby increasing the demands upon NLM and the Regional Medical Libraries.

**Table 2. Financial Resources and Allocations
Fiscal Year 1973**

Amounts Available for Obligation	
Appropriation, NLM	\$24,994,000
Plus: Unobligated balance brought forward, start of FY 1973	54,808
Pay cost supplements	156,000
Earned reimbursements	962,000
Less: Unobligated balance carried forward, end of FY 1973	-27,000
Total	<u>\$26,139,000</u>
Amounts Obligated by Extramural Programs	
Training grants	\$ 721,000
Special scientific project grants	76,000
Research grants	665,000
Library resources grants	2,615,000
Regional medical library grants	2,179,808
Publications support grants	393,000
Subtotal, grants	<u>\$ 6,649,808</u>
Amounts Obligated for Direct Operations	
Lister Hill National Center for Biomedical Communications	\$ 1,949,000
National Medical Audiovisual Center	3,453,000
Office of Computer and Communication Systems	3,240,000
Library Operations	5,222,000
Toxicology Information Program	1,533,000
Review and Approval of Grants	757,000
Program Direction	3,326,000
Subtotal, direct operations	<u>\$19,380,000</u>
Total Obligations, NLM	<u>\$26,029,808</u>

Although the President's FY 1974 budget does not increase the level of funding for the Library, it proposes some redistribution of funds into Library Operations and the Regional Medical Library Program to help defray the increased costs of providing services. With reduced manpower and level funding, the Library will place even greater emphasis on applying the latest technology to the problems of information transfer and on streamlining and improving the Regional Medical Library Network.

Copyright Suit

The copyright suit (*Williams & Wilkins v. the United States*) is pending final adjudication by the Court of Claims. The agencies specified in the complaint, which was filed in February 1968, are the National Library of Medicine and the staff library of the National Institutes of Health.

On February 16, 1972, a commissioner of the United States Court of Claims filed a report recommending in favor of the plaintiff, stating that the National Library of Medicine infringed the publisher's copyright by providing interlibrary loans of single photocopies of journal articles to medical libraries for the use of physicians, scientists, and students in biomedical fields, and that NIH infringed the plaintiff's copyright by supplying photocopies of medical journal articles to its staff. This photocopying, the report stated, diminishes the publisher's potential market, and the plaintiff is, therefore, entitled to compensation.

Shortly after the commissioner filed his report, Williams & Wilkins established a plan calling for an increase in the journal subscription rate to institutions, which would include an automatic license to make unlimited single-copy reproductions of all articles, current and past, in journals that they published. In addition, the plan called for a five-cents-per-page fee for interlibrary loan reproduction. Reaction to the publisher's proposal by libraries and educational institutions was generally adverse. NLM refused to renew its subscriptions under these conditions; the Library was willing to pay the

higher institutional rates, but not as a license or royalty for photocopying.

On October 2, 1972, Williams & Wilkins issued an open letter stating that they had accepted the NIH-NLM position. The publisher stated, "Our new institutional rates, which we shall continue to request, shall have no connection whatever with a license to photocopy, implied or otherwise. . . . Libraries may continue to supply their users with royalty-free, single-copy reproductions of W&W journal articles. . . . We are [also] without prejudice withdrawing our proposal for the five-cents-per-page interlibrary loan fee until the appeal of our case has been heard." The National Library of Medicine and the NIH Library have agreed to this proposal. These libraries will pay the increased institutional subscription rates, with the understanding that this does not include a license to photocopy, and will continue to reproduce Williams & Wilkins journal articles for interlibrary loan without payment of any royalty.

Lister Hill Center Building

The Philadelphia architectural firm of Carroll, Grisdale and Van Alen, is scheduled to complete by June 1974 the final working drawings for construction of the Lister Hill National Center for Biomedical Communications. The structure, to be adjacent to the present Library building, will feature a ten-story tower and three underground levels, and will contain approximately 200,000 gross square feet of space. The facility will house the staff of the Lister Hill Center, the National Medical Audiovisual Center now in Atlanta, the Extramural Programs, the Specialized Information Services, and the Office of Computer and Communications Systems.

The Senate Joint Resolution that created the Lister Hill National Center for Biomedical Communications in 1968 called for the construction of a facility in which innovative approaches for medical communication networks would be developed. In FY 1970, the Congress appropriated planning

funds for this facility and later in FY 1972 \$765,000 was apportioned by the Office of Management and Budget for this effort. On November 9, 1972 the General Services Administration negotiated the contract with Carroll, Gridsdale and Van Alen to design the building.

Awards and Honors

The American Medical Writers Association elected Director Martin M. Cummings, M.D., an honorary fellow. The certificate of election was presented "in recognition of high qualifications, personal and professional, in medical communication" at the Association's meeting in Dallas, Texas, September 23, 1972.

Henry M. Kissman, Ph.D., Associate Director for Specialized Information Services, received the Superior Services Award of the Department of Health, Education, and Welfare. Dr. Kissman was cited for his "extraordinary ability in supervising the assimilation and organization of significant toxicological resources into effective information retrieval services for the scientific community."

Manfred J. Wasserman of the History of Medicine Division was presented the 1973 NLM Regents Award for Scholarship or Technical Achievement at the Board's June meeting. He was cited for his "initiative and accomplishments in historical research utilizing unique material in the National Library of Medicine's manuscript collection."

Visitors to the Library

Each year hundreds of scholars, scientists, students, librarians, and government officials from all over the world visit the National Library of Medicine. They come to discuss special areas of interest with staff members, see demonstrations of the new bibliographic retrieval services being developed at the Library, and tour the facility. There were more than 1,350 such visitors in FY 1973. This number, of course, does not include the many patrons of the Library who spend days, and in some cases, weeks, of continuous study and research.



Boris V. Petrovsky, Minister of Health, USSR (left) and Nikolai N. Blokhin, Director of the Moscow Institute of Experimental and Clinical Oncology (right), discuss NLM programs with Director Martin M. Cummings through interpreter.

The touring visitors receive a general orientation to the Library, including a brief description of its history and development, and are taken through the reading and catalog rooms, MEDLARS computer area, and the interlibrary loan and photocopying services.

Exhibits

Three new exhibits were displayed in the Library's entrance foyer during the fiscal year. The first honored the achievements of Louis Pasteur on the occasion of the 150th anniversary of his birth; the second, "The Evolution of the American Medical Periodical," traced the history of the American medical journal from its beginnings in 1794; and the third, "Medicine of the Civil War," paid tribute to the dedicated medical personnel of the War Between the States through a display of medical artifacts, photographs, and drawings, as well as printed works from the Library's collection.

Equal Employment Opportunity Activities

In March 1971, Library management and employees participated in an Equal Employment Opportunity Conference in Harpers Ferry, West Virginia. As a direct result of this meeting a comprehensive plan for advancing equal employment opportunity

(EEO) was developed. An Affirmative Action Plan was completed and distributed to all employees early in FY 1973. Certain significant achievements have resulted:

- an administrative trainee position was created;
- 17 employees from the Public Services Careers Program were placed within NLM;
- three Project Stride candidates are being effectively utilized in the Library;
- promotions and quality increases for minorities and women significantly advanced

with 60 percent of the FY 1973 promotions going to minorities and 70 percent going to females;

- the National Medical Audiovisual Center established and elected an EEO Committee to serve its own complex in Atlanta;
- the NLM EEO Coordinator established a system of periodic meetings with the Associate Directors to improve communications and, where possible, resolve problems;
- an Annual EEO Award Ceremony was initiated in FY 1973 with six employees being recognized for their contributions to EEO.

II. SERVICES AND OPERATIONS

What are usually thought of as the Library's "traditional" services are becoming less traditional with each passing year. The application of modern information-handling techniques to bibliographic services is a development John Shaw Billings, the Library's director in 1880, would have understood. It was in that year he suggested that cards with punched holes be used in the Tenth U.S. Census to record data about individuals, and that a machine do the work of tabulating. Almost 100 years later the Library is utilizing computers, the descendants of this tabulating machine, and developing new methods of bringing bibliographic services to health professionals around the world.

Thus, during the past year, the Library continued to develop and extend bibliographic supportive services for the Regional Medical Library Network. The initiation of Phase II of MEDLINE network development placed particular emphasis on extending MEDLINE services to large community hospitals and clinical centers concentrating on direct patient care and health-related educational and research efforts. This extension of the MEDLINE network to hospital libraries will stimulate the sharing of available resources to insure adequate bibliographic backup services for the network participants. To increase bibliographic self-sufficiency in community hospitals, Regional Medical Libraries are developing core lists of journal titles so that hospital libraries and other community-based health-care institutions will share in the responsibility for network bibliographic services.

In addition to participating in the Cataloging in Publication Program of the Library of Congress, begun last year, NLM has again joined with the Library of Congress and the National Agricultural Library in a national effort for positive bibliographic identification of newly acquired serials—the National Serials Data Program.

The Library conducted workshops and

seminars to train information specialists in NLM indexing methods and in how to operate MEDLINE terminals and search the on-line data bases. The one-year library associate training program continued to prove popular with recent graduates of library science schools. There were 57 applications from graduates of 32 schools for the three positions beginning in September 1973. The training program consists of a curriculum of formal presentations, practical experience, and project assignments.



NLM Associates, 1972/73. From left: Nancy Stiles, Lillian Kozuma, Gary Byrd, Susan Kirkbride, Becky Lyon.

Bibliographic Services

Approximately 207,000 articles were indexed for MEDLARS under the management of the Bibliographic Services Division during FY 1973. Because indexing was on a current basis throughout the year, the indexing load was less than in previous years, when backlogs were being absorbed. Indexing completed under contracts and through bilateral international arrangements accounted for 83 percent of the total production, with all review and revision to assure quality control being performed by the Library staff. The computerized file of citations to the medical literature grew to 1.8 million. The list of journals indexed was intensively reviewed

during the year; it has been possible to add additional valuable literature to the list as a result of deletions and increased available indexing capacity.

The Medical Subject Headings Section placed particular emphasis on drugs and chemicals. A major effort was devoted to reorganizing and expanding the hierarchical structure of the vocabulary, in anticipation of new computer system capabilities which will come with MEDLARS II.

Technical Services

In January 1973, the Technical Services Division began sending bibliographic data

on all newly acquired serials to the National Serials Data Program in The Library of Congress for assignment of International Standard Serial Numbers (ISSN). These numbers will be used to develop an internationally accepted system for serial control and positive bibliographic identification. The U.S. domestic program is jointly sponsored by the three U.S. national libraries—the Library of Congress, the National Agricultural Library, and the National Library of Medicine. The handling of new serial titles on an on-going basis is considered to be of prime importance to assure the success of the program.

Table 3. Growth of Collections, FY 1973

	Volumes Added	Total Volumes in Collections
Book Material		
Bound Monographs		
Prior to 1800 -----	539	39,237
1801-1913 -----	359	89,950
1914-present -----	9,370	257,959
Bound issues -----	23,200	418,412
Unbound issues (volumes) -----	655	45,948
Theses -----	6,150	340,260
Pamphlets -----	27	171,928
Total Book Material -----	40,300	1,363,694
Non-Book Material		
Microfilms (archival) -----	1,121	13,294
Microfiche -----	1,117	5,387
Pictures -----	1,100	69,438
Total Non-book Material -----	3,338	88,119
Total Book and Non-book Material -----	43,638	1,451,813

Table 4. Summary of Acquisition Statistics

	FY 1971	FY 1972	FY 1973
Serial Record			
New titles added -----	1,534	1,172	741
Discontinued titles -----	337	201	86
Current titles received -----	22,161	23,132	23,787
Publications Processed			
Serial pieces -----	97,816	87,995	100,930
Other -----	25,499	20,323	20,548
Total -----	123,315	108,318	121,478
Obligations for Publications			
Included for rare books -----	\$57,945	\$79,583	\$118,133
	\$370,438	\$430,000	\$575,000

Table 5. Summary of Cataloging Activities

	FY 1971	FY 1972	FY 1973
Completed Cataloging -----	16,795	13,595	13,161
Catalog Cards Filed -----	114,786	105,236	112,716
Volumes Shelf-listed -----	10,996	8,549	9,494

The Cataloging in Publication Program, begun in FY 1972, has resulted in the cataloging of approximately 1,000 medical titles during its first year of operation; this figure should double in FY 1974. At present, more than 30 major medical publishers are actively supplying prepublication data to NLM through the Library of Congress. The cataloging information generated at NLM is then sent back to the publisher to be printed in the publication. With the availability of cataloging data for this volume of English language materials, the cost of cataloging for medical libraries should be substantially reduced.

Table 6. Binding Statistics

	FY 1971	FY 1972	FY 1973
Number of Volumes			
Sent to binder -----	16,807	20,619	32,362
Bound at NLM -----	5,623	6,627	2,462
Repaired at NLM --	3,150	3,323	1,392

A contract was awarded and completed during the year which provided for the binding of approximately 14,000 serial titles. A

similar, more extensive program is planned for FY 1974.

Reference Services

The demand for reference services continued the upward trend of the preceding years (Table 7). The decline in the number of NLM on-site users is related to the increase of medical library resources in the local area.

As a result of a study of reference monographs and journals the Library has updated this collection and identified areas of weakness in both the reference and general collections. An on-line serial control system for the journal collection in the Reading Room, which could serve as a model for the entire collection, is under consideration.

The distribution of Literature Searches, printed bibliographies on a wide variety of biomedical subjects, increased from 34,000 to over 49,000 in 1973. During the year, a new service made these bibliographies available on a "standing order" basis to approximately 100 major medical libraries throughout the country.

Table 7. Summary of Reference Services

	FY1971	FY 1972	FY 1973
Requests by Telephone -----	10,027	11,505	11,803
Government -----	4,653	4,922	4,507
Non-Government -----	5,374	6,583	7,296
Requests by Mail -----	1,391	1,570	1,229
Government -----	133	104	63
Non-Government -----	1,258	1,466	1,166
Readers Assisted -----	8,868	9,347	11,107
Government -----	3,219	3,393	3,207
Non-Government -----	5,649	5,954	7,900
Total -----	20,286	22,422	24,139
Government -----	8,005	8,419	7,777
Non-Government -----	12,281	14,003	16,362
Reading Room Users Registered -----	22,382	20,350	16,938

Table 8. Summary of Circulation Activities

	FY1971	FY 1972	FY 1973
Number of Requests			
Received -----	218,982	241,824	256,715
Filled -----	186,144	193,009	194,341
For readers -----	83,585	72,892	70,430
By interlibrary loan -----	102,559	120,117	123,911
Photocopy -----	95,559	110,081	114,228
Original -----	7,000	10,036	9,683
Unfilled -----	32,838	48,815	62,374
Rejected and Referred -----	9,273	10,558	12,228
Unavailable -----	23,565	38,257	50,146

Interlibrary loan requests received at NLM hit a new high in FY 1973. The increase was concentrated in requests for journal articles (Table 8). This increased demand, coupled with a large staff turnover and no increase in manpower, resulted in a reduction in the fulfillment rate. However, improvements in the Loan and Stack Section did speed up loan service, including a more rapid "nonavailable" response.

In the fall of 1972 the Reference Services Division supplied data for serial titles held by NLM to the National Serials Data Program in the Library of Congress. An aperture card format proposed by NLM was accepted as the standard for the Program. Microfilm surrogates composed of the title pages and mastheads of approximately 19,000 currently received NLM serials were prepared and will serve as the first major input to the Program's backup file. Aperture cards are also prepared for all new serial titles received by the Library and forwarded to the Library of Congress for registration.

In fiscal year 1973 the Library again negotiated a contract for commercial filming of 1.5 million pages of the serial collection for preservation purposes. Priorities for micro-preservation are being reexamined in order to establish a long-range policy for fulfilling the Library's archival responsibility.

History of Medicine

During the year the Library's historical collections were enriched by a number of

outstanding acquisitions. These included two incunabula, Rolando Capelluti, *Tractatus de curatione pestiferorum apostematum*, Rome [1486/1500], and Johann Tollat von Vochenberg, *Ein gut Erczneybuchlin*, Augsburg, Hans Froschauer, 1499. Neither is recorded in Goff's census of incunabula in the United States. Serious gaps in the collection were filled through the acquisition of such diverse works as the first English translation of Fracastoro's *Syphilis* (London, 1686), the first edition of Robert Burton, *The Anatomy of Melancholy* (Oxford, 1621), and the third edition of Benjamin Rush's *Medical Inquiries and Observations* (Philadelphia, 1809). An outstanding rarity was the collected works of Galen published in Lyon in 1528, hitherto known to exist as a complete 3-volume set only in Leningrad.



From the title page of volume one of the collected works of Galen, 1528, a three-volume set added to the historical collection in FY 1973.

Table 9. History of Medicine Activities

	FY 1971	FY 1972	FY 1973
Acquisitions			
Books -----	1,284	1,265	936
Modern manuscripts -----	141,142	36,325	13,819
Oral history hours -----	10	43	52
Prints and photographs -----	753	479	1,100
Processing			
Titles cataloged -----	1,618	3,002	2,192
Modern manuscripts cataloged -----	41,441	20,362	45,890
Pictures indexed -----	250	571	526
Articles indexed -----	3,114	2,892	4,270
Pages microfilmed -----	173,733	153,441	160,220
Public Service			
Reference questions answered -----	1,755	2,113	1,936
ILL and pay orders filled -----	1,880	1,821	2,140
Reader requests filled -----	4,717	5,784	6,278
Pictures supplied -----	2,010	1,888	1,782

More modern historical source materials acquired were oral history interviews with Shields Warren, M.D., and others, including a collection of 23 interviews by Milton Senn, M.D., in connection with his history of the child development movement. Additions to the manuscript collection were donated by William S. Middleton, M.D., Chauncey D. Leake, Ph.D., William B. Bean, M.D., W. Palmer Dearing, M.D., and others. Several twentieth-century examples were added to the print collection, notably "Base Hospital" by George Bellows.

During the year, nearly 6,300 books, manuscript boxes, and oral history memoirs were provided to readers in the Library (Table 9). Over 2,000 items were furnished in inter-library loan or in photocopy and nearly 1,800 photographs and slides were supplied in answer to requests for pictorial material. To improve access to the collection, and in anticipation of future publication, over 2,000 books and serial titles were cataloged.

Specialized Information Services

The Library's Specialized Information Services administers the Toxicology Information Program, established in 1967. The objectives of the Program are to create computerized toxicology data bases with information from cooperating governmental, industrial, and academic institutions and to provide information services in toxicology to the scientific community. This Program operates in close collaboration with its affiliated Toxi-

cology Information Response Center at the Oak Ridge National Laboratory, Tennessee. Together, they create data bases and provide services by using input from the scientific literature, specialized files, and contributions from subject experts. The Program provides services in three modes: responses to queries, publications, and an on-line interactive information retrieval system.

During 1973, the Toxicology Information Response Center at Oak Ridge performed over 500 comprehensive literature searches in response to requests from scientists. These searches cover all segments of toxicology and result in bibliographies which are mailed directly to the requester. A bibliography may include print-outs derived from TOXLINE and MEDLINE (see On-Line and Regional Services) and literature citations that are obtained manually from conventional secondary literature services such as *Chemical Abstracts* or *Biological Abstracts*. In February 1973, a \$50 charge per search was initiated to help defray a portion of the total cost of providing this query response service. The National Technical Information Service, Department of Commerce, performs the billing and collecting functions for the Toxicology Information Response Center. In addition, 81 of the more extensive literature searches completed by the Center, considered to be of interest to a wider scientific community, were published through the National Technical Information Service.

III. GRANTS FOR LIBRARY ASSISTANCE

Staff of the Library's Extramural Programs worked under an unusual sense of urgency this year in processing grant applications from medical institutions in Wilkes-Barre, Pennsylvania. A number of hospital and college libraries in that area were damaged and some virtually wiped out in June 1972 as a result of Hurricane Agnes and the devastating flood waters she brought. Staff from NLM and the Mid-Eastern Regional Medical Library made several visits to Wilkes-Barre to assist in coordinating relief for the libraries. Grant proposals from the stricken institutions were processed by NLM staff and approved by the Biomedical Library Review Committee in record time.

Medical Library Assistance Act

The first extension of the Medical Library Assistance Act expired at the end of fiscal year 1973. The authorities of this Act were continued under a second extension contained in the Health Programs Extension Act of 1973.

The assistance programs administered by the Library's Extramural Programs were functionally reorganized during the fiscal year. The reorganization reflects a management philosophy which places a new emphasis on grant program objectives which support and complement the overall goals of NLM. This new approach consists of es-

tablishing broad, interrelated concepts or program objectives as the target areas for grants. It will permit a focusing of all grant mechanisms, such as resource grants and research grants, on specific common goals. It will define how each grant program can contribute to the accomplishment of the objectives and it will, in later phases, evaluate the extent of the contribution.

The reorganization also established a new administrative structure for the Library's grant programs. Under the direction of the Office of the Associate Director for Extramural Programs, the Division of Biomedical Information Support and the International Programs Division have the direct responsibility for grant operations. The Office of Program Planning and Evaluation analyzes and evaluates the long-range program effectiveness and coordinates program planning in relation to NLM's goals and national needs.

Specifically, NLM provides grant support for research, improvement of library services, training, special scientific projects, biomedical publications, and Regional Medical Libraries.

Research Grants

Research, development, and demonstration projects were undertaken in the areas of (1) medical libraries and librarianship, (2) biomedical information science and services, (3) education and knowledge transfer, and (4)

Table 10. Legislative History of Library Assistance

	Period Covered	Total Appropriated
P. L. 89-291 Medical Library Assistance Act of 1965	July 1, 1966- June 30, 1970	\$41,306,000
P. L. 91-212 Medical Library Assistance Extension Act of 1970	July 1, 1970- June 30, 1973	\$19,506,000
P. L. 93-45 Health Programs Extension Act of 1973	July 1, 1973- June 30, 1974	

history of medicine and life sciences. There were 16 new awards for such research in FY 1973, bringing the number of active grants to 33.

An example of a research award made in the area of medical librarianship is a project which tests new roles for medical librarians. In this study the librarian will become an integral part of a teaching team with responsibility to observe, record, and fulfill the biomedical information needs of students, faculty, and patients. A project in the area of biomedical information science seeks to obtain, from machine-readable tapes of an English-language dictionary, general rules which can help overcome serious problems with computers handling natural languages, especially where medical terms are concerned. This study should contribute to the refinement of manual and automatic techniques of medical thesaurus construction.

A project in the area of education and knowledge transfer seeks to design computer-assisted instruction programs for "intelligent" terminals distant from a central computer. Learning programs for "intelligent" terminals should make possible the development of an interactive teaching capability which students can use without overloading an entire computer system. In the history of medicine category is a study to analyze changes in health and medical practices in the Indian and Oklahoma territories during the latter part of the 19th century. The results could be significant in understanding the present day health situation of American Indians and other ethnic minorities.

Resource Grants

Medical library resource grants are authorized for the purpose of making the scholarly record more accessible to health practitioners, researchers, and educators by developing, improving, and expanding services in the Nation's health science libraries. A primary objective of resource grants is to implement programs which complement and further develop the Regional Medical Library Program. There are two types of resource grants—a one-year, \$3,000 Improve-

ment Grant and a one-to-three year Project Grant. The Improvement Grant is intended to help in acquiring resources to serve the basic information needs of the institution and to motivate the institution to make a commitment for future library support and to become an entry point of the Regional Medical Library network. The Project Grant is intended to establish new services and improve and expand existing services.

In fiscal year 1973, a total of 101 Project Grant applications and 191 Improvement Grant applications were received. Of the \$2,297,541 available, \$954,328 was allocated for 70 new Improvement Grant awards and 26 new Project Grant awards. A total of \$34,630 was used to support commitments for the continuation of 15 formula grants made under the Medical Library Assistance Act of 1965, and \$1,308,583 was allocated to the continuation of 42 Project Grants.

Training Grants

Training for biomedical librarians has been primarily through advanced on-the-job training programs. The training of other biomedical communications and information science personnel, medical historians, and health science writers was also supported. Included in the training category are fellowships which are awarded directly to individuals. Support for fellowships is available in the same general categories as for training grants. At the end of the fiscal year there were 20 training programs active which were supporting 124 trainees. In addition, there were seven active fellowships.

A decision was made by DHEW this past year to phase out gradually Federal support of biomedical training. Under the phase-out, all programs are funded through the balance of the current commitment to trainees, but no new training grants can be made. In general, support can be provided to trainees or to fellows to whom a firm commitment was made prior to January 29, 1973.

Special Scientific Project Awards

These projects are for eminent scholars to produce comprehensive treatises in their

area of specialty. They include monographs, scholarly documentation, evaluation, and analysis of social, cultural, or scientific advances. During the year there were four active Special Scientific Projects, including one for the preparation of a monograph on the pathophysiology of respiratory disease, integrating both basic science and clinical information.

Publication Grants

During FY 1973 the administration of the Publication Grant Program was merged with the over-all NLM publication support program in the International Programs Division. Support is provided for preparation

and publication of: (1) critical reviews of the present state of knowledge in health science fields, (2) secondary literature tools, including bibliographies, guides, atlases, handbooks, abstracts, and indices, (3) primary or secondary publications in the fields of medical librarianship, health information science, and biomedical communications, (4) temporary support for serial publications to develop innovative approaches to periodical information packaging, (5) histories of medicine, of medical research, and of the provision of health services, (6) English translations of foreign biomedical monographs, and (7) proceedings of international symposia and conferences related to U.S. health needs.

Table 11. Summary of Extramural Programs

Program	New Grants FY 1973	Active Grants & Contracts June 30, 1973	Grants Completed FY 1973
Research Grants -----	16	33	16
Resource Grants -----	96	181	312
Training Grants and Fellowships ---	3	27	2
Special Scientific Projects -----	0	4	2
Publication Grants -----	8	26	5
Special Foreign Currency Projects* -	41	116	21
Regional Medical Library** -----	6	13	0
Total -----	170	400	358

* See International Activities

** See On-Line and Regional Services

IV. ON-LINE AND REGIONAL SERVICES

On-line search capability of the Library's data bases increased dramatically in 1973. A new lexicon has sprung up around the search services—terms such as MEDLINE, TOXLINE, SERLINE, CATLINE, SDILINE, and COMPFILE. As the availability of the services expands, these names are gradually becoming familiar to health professionals in medical institutions around the Nation. At the end of the fiscal year, some 180 institutions had terminals to access MEDLINE. That data base, and several of the others mentioned above, are now available in every state; nearly all medical schools and many hospitals are users of the service.

MEDLINE

MEDLINE (MEDLARS On-Line), the nationwide, on-line bibliographic retrieval system which enables the user to search a significant portion of the MEDLARS files for bibliographic information, was operational during the entire 1973 fiscal year period. To the user at a remote computer terminal, MEDLINE provides almost instantaneous, interactive searching of about 450,000 citations from 1,200 of the world's leading biomedical journals. The result of searches performed may be printed directly on the user's terminal (on-line) or, if a large number of citations is involved, it may be printed by the NLM computer (off-line) and mailed to the user. The growth of MEDLINE service has been dramatic: from 5,036 searches in the month of July 1972 to 17,933 searches in June 1973.

MEDLINE service is provided 70 hours per week through a communications network which allows access through a local dataphone call in any of 50 major metropolitan areas across the Nation. The communications network also has a node in Paris and is being used regularly by the French MEDLARS Center and by the Mill Hill Research Center in London. Ten Canadian Centers are regular users of the service. MEDLINE is also oper-

ated on a computer in Sweden and accessed by remote terminals in eight locations in Sweden and one each in Denmark, Finland, and Norway. There are plans to install MEDLINE in Brazil.

With the rapid expansion of MEDLINE service, the use of MEDLARS batch-type searches has dropped sharply. By the last few months of the year, NLM was receiving only occasional requests for MEDLARS searches in instances where the character of the search made MEDLINE searching difficult.

An evaluation of the MEDLINE service conducted in March 1973 indicates that about half of the searches are done in connection with medical research, about a third are for patient care, and the remainder are for educational and other uses. During the year a computer-aided instruction program was developed to teach health professionals how to use the MEDLINE service.

MEDLINE services were provided free of charge to using institutions in FY 1973. A decision has been made to levy a charge for MEDLINE in order to acquire the resources to meet the expanding need for service. A charge of 10 cents a minute and 10 cents a page for off-line prints will be imposed early in FY 1974.

In December 1972, the prototype service AIM-TWX (Abridged Index Medicus via the Teletypewriter Exchange Network) was terminated. This service, initiated in 1970, had proven the value of on-line bibliographic services and led to the development of MEDLINE at NLM.

New Services

Originally the MEDLINE program was only able to search a single data base. During FY 1973 work was undertaken and completed to make it possible for a user to access any of several data bases:

SDILINE (Selective Dissemination of Information On-Line) is a complete file of the

Table 12. Summary of FY 1973 On-Line Services

	FY 1973	FY 1972
MEDLINE Searches -----	141,730	22,000 (est.)
SDILINE Searches -----	13,363	-----
COMPFILE Searches -----	1,651	-----
CATLINE Searches -----	1,601	-----
SERLINE Searches -----	477	-----
TOXLINE Searches -----	6,000*	-----
Total On-Line Searches -----	164,822	22,000 (est.)
Off-Line Prints		
MEDLINE -----	40,115	6,618
SDILINE -----	5,865	-----
COMPFILE -----	1,611	-----
CATLINE -----	9	-----
Total Off-Line Prints -----	47,600	6,618

* Estimated for the period September 1972 through June 1973.

next month's *Index Medicus* citations available for test searching and current awareness services. During the first nine months of operation of SDILINE, over 13,000 searches were performed for the user network.

COMPFILE is the complement of the MEDLINE file, i.e., the citations since January 1970 to the 1,000 journals input to MEDLARS and *Index Medicus* but not in MEDLINE. Although COMPFILE was available only for eight months on a very limited basis, over 1,600 searches were performed on this data base.

CATLINE (Catalog On-Line) will offer access to monograph catalog citations early in FY 1974. In spring of 1973 a test data base was mounted which contained full bibliographic data for titles cataloged and input by NLM and two cooperative cataloging partners—Countway Library at Harvard and Upstate Medical Library of SUNY. The data base was then searched on an experimental basis by these three libraries, and also by the Library of the Texas Medical Center and the Biomedical Library at UCLA. By August it is anticipated that the entire catalog data base from 1965 to date will be generated for use by the user network.

SERLINE (Serials On-Line) will provide on-line access to the bibliographic data for some 6,000 serial titles as well as the locator codes identifying the Regional Medical Library and the specific Resource Libraries within each of the 11 regions holding a given

title. SERLINE's prime function will be to provide on-line bibliographic and locator information in support of network interlibrary loan activity. SERLINE is expected to be available for use in early FY 1974.

Training

Training classes for librarians from institutions joining the MEDLINE user network continued at NLM and UCLA. In addition to numerous demonstrations by NLM personnel and assistance with regional workshops, the Library also developed, in cooperation with the Committee on Continuing Education of the Medical Library Association, two continuing education courses which were presented under the sponsorship of the Medical Library Association during the 1973 annual meeting in Kansas City. The first was a one-day course to introduce librarians to MEDLINE. The second, a half-day course for library administrators, provided an overview of the system and its capabilities as well as the application and utilization of on-line services in their respective institutions. The *NLM Technical Bulletin*, a newsletter for network participants, was further expanded to include contributions from librarians active in the Regional Medical Library Network.

MEDLARS II

In 1971 NLM began developing under contract a more powerful computer program

for a second-generation Medical Literature Analysis and Retrieval System (MEDLARS II). The current phase of MEDLARS II development consists of an improved file generation/maintenance system, a new set of programs to produce output for photocomposition, and additional search capability. It is expected to be completed in FY 1974.

In full operation, MEDLARS II will incorporate the following elements: increased processing capability; on-line storage devices permitting direct access to the data base; multiprogramming capability which will permit several tasks to be performed by the computer simultaneously; and on-line access to data bases from remote terminals. Translated into program capabilities, the new features will provide an improved retrieval capability through an expanded and more flexible vocabulary for both input and search.

Facility Changes

The Office of Computer and Communications Systems undertook three significant actions in FY 1973 to enable continued expansion and improved performance of the NLM computer facility. In February, three additional disk storage devices (600,000,000 characters of storage) were obtained. This has permitted continued growth of the retrieval services. Second, provisions have been made for the installation of an improved and larger communications control device. This will remove a major restraint on the effective use of the NLM computer by making possible the use of our computer by up to 60 users simultaneously. Currently the limit is 48 users.

Third, NLM has negotiated a contract with the State University of New York (SUNY) to provide MEDLINE service in the event of the failure of the NLM computer and to handle the peak load of MEDLINE users in midafternoon. The SUNY computer was connected to the network and has provided MEDLINE service 44 hours per week since late February 1973.

TOXLINE

The new on-line toxicology literature retrieval service, TOXLINE (formerly TOXICON), has been offered to the biomedical community as a subscription service since October 1972. TOXLINE is managed by the Library's Specialized Information Services (Toxicology Information Program) through a contractor. The service provides the subscriber with remote, on-line access to a data base consisting of citations enriched with index terms or full abstracts dealing primarily with the toxicology/pharmacology of drugs, pesticides, environmental pollutants, and hazardous household or industrial chemicals. Communication with the system is accomplished through terminals which link the users to a computer through the same communication network that supports MEDLINE.

As of June 1973 TOXLINE contained the following information files:

- *Toxicity Bibliography*; a MEDLARS subset of 75,000 citations with MeSH terms, 1968-June 1973.
- *Chemical Biological Activities*; a CAS service of 136,000 abstracts with CAS Registry numbers, 1965-May 1973.
- *Abstracts on Health Effects of Environmental Pollutants*; BIOSIS-NLM service with citations, abstracts, CAS Registry numbers, 1972-February 1973.
- *Health Aspects of Pesticide Abstract Bulletin*; a publication of the Environmental Protection Agency with 10,400 abstracts, CAS Registry numbers, 1966-May 1973.
- *International Pharmaceutical Abstracts*; a service of the American Society of Hospital Pharmacists with 16,500 abstracts, 1970-March 1973.
- *Hayes File*; a collection of 10,000 citations of articles on the health effects of pesticides, 1950-1966.

TOXLINE is available by subscription for an initial fee of \$350 to cover training and user support and a cost of \$45 per hour for terminal access. The service had 35 private

industry, government, and university subscribers in June 1973 and is growing rapidly.

A TOXLINE Chemical Dictionary is being created to assist users in the retrieval of chemical substance names from the TOXLINE file. When completed, this dictionary file will contain: (1) all Chemical Abstracts Service (CAS) Registry numbers cited in TOXLINE files; (2) all the names from the CAS Registry Master Nomenclature File for TOXLINE compounds (as identified by CAS Registry numbers); (3) molecular formulae; and (4) nomenclature fragments. It is estimated that initially this file will contain some 60,000 CAS Registry number records.

The Toxicology Information Program has also initiated the building of an on-line interactive Toxicology Data Bank (TDB) which will contain chemical, biological, clinical, and production data on compounds to which the population at large is exposed and which are known to be hazardous. A prototype of the TDB was constructed and is operational for experimental use. Efforts will continue during the next year to develop and expand this data base with a goal of having approximately 1,000 compounds and associated data in the TDB by June 30, 1974.

Regional Medical Library Program

The Regional Medical Library (RML) Program, which seeks to develop a national network of library services, presents a unique opportunity to promote cooperation among institutions within the 11 regions in making the Nation's medical library resources more readily available. In fiscal year 1973, ten contracts for a total of \$2,129,843 were

awarded to RML institutions to provide document delivery services and to plan, coordinate, and expand other library services. In addition, Regional Medical Library grants are available to complement the service contracts. Six new RML grants were awarded this year in the amount of \$169,839; \$201,336 was awarded for the continuation of RML grants funded in 1972.

In 1973 NLM began to evaluate the Regional Medical Library Program on a continuing basis. As a part of this effort, site visits were made to five of the Regional Medical libraries: (1) East Central Region at Wayne State University, (2) New York and Northern New Jersey Region at the New York Academy of Medicine, (3) Mid-Eastern Region at the College of Physicians of Philadelphia, (4) Mid-Atlantic Region at the National Library of Medicine, and (5) Pacific Northwest Region at the University of Washington. The remaining six regions will be evaluated in 1974.

The purpose of the first visit to each RML is to familiarize the site visitors, including consultants to NLM, with the objectives, services, and activities of the Regional Medical Library. The two-day site visits involve not only the consultant team, NLM Extramural Programs staff, the Regional Medical Librarian, and the Advisory Group to the Regional Medical Library, but also include institutional "clients" of the RML—personnel and officials of health institutions in the Region. After the first round of site visits, a structured evaluation methodology will be employed to assess progress in relation to plans and goals.

V. THE LIBRARY PUBLISHER

In keeping with its responsibilities to stay abreast of trends in medical publishing, the Library hosted a seminar on September 18, 1972 to examine the problems and mechanisms of modern medical communications. Irvine H. Page, M.D., editor of *Modern Medicine*, moderated a panel that included such other distinguished physician-editors as John A. D. Cooper, former editor of the *Journal of Medical Education*; Edward Huth, *Annals of Internal Medicine*; Franz J. Ingelfinger, *New England Journal of Medicine*; and George L. Fite, a senior editor of the *Journal of the American Medical Association*.

The panelists and 40 other invited editors of biomedical journals held lively, open discussions on the copyright issue, the dubious value of many redundant published reports, and problems of medical writing and editing. Other topics of discussion were the release of scientific manuscripts prior to formal presentation in publications, the selection of periodicals for indexing and abstracting, and the place of the medical journal in the learning process.

Distribution

The Library has a long-standing commitment to prepare and support publications of importance both to researchers in biomedicine and to those who work directly in the field of health care delivery. Today, NLM is one of the world's major publishers of medical bibliographies, catalogs, and other reference publications for the biomedical community. During fiscal year 1973 the Library produced or supported the publication of more than 200 titles containing over 80,000 pages.

The Library distributes several of its smaller publications without charge, but larger publications are sold through the two official Government distribution centers—the Superintendent of Documents (U.S. Government Printing Office) and the National Technical Information Service (Department of Commerce).

This year the Library made greater use than ever before of the National Technical Information Service (NTIS). Located in Springfield, Virginia, NTIS distributes government reports and other technical publications in both microfiche and print copy. In addition to some 80 new toxicology literature searches (described below), NTIS also has available the following specialized MEDLARS publications: (1) *MEDLINE Training Syllabus*, (2) *MEDLINE Reference Manual*, (3) *MEDLARS Indexing Manual*, (4) *Permuted Medical Subject Headings*, (5) *MEDLARS Indexing and Searching Aids*, (6) *Medical Subject Headings: New Main Headings and Provisionals*, (7) *Medical Subject Headings Tree Structures*, and (8) *Medical Subject Headings Alphabetic List*.

New NLM Publications

The Library distributed more than 49,000 copies of Literature Searches in FY 1973, an increase of 15,000 over 1972. Literature Searches are bibliographies on selected subjects of wide interest, distributed to the biomedical community. A new service to a limited number of institutions made these bibliographies available on a "standing order" basis. Thirty-one new searches were printed during the year, including bibliographies on such wide-interest subjects as "Acupuncture," "Family Planning Programs," "Air Pollution Effects," "Drug Therapy of Alcoholism," and "Psychological Aspects of Cancer."

Twenty-six recurring bibliographies are now regularly produced through MEDLARS in addition to *Index Medicus* and *Abridged Index Medicus*. Some of these are sponsored directly by NLM, although the majority are published by outside organizations. Newly added during the year were a *Hepatitis Bibliography*, sponsored by the National Institute of Allergy and Infectious Diseases, and a *Bibliography of Plastic and Reconstructive Surgery*, sponsored by the Ameri-

can Society of Plastic and Reconstructive Surgeons.

Among the new publications prepared by NLM in FY 1973 is the *Index of NLM Serial Titles*. This index to the entire NLM current serial record file of approximately 19,000 titles was published in August 1972. The *Index* was extracted from the Medical Library Center of New York's *Union Catalog of Medical Periodicals* data base. Since 1967, the National Library of Medicine has contracted with that organization to create machine-readable records for NLM's currently received serial titles. Production of the index was made possible by the use of programs developed by the Library of Congress for generation of "camera-ready" copy by GPO's high-speed Linotron photocomposition machine. The *Index*, as a KWOC (Key-Word-Out-of-Context) listing, provides multiple access points to serial titles, and in each instance provides the appropriate NLM call number. It is expected to be a useful tool in the interlibrary loan operations of the Regional Medical Library Network.

Bibliography of the History of Medicine, No. 6, 1970, is the sixth volume in a series of annual bibliographies on the history of medicine. It includes approximately 3,200 citations to journal articles, monographs, and historical chapters in general monographs.

Toxicology Publications

About eighty bibliographies compiled by TIP's Toxicology Information Response Center at the Oak Ridge National Laboratory, were made available from NTIS. The searches cover a wide variety of topics, such as "Drug Treatments for Geriatric Patients in Nursing Homes" and "Effects of Narcotics, Narcotic Antagonists, and Narcotic Substitutes on the Mammalian System." TIP also prepared a public information brochure describing its programs and services.

The monthly abstract journal entitled *Abstracts on Health Effects of Environmental Pollutants* was continued under a collaborative arrangement with Biological Abstracts.

This specialty publication includes abstracts on environmental pollutants and their effects on human health, abstracts on occupational health and industrial medicine, and reports of analytical methods for examining biological tissues or fluids.

Drug Interactions—An Annotated Bibliography with Selected Excerpts, Vol. 1 (1967–1970), provides physicians and other health professionals with quick access to 3,000 reports from the world's published literature on drug-drug and drug-chemical interactions. The bibliography is divided into two major sections: "Human Excerpts" and "Animal Excerpts." A listing of citations referring to *in vitro* studies, reviews, editorials, and other miscellaneous articles is also included.

The following four monographs, available from NTIS, were also supported by the Library's Toxicology Information Program:

Toxicity and Health Threats of Phthalate Esters: Review of the Literature. Polychlorobiphenyl (PCB) and Related Chlorophenyls: Effects on Health and Environment I. Bibliography 1881–1971. Metabolism of Foreign Compounds: An Annotated Bibliography (six issues). *Requirements for Mathematical Models in the Toxicology Information Program.*

Health Education Publications

A Bibliography of Audiotape and Tape-Slide Programs Applicable to Undergraduate Medical Education was prepared under contract for the Lister Hill Center by Frank D. Allan and Helene Zubkoff of the George Washington University Medical School. The bibliography, available from NTIS, is a "finders' guide" to 790 audiotapes available from medical schools and other sources.

A Guide to Computer Instruction in the Health Sciences was compiled by Rutgers Medical School and the University of California at San Francisco. Representing the first such comprehensive index, the *Guide* lists 362 CAI courses in medicine, nursing, dentistry, pharmacology, veterinary medicine, and other disciplines, obtained from 205 participating institutions. It was supported

by the Lister Hill Center and is available from NTIS.

During the fiscal year contracts were let for a series of monographs and technical publications to assist schools of the health sciences in developing instructional media programs. Two monographs in this series have been published by NMAC: *Instructional Development Unit*, by James S. Waldron, Ph.D., provides a guide to organizing an instructional development unit, including staffing, space, and equipment requirements, and *Medical and Graphic Arts Unit*, by Herbert R. Smith, Jr., a booklet designed to aid in establishing a medical and graphic arts unit as a component of a comprehensive communications department in a health science educational institution.

Grant Supported Publications

The Library administers a grant program to support nonprofit scientific publications. Twenty-six publication grants were active on June 30, 1973. Among the eight new awards were: support for an innovative program for the preparation and publication of summaries and reports in the field of medical entomology; the development of a compendium of information on computerized health sciences teaching material; and a comprehensive study of the development, growth, and evaluation of an innovative and highly individualized curriculum of a major medical school.

The following publications resulting from grant awards made in prior years appeared in FY 1973:

- Altman, Philip L. and Dittmer, Dorothy S. (eds.). *Biology Data Book*. Bethesda, Maryland: Federation of American Society for Experimental Biology, Vol. 1, Second Edition, 1972.
- Bloomquist, Harold; Rees, Alan M.; Stearns, Norman S.; and Yast, Helen (eds.). *Library Practice in Hospitals; A Basic Guide*. Cleveland, Ohio: The Press of Case Western Reserve University, 1972.
- Levine, Norman D. (ed.) and Plous, Frederick K. (trans.). *The Ecology of Ani-*

mals. Urbana, Illinois: University of Illinois Press, 1972.

Ludmerer, Kenneth M. *Genetics and American Society*. Baltimore, Maryland: The Johns Hopkins University Press, 1972.

Lutzker, Edythe. *Edith Pechey-Phipson, M.D.* Jericho, New York: Exposition Press, 1973.

Mossman, Harland W. and Duke, Kenneth L. *Comparative Morphology of the Mammalian Ovary*. Madison, Wisconsin: The University of Wisconsin Press, 1973.

Vockeroth, J. R. "A Review of the World Genera of Mydaeinae, with a Revision of the Species of New Guinea and Oceania (Diptera: Muscidae)," *Pacific Insects Monograph 29*, October 20, 1972.

Washington University School of Medicine Library. "Medi-Kwoc Index: An Index to the Published Proceedings of Conferences and Symposia on Biomedicine," Vol. 1, No. 1, January 1973. St. Louis, Missouri, 1973.

Staff Bibliography

The Library's professional staff was active in publishing scientific and technical papers in journals as general as *American Scientist* and as specialized as *Clinical Toxicology*. The 23 published articles or chapters of larger works by NLM authors in fiscal year 1973 are:

Caldwell, W. H. and Kissman, H. M. The National Library of Medicine: its scope and goals. *Hosp. Formul. Manage.* 8(4): 6-8, 1973.

Cassedy, J. H. John L. Riddell's *Vibrio biceps*: two documents on American microscopy and cholera etiology 1849-59. *J. Hist. Med.* 28(2): 101-108.

Clayton, F. W. The Toxicology Information Program of the National Library of Medicine. *Clin. Toxicol.* 5:283-294, 1972.

Corning, M. E. The U.S. National Library of Medicine and international MEDLARS cooperation. *Inform. Stor. Retr.* 8:255-264, 1972.

Cummings, M. M. Wilbert C. Davison and medical libraries. *Amer. J. Dis. Child.* 124: 340-342, 1972.

Cummings, M. M. and Corning, M. E. Biomedical communications: developing a mechanized library network. In Buckman, T. R., Suzuki, Y., and Tsuneishi, W. M. (Eds.). *University and Research Libraries in Japan and the United States*. Chicago: American Library Association, 1972, pp. 224-233.

Cummings, M. M. Publications: progress or pollution. *Am. Sci.* 61(2): 163-166, 1973.

Gluckstein, F. P., Konnerup, N., and McCully, R. M. African horsesickness. In Catcott, E. J. and Smithcors, J. F. (Eds.) *Equine Medicine and Surgery* (2nd ed.). Wheaton, Illinois: American Veterinary Publications, Inc., 1972, pp. 64-70.

Howard-Jones, N. Was Shibasaburo Kitasato the co-discoverer of the plague bacillus? *Perspect. Biol. Med.* 16(2): 292-307, 1973.

Howard-Jones, N. Cholera therapy in the nineteenth century. *J. Hist. Med.* 27(4): 373-395, 1972.

Jablonski, S. The preconstructed vocabulary: a Procrustean bed. *Bull. Med. Libr. Assoc.* 61(1): 21-23, 1973.

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Table 13. NLM Publications Available from GPO

Title	Number Printed for Sale (per issue)
Index Medicus -----	6,500
Cumulated Index Medicus -----	5,000
Abridged Index Medicus -----	4,000
Cumulated Abridged Index Medicus -----	1,500
Monthly Bibliography of Medical Reviews -----	900

Title	Number Printed for Sale (per issue)
Current Bibliography of Epidemiology (Monthly) -----	600
Current Bibliography of Epidemiology (Annual) -----	750
Toxicity Bibliography -----	850
Selected References on Environmental Quality as It Relates to Health -----	800
NLM Current Catalog (Monthly Listing) -----	1,300
NLM Current Catalog (Quarterly Listing) -----	1,100
NLM Current Catalog (Annual) -----	1,000
Index of NLM Serial Titles -----	2,000
Drug Interactions Bibliography -----	2,000
List of Journals Indexed in Index Medicus -----	2,500
Medical Subject Headings -----	8,000
Bibliography of the History of Medicine -----	3,000

VI. AUDIOVISUAL PROGRAMS

In a time when there is much discussion about the numbers and training of health care personnel, the Library is placing great emphasis on audiovisual activities in support of health sciences education. The programs of the National Medical Audiovisual Center (NMAC) in Atlanta, the Library component with primary responsibility for these activities, are augmented and complemented by the pooling of resources with the Office of Audiovisual Educational Development of the Bureau of Health Resources Development (formerly the Bureau of Health Manpower Education), Health Resources Administration.

Common program activity areas have been well defined and priorities indicated by the Board of Regents. Significant progress during 1973 included testing an on-line retrieval system for audiovisual material, developing preliminary system specifications for an audiovisual systems information dissemination program, increasing evaluation efforts through contracts, awarding a contract for film booking services, increasing the number of experimental workshops to explore team techniques for instructional media development, expanding advisory services, and supporting instructional materials development efforts in health professional institutions.

Clearinghouse for AV Information

Major efforts have continued to develop an automated data base of information on non-print instructional materials relevant to professional education in medicine and allied health sciences. Approximately 1,800 titles to be included in a clearinghouse of such material have been evaluated, cataloged, indexed, and keypunched. Of these, 165 have been entered into the computer for limited testing. It is anticipated that the remaining items will be entered and tested during FY 1974. Data on the organization and management of biomedical communication programs in 55 schools of the health sciences have also been transferred to magnetic tape for input

into the NLM computer. The file, to be updated via a terminal at NMAC, will serve as an information resource for providing advisory services to other schools of the health sciences.

Evaluation and Acquisition

Evaluation activities were greatly expanded during FY 1973. Twenty-six national professional organizations were involved in cooperative projects to evaluate instructional media. These efforts are augmented by contractual agreements between NLM and the Association of American Medical Colleges and the American Association of Dental Schools. One study, done under contract by the Southwestern Medical School in Dallas, has furnished data on the comparative effectiveness of three formats for teaching ophthalmoscopy. The results of this study are being analyzed and will be available in FY 1974.

Space is being made available to house a collection of media resources to be used in the preparation of instructional materials. A large collection of archival medical films has been received from the American Medical Association and is being indexed. Additionally, the Child Study Center of Yale University has offered an entire collection of films on child development.

A new user evaluation form has been developed to collect information about material distributed through the Center. The form is being used on a trial basis with both the film and videotape distribution systems. Preliminary results show a marked increase in the percentage of forms returned. This feedback is helpful in improving program content and service.

Distribution

Approximately 64,500 requests for loans of audiovisuals were filled by the shipment of films from the NMAC collection. To facilitate

the processing of loan requests, a contract has been awarded to Modern Talking Pictures to handle film bookings. During the year 106 new films were added, bringing the number of audiovisuals available on loan to 1081. The program to upgrade the quality of the Center's film collection continued—approximately 150 lay-oriented or obsolete titles were eliminated from the collection. These discontinued prints were transferred to alternate distribution centers or returned to the sponsoring agency.

The program of replicating videotapes from master instructional programs in the Center's collection continues as a popular program: in 1973 3,567 copies were reproduced in response to requests from schools for use in their teaching programs. The content coverage has been expanded and now includes about 250 titles. Beginning in FY 1974 there will be a fee to recover reproduction costs.

Eight self-instructional units were placed with the General Services Administration for sale through the U.S. Government Film Sales program: *Introduction to Congenital Heart Disease, Parts I and II*; *The Neurologically Suspect Infant, Respiratory Distress Syndrome, and Anemia in the First Week of Life* (Pediatric Newborn Series); *Ophthalmoscopy: Basic Self-Instruction for Medical Students*; *Glaucoma Screening—Tonometry*; and *Introduction to the Neurovascular Examination*.

Workshops and Conferences

Nine five-day instructional design workshops were conducted for a total of 80 participants at the Center. At these workshops, faculty participants, working with artists, jointly design audiovisual instructional presentations and gain the necessary expertise to develop effective units in their own institutions. Workshops were conducted for the Association of Medical School Pediatric Department Chairmen, faculty members from Departments of Pathology, the Society of Nuclear Medicine, the American Association of Anatomists, and the Association of Anatomy Chairmen. As a result of these work-

shops, many slide/tape instructional presentations were developed, field tested, and made available for distribution.

Five regional seminar/workshops were conducted at universities on the management of 35mm medical slide collections. The total number of participants was 175. NMAC staff members also participated in six training workshops on media management with a total of 350 participants. In addition, the Center sponsored a seminar on evaluating multimedia instructional programs.



NMAC conducts numerous workshops and conferences for health science educators.

The third annual national Conference of Directors of Biomedical Communication was hosted by NMAC on October 30–31, 1972, with 67 full-time directors attending. The Conference theme was "Instructional Development." Mediated instructional packages produced at 35 of the schools were displayed and demonstrated. Many of these packages were donated for permanent retention and display in NMAC learning resource areas.

Advisory Services

Ten surveys or site visits for consultation were conducted at the following institutions: Memorial University of Newfoundland Health Sciences Center; University of Kansas Medical Center; University of Oregon Medical School; The Neuropsychiatric Institute, University of California Health Sciences Center, Los Angeles; Drew Postgraduate Medical School and Martin Luther King, Jr., Memorial Hospital, Los Angeles; State Uni-

versity of New York School of Medicine, Buffalo; Medical College of Georgia, School of Dentistry, Augusta; Medical College of Ohio at Toledo; University of Hawaii Health Sciences Center; and University of Louisville Health Sciences Center.

Audiovisual facilities planning assistance was provided to 18 institutions, including hospitals and schools of medicine, dentistry, nursing, allied health, and veterinary medicine. Consultation and assistance on specific problems in the area of facilities planning were provided to 124 institutions through correspondence, telephone, and visits to NMAC by health sciences faculty. Advisory services for educational technology and instructional media development were provided on 122 occasions to 191 health sciences faculty representing 112 schools of medicine and allied health, hospitals, and health-related organizations. Of these, 33 were visitors from foreign countries.

The establishment of the Demonstration Learning Resource Center in FY 1972 has proven to be a sound concept for demonstrating the use of carrels and other audiovisual equipment for self-instruction. Since its inception, a total of 335 persons representing schools of the health sciences and other health agencies, have toured the facility. All were briefed on the planning, space, funding, equipment, personnel, and software requirements for a Learning Resource Center.

A 15-minute 16mm color motion picture documenting innovative educational programs of three health science institutions was completed and is being used by NMAC staff in its consultation program. The film documents the New England Interactive Television Network; the Multi-Media Self-Instructional Study Project, University of Maryland School of Nursing; and the Computer-Assisted Instruction program at the Department of Anatomy of the Emory University School of Medicine.

A project has begun to identify and photograph outstanding examples of facilities design for teaching and learning spaces in schools of the health sciences. A list of institutions has been compiled and arrangements

are being completed for the documentation phase of the project early in fiscal year 1974. Results will be published in a brochure.

Media Development

During fiscal year 1973 the Center completed 12 motion pictures, 23 television productions, 20 slide/tape sets, and three multimedia packages. Some of the pilot instructional units were developed in cooperation with health professionals at seminars and workshops. Others include a three-part series produced with the Emory University School of Nursing on "Family Oriented Maternity Care by the Nurse," and an animated film on "The Autonomic Nervous System." The Southern Medical School Consortium is continuing the development of 60 hours of instruction in a number of curriculum topic areas.

Two single-concept instructional units were developed to demonstrate the incorporation of educational design in motion media. One unit, "Left Ventricle Catheterization," was based on existing X-radiography of the procedure, and was produced on videotape as the best medium for combining art-work with the X-ray photography. The second, "Closed Chest Tube Thoracotomy," was filmed live in the emergency room of a local hospital. Positive results have been obtained from student tryouts of both units.

Two instructional units, "Liver Scanning" and "Focused Collimators," developed under contract with the Society of Nuclear Medicine, are being readied for national distribution through the sales program of the National Audiovisual Center in Suitland, Md. Work continues on a series of self-instructional units at the University of Florida School of Dentistry. Both the Irvine and San Diego branches of the University of California are developing instructional modules in neurology, and the American Gastroenterological Association is continuing work on a series of 12 slide/tape lectures. The materials resulting from these and other projects will be shared with the medical educational community.

VII. HEALTH COMMUNICATIONS RESEARCH

New England Interactive Television Network

At four o'clock on the afternoon of April 26, 1973, groups of people gathered in four rooms separated by as much as 150 miles of rolling mountainous terrain. Each room contained a television screen and a television camera linked to the New Hampshire/Vermont Medical Interactive Television Network. The occasion was a formal dedication of the network, and to demonstrate it to potential users in the two states. Pictures were provided by a taped series of vignettes of typical network programs—a dermatologist in Hanover, N. H., examining a baby in Claremont, N. H., a speech therapist in Burlington, Vt. teaching a girl in Berlin, Vt., physicians in Claremont presenting a surgical case to Dartmouth's grand rounds.

The network is one answer to the problems of continuing medical education faced by those who practice medicine in rural areas. Two-way interactive television is able to bring the medical school classroom to the small community hospital and, simultaneously, able to bring the busy community practitioner to the university classroom.

Supported by the Library's Lister Hill National Center for Biomedical Communications, the network initially consisted of a single link, over leased microwave facilities, connecting Dartmouth Medical School and Mary Hitchcock Memorial Hospital in Hanover with Claremont General Hospital, 30 road-miles away. In the spring of 1972, construction began on a mountaintop microwave network, extending 150 miles to the northwest, linking Dartmouth with the University of Vermont College of Medicine and hospital in Burlington, Vermont. Central Vermont Medical Center in Berlin was added to the network, while Claremont General Hospital was connected over the network microwave links, replacing the leased facilities.

Construction and testing was completed in November 1972. Since then, the network has

become a working tool for the medical and allied health personnel of these four medical centers. During April 1973, for example, the stations were on the air a total of 246 hours, while individual users totaled 2507 hours. Physicians (43 percent) constituted the largest percentage of users with medical and other students (29 percent) second highest.



Senator Norris Cotton of New Hampshire speaks at the dedication of the New England Interactive Television Network.

A typical week's programming includes speech and physical therapy, a course in pharmacology for nursing students, psychiatric consultations, conferences on such topics as neurosurgery and respiratory diseases, and surgical grand rounds.

Satellite Projects

Alaska

For the past two years the Lister Hill Center has been supporting a unique experiment in health care delivery to a number of isolated communities in the state of Alaska. Inexpensive radios are being used at more than 20 village locations to provide reliable voice communications via the NASA Application Technology Satellite, ATS-1, situated in stationary orbit over the equator. The services provided include:

- Voice consultation for community health aides with physicians at Native Health Service Unit Hospitals, and between these physicians and consultants at medical centers.
- Continuing medical education of health aides, nurses, and physicians.
- Education of villagers in personal health matters.
- Communication between hospitalized patients and their families.

Since regular communications are not available to many residents of the remote areas of Alaska, the reliable experimental physician consultation service has been enthusiastically received. Based on a preliminary evaluation of the experiment, Stanford University has documented a 400 percent increase in the number of village patients that are now being treated with the advice of a physician, as compared with previous years when the unreliable high-frequency radio was used. The Library is now trying to determine more precisely the health benefits from the experimental service.

Hawaii

Permission to operate a terminal in the American Pacific on Saipan was granted in April 1973. That terminal has been used for consultations between the Director of the Trust Territories' Department of Health Services and the University of Hawaii, the Library's contractor for the project. The major product of the contract will be a series of reports: a survey of available library facilities in the U. S. Pacific to support medical activ-

ities; a study of existing communications links in the American Pacific; and a study of medical and health facilities in that area. Information from these reports can be incorporated into a model for a demonstration satellite network in the U. S. Pacific at a later date.

The University of Hawaii space station is also being used regularly by the National Institute of Allergy and Infectious Diseases for regular consultations with their Field Unit in Hawaii. The NIH-ATS satellite transmitter/receiver, located in NLM, is used regularly to exchange research findings and provide consultation with Hawaii via the ATS-1. A telephone hookup makes it possible for the Institute's personnel on the NIH campus to communicate with Hawaii from their offices. The system is proving to be far more reliable and useful than the NIH shortwave radio system previously used.

ATS-F Experimental Program

In April 1974, NASA is scheduled to launch the sixth in the series of Application Technology Satellites—ATS-F. Biomedical communication experiments utilizing ATS-F will be conducted to evaluate the cost-effective use of inexpensive satellite earth terminals in health care facilities and medical educational institutions without the need for trained communications technicians.

During the development phase of the experiment, the Lister Hill Center sponsored a project to develop engineering models of satellite earth terminals which could be used with the ATS-F satellite. This project, completed in early 1973, proved the ability of present day technology to produce reliable, low cost equipment in the 2.5 GHz frequency band, approved by the World Administrative Radio Conference for health and education broadcast services.

The ATS-F biomedical experimental program is a continuation of the ATS-1 experiments with the addition of video, data, and physiological information transfer. The experiments developed for the ATS-F project will focus mainly on supporting an advanced health care delivery system for remote and

isolated villages and cities and on educating medical and paramedical students not located at health-science education institutions.

Computer-Assisted Instruction

The Lister Hill Center is making selected computer-assisted instruction (CAI) available on a limited experimental basis through the same communications network and terminals used for MEDLINE. The experiment is designed to evaluate the transferability and utility of these educational techniques on campuses other than where they originated. The goals of the first year were to connect three contributing computer centers to the communications network, to establish institutional users on both a trial and operational basis, and to ascertain whether or not the available materials would be effectively used.

In July 1972, Massachusetts General Hospital joined the communications network. The programs from the hospital teach "problem-solving" skills through diagnostic simulations. These diagnostic simulations are primarily written for medical students and cover such areas as coma, abdominal pain, jaundice, cardiopulmonary resuscitation, pediatric cough and fever, and hypertensive emergencies.

Ohio State University College of Medicine joined the network in September 1972. Its material divides into two sections. One contains over 70 short teaching units for a variety of health care personnel. The other comprises the CAI part of the Independent Study Program, which covers the entire basic sciences section of medical school. Both sections are supplemented with slides shown on a rear-screen projector next to the terminal.

The third computer center to link to the network was the University of Illinois Medical Center in Chicago, in December 1972. The programs there offer simulated clinical encounters which allow free vocabulary entry and an interactive file of multiple choice questions divided by specialty and subspecialty.

In April 1973, there were 53 "trial" and 11 "operational" users of the CAI Experimental Network. These users represent medical

schools, hospitals, and other organizations interested in biomedical education. Trial users receive two months free trial and report to the Lister Hill Center on their use and evaluation of the systems. Operational users have extended access to the materials in return for the development and evaluation of instructional units. By the end of the year these 64 institutions used 11,000 hours on the network, representing approximately 28,000 student encounters with the educational materials. About 70 percent of the Network's current use is by medical students. The remainder of the time is used primarily by physicians, nurses, and allied health personnel.

The goals of the first year have been met and the use has exceeded the Center's original estimates. As the experiment enters its second year, more attention will be given to the problems of evaluation and content development and to plans for users to defray a part of the communication cost.

Cable Television

In 1973 the Lister Hill Center awarded a contract to the Department of Community Medicine of the Mount Sinai School of Medicine, New York City, to explore the application of communication technology for health information programming to a selected geriatric population in a large apartment complex of East Harlem.



A resident of the Gaylord White House, site of a cable TV experiment supported by the Lister Hill Center.

There is a real need for health care providers to learn how to communicate with the elderly. Operating on the assumption that television is probably the most important communications medium in the lives of the elderly, a cable television system with two-way capabilities will be used to establish bidirectional communication. By disseminating health information via television, coordinated with delivery of health care, the Department of Community Medicine hopes to improve the health status (emotional, physical, and social) of the apartment residents.

Present plans call for:

- The installation of a bidirectional cable television in each of the 248 apartment units at the test site.
- Activating a presently unused channel in the UHF spectrum for the exclusive use of this project.

- The production of health-related programming for the channel with maximum involvement of the tenant group.
- The monitoring of resident viewing and behavior patterns.

Future Directions

Three problem areas where communications technology can make substantial contributions towards solutions of problems in health education and health care were identified by a study conducted by the Lister Hill Center in 1973. These areas are: (1) better utilization of widely scattered health care resources, including consumer education concerning health services; (2) training and educating health professionals; and (3) sustaining and updating the competence of health professionals.

VIII. INTERNATIONAL ACTIVITIES

The National Library of Medicine's international activities which vary in scope, mechanism and immediate objective, all share the common criterion that they be of demonstrated value to the United States.

Exchange Program

The Library currently has 895 partners in 88 countries for acquiring materials through exchange. This list includes the People's Republic of China (PRC) for the first time since 1966. In October 1972, the first group of physicians from the People's Republic of China visited the United States and included NLM on their itinerary. Dr. Wu Wei-jan, the Vice Chairman of the Association of Surgery, All-China Medical Association, and Deputy Chief of Surgery of the Capital Hospital of the Chinese Academy of Medical Sciences, headed the Delegation; Mr. Fu Yi-cheng, Deputy Secretary General of the All-China Medical Association, was the Deputy Head of the Delegation. U.S. physicians accompanying the group included Dr. E. Grey Dimond, Provost for Health Sciences at the University of Missouri, Kansas City, and Dr. Victor Sidel, chief of the Department of Social Medicine, Montefiore Hospital and Medical Center, Bronx, and professor of community health, Albert Einstein College of Medicine, Bronx, who were among the first U.S. physicians to be invited to the PRC.

During the discussions the Chinese delegation indicated publication of Chinese medical journals would be resumed. January 1973 saw the first issue of the new publication, *The Chinese Medical Journal*. This publication contains anonymous substantive articles in Chinese with English language abstracts. Additional publications are now being issued from the People's Republic of China, and the Library is initiating an exchange program for them.

NLM Agreement With Agency For International Development

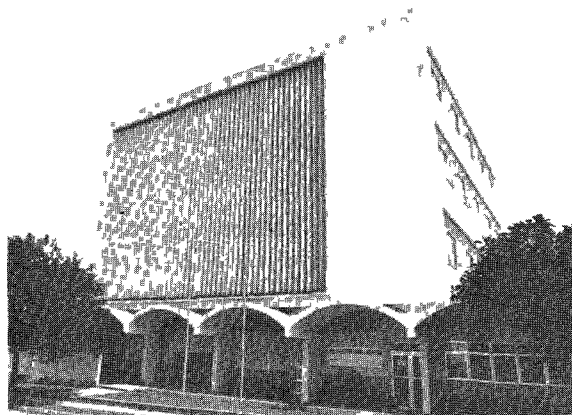
The NLM continues to work with the U.S. Agency for International Development (AID). Under an AID Agreement, the NLM is able to serve medical institutions and individuals in developing countries. These services meet a demonstrated need for those countries where modern medical information is unavailable due to inadequate library facilities, collection, and staff. During the past year approximately 19,000 services were provided to 48 developing countries. These services include interlibrary loans, computer searches, reference questions, audiovisual loans, and subscriptions to some of NLM's publications. The broad geographic distribution of services is: Latin America, 9,450; Near East, 8,000; Far East, 800; Africa, 450. Subject coverage may include all aspects of health care, medical research, education and practice. Broad topics of special interest are nutrition, population studies, and communicable diseases.

Pan American Health Organization

Latin America has consistently been responsible for over 50 percent of the international requests NLM has received for services. NLM has been cooperating with the Pan American Health Organization (PAHO) in its efforts to improve biomedical communications. In 1969, PAHO established a Regional Library of Medicine (BIREME) in Sao Paulo, Brazil. The NLM provides technical consultation and backstopping to PAHO and BIREME. BIREME currently provides over 50,000 services annually within Brazil and is now beginning to increase its activities to other Latin countries. New activities being initiated include an extensive training program for users, managers, librarians, and technicians; an audiovisual

program; and an experiment to operate the MEDLINE data base for the provision of bibliographic services.

In August 1972, the Ministers of Health of the Latin American countries passed a resolution for the development of a Pan American scientific documentation and information network. This undertaking would require: greatly increased regional cooperation with a lessening of national autonomy; resource allocation by governments; the resolution of problems relating to medical libraries such as strengthening basic collections and training; increased awareness of the value of biomedical communications on the part of the medical community; and improvements in the mechanisms for information transfer such as transportation, postal service, and telecommunications. To move toward the development of such a Pan American network, PAHO is beginning to examine the interrelationships of BIREME with other Latin American countries and to encourage the establishment of national centers responsible for providing biomedical information. These



The Pan American Health Organization Regional Library of Medicine in Sao Paulo, Brazil.

would then form the interacting elements with BIREME.

MEDLARS Cooperation

The eight bilateral agreements which NLM has concerning MEDLARS with the United Kingdom, Sweden, France, Germany, Japan, Australia, Canada, and the World Health Organization continue to function well. The

Table 14. Non-U.S. MEDLARS Centers

Country	Operational Period						
	1966	67	68	69	70	71	72
AUSTRALIA							
CANADA							
FRANCE							
GERMANY							
JAPAN							
SWEDEN							
U. K.							
WHO							

As of 1973, there are eight non-U.S. MEDLARS Centers, six of which have been in operation for three or more years. Before assuming direct operations in 1970, France (1967-69) and Germany (1968-69) provided services by utilizing U.K. and Swedish resources.

operational period for the centers varies from 2 to 8 years (Table 14). Under these agreements, NLM provides computer tapes, documentation, and training in return for indexing input of 12,000–15,000 articles annually per center. Planning is under way to determine the mechanism and conditions under which MEDLINE will be made available to all Foreign Centers. Sweden has the MEDLINE data base under an additional special *quid-pro-quo* basis and is providing services to Scandinavia. Under an experimental arrangement, the Institut National de la Santé et de la Recherche Médicale (INSERM) is using a Tymshare node in Paris to access the NLM computer for MEDLINE services. A detailed technical session will be held late in 1973 on these matters with Directors of the Foreign Centers. This will be followed by a second International MEDLARS Policy Meeting. At the time, policy matters will be discussed which will include the availability of MEDLARS II and MEDLINE, and other data bases currently operated by the Library such as TOXLINE and SERLINE; networking; technical cooperation and coordination; and elimination of duplicative intellectual effort.

Public Law 480 Program

The Library's Special Foreign Currency Program, authorized by PL 480, supported 137 scientific projects in seven countries during FY 1973, 41 of which were new awards. This program extends NLM's capability to organize and disseminate information important to the progress of medicine and public health through the use of foreign scientific personnel and resources. Sixty-nine projects were active in Israel in FY 1973 and 44 in Poland under the Library's grants in those countries.

Included among these projects are the preparation of critical reviews of biomedical research and practice; the translation and publication of significant current and historical monographs in the biomedical sciences; publication of major international symposia and conference proceedings; and

publication of authoritative bibliographies and other literature tools in special public health fields.

Examples of new projects activated in FY 1973 are a monograph of physiological and psychological aspects of night and shift work, a study of salivary gland tumors, a monograph on the disorders of homeostasis in surgery, and a review of the mode of action and the chemotherapy of viral infection of man.

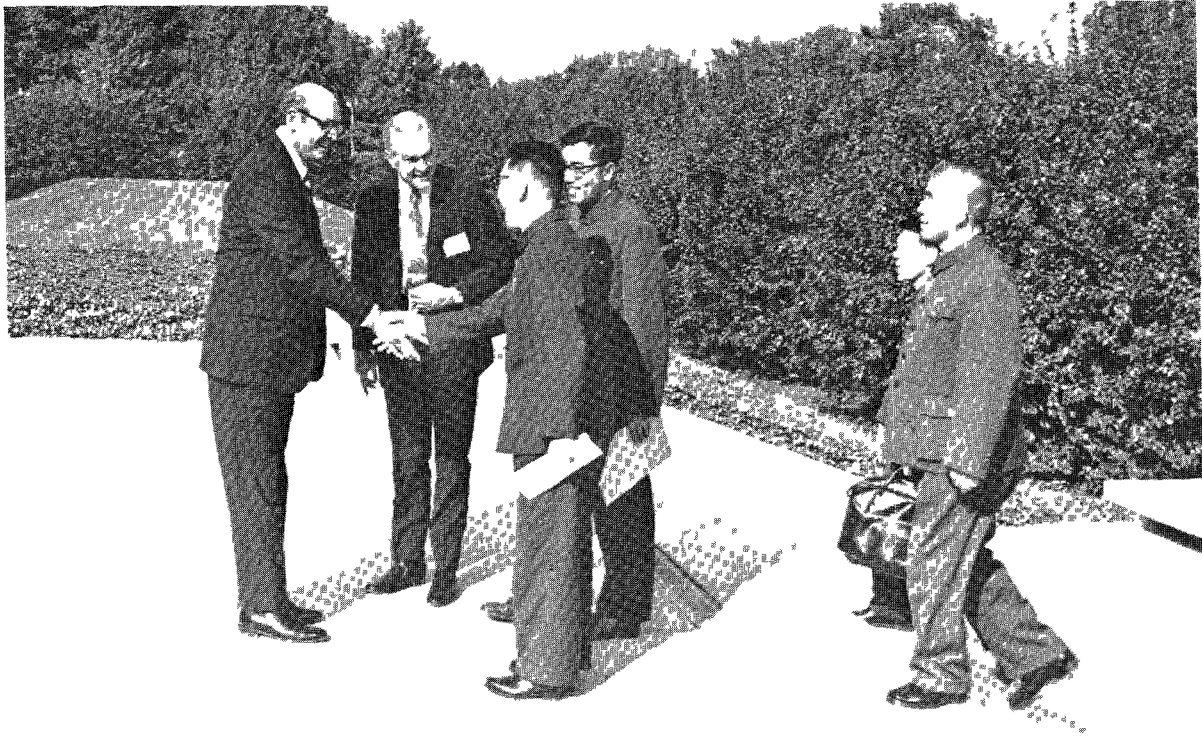
In FY 1973, 14 studies were published under PL 480 auspices, including ten critical reviews, one project in the history of medicine, two conference proceedings, and one scientific research guide. Representative of the 14 studies were: A book-length study on *Modern Concepts in Hematology*, representing findings of the International Committee for Standardization in Hematology (Israel); a monograph on *Surgical Lung Disease in Childhood* (Poland); and a monograph on *Purulent and Fibrous Mediastinitis Radiological Diagnosis* (Poland).

International Organizations

NLM has varying degrees of involvement with a number of international organizations, both governmental and non-governmental, scientific and non-scientific in character. These include the United Nations; the UN specialized agencies which have a health or scientific orientation such as the World Health Organization and the United Nations Education, Scientific and Cultural Organization; economic organizations such as the Organization for Economic Cooperation and Development; and scientific agencies such as the International Council of Scientific Unions Abstracting Board.

Foreign Visitors

During FY 1973, the NLM received about 225 foreign visitors, both as individuals and as members of official delegations for whom special programs were arranged. Included in the latter were several Soviet delegations under the US/USSR Agreement on Cooperation in the Field of Medical Science and Public Health. The first, in August 1972, was headed



NLM Director (left) and former National Institutes of Health Director Robert Q. Marston, M.D., welcome Dr. Wu Wei-jan and his delegation of physicians and scientists from the People's Republic of China.

by Dr. Boris V. Petrovsky, Minister of Health. Minister Petrovsky's visit initiated arrangements for a subsequent visit of Professor Yuriy P. Lisitsyn, Director of the All-Union Research Institute for Medical and Medical-Technical Information during FY 1974.

Other special delegations included the Minister of Health, Dr. Marian Sliwinski, of Poland, Deans of Brazilian Medical Schools, information science specialists from the Republic of China, the People's Republic of China, and study groups from France, Germany, Japan, and Spain.

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