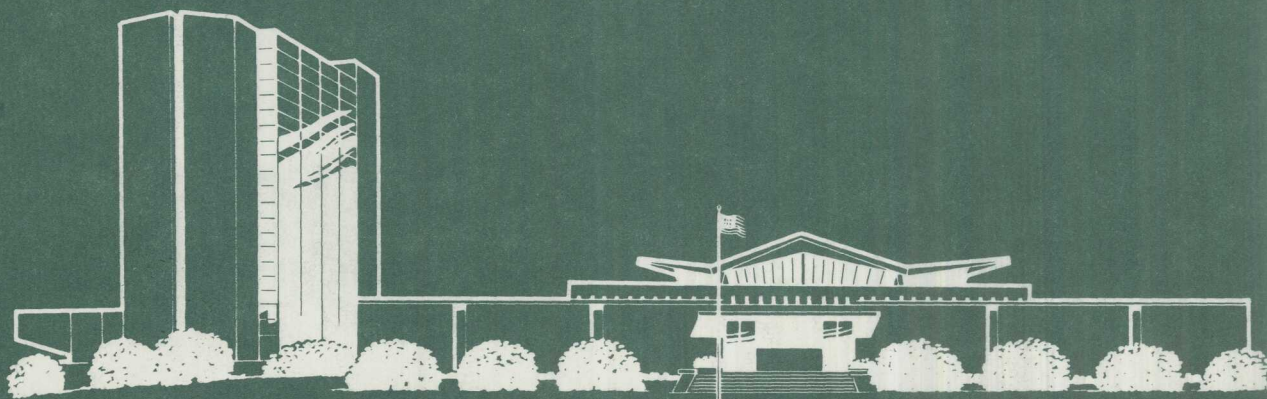


THE NATIONAL LIBRARY of MEDICINE

PROGRAMS
and
SERVICES

Fiscal Year 1982



NATIONAL LIBRARY of MEDICINE
PROGRAMS and SERVICES

Fiscal Year 1982

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
National Institutes of Health

National Library of Medicine
Bethesda, Maryland

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Preface


At the beginning of Fiscal Year 1982, the Library noted the 10th anniversary of the inauguration of MEDLINE Online access by a few institutions to a database of 130,000 references was begun in October 1971. In the intervening decade this modest network has expanded to some 1,800 U.S. institutions at which more than 2 million searches are being conducted annually on a series of databases containing more than 4 million references. These MEDLARS databases, collectively, and the online network through which access is provided, constitute the world's largest scientific bibliographic retrieval system.

Among the highlights of FY 1982 that are described in this report:

- The completion of two Congressional studies of MEDLARS;
- The installation of new MEDLARS computers; and
- A major reconfiguration of the Regional Medical Library network.

I am also pleased to announce that at the end of FY 1982 *A History of the National Library of Medicine: The Nation's Treasury of Medical Knowledge* was published. The result of many years of research by Wyndham D. Miles, Ph.D., of the History of Medicine Division, it is a comprehensive chronicle of the evolution of this institution from a shelf of books for Army medical officers to an international resource of biomedical literature. The story is one in which the American medical community can take pride.

As usual, none of the accomplishments noted throughout this report could have taken place without a competent and dedicated staff. We were also assisted by the careful and critical reviews made by our Board of Regents and the Board of Scientific Counselors.



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

POLICY AND DIRECTION

Kenneth G. Carney
Executive Officer

Board of Regents

At all three of its meetings in FY 1982, the NLM Board of Regents discussed at length the complex issues involved in the pricing of NLM computerized products and services: domestic and foreign use; online use versus leasing of tapes; commercial and nonprofit use. The Board (October 30, 1981) adopted a resolution recommending that there be no differential pricing structure for different categories of online users. At the same meeting, the Board reviewed NLM's international bilateral quid pro quo MEDLARS arrangements and passed a resolution endorsing the basic concept of these arrangements while making certain modifications in the way they are implemented. At the meeting on May 20, 1982, the Regents adopted a policy defining the cost elements and charging formula for pricing NLM online services. Among other important issues considered by the Regents in FY 1982 were: the plans to integrate the Lister Hill Center and the National Medical Audiovisual Center; the development of MEDLARS III; the reconfiguration of the Regional Medical Library network; and the computers-in-medicine grant program.

Four new Regents were appointed in FY 1981: L. Thompson Bowles, M.D., Ph.D., Dean for Academic Affairs and Professor of Surgery at the George Washington University; Lois E. DeBakey, Ph.D., Professor of Scientific Communication at the Baylor College of Medicine; Charles C. Edwards, M.D., President of the Scripps Clinic and Research Foundation; and David O. Moline, D.D.S., of the Salem Dental Group in Salem, Oregon. William D. Mayer, M.D. was elected Chairman of the Board for 1982-83.

MEDLARS Studies

Two studies of the policies and practices of NLM in making available MEDLARS services were issued by the Congress in FY 1982. The first was "NLM's Medical Literature Analysis and Retrieval System," HRD-82-66, conducted by the General Accounting Office and released in April 1982. Although the report made several recommendations to modify NLM's proce-

dures to recover costs from non-health related users, it concluded that "NLM's pricing policy establishing user charges to recover those costs associated with accessing the MEDLARS data bases appears consistent with existing statutes and regulations. In addition, the methods NLM used to identify MEDLARS-related costs and determine its user charges seem reasonable."

The second study, issued in September 1982, was "MEDLARS and Health Information Policy: A Technical Memorandum," conducted by the Office of Technology Assessment. This more extensive report (150 pages) is also generally supportive of MEDLARS and NLM's policies in providing its services to the health-science community. Among its findings are that NLM's pricing policies are consistent with existing laws and regulations, that NLM's data bases do not duplicate others available in the private sector, that NLM's pricing policies have not impaired the growth of the commercial information industry, and that, in summary, MEDLARS is "warranted by NLM's extensive collection of biomedical materials, by its legislative mandate, and on economic grounds."

Two other studies are pertinent to this subject. The National Commission on Libraries and Information Science published a report, "Public Sector/Private Sector Interaction in Providing Information Services," that surveyed the topic broadly and enunciated a series of principles to guide the future roles of the two sectors. Also, the Department of Health and Human Services is conducting a study of NLM's policies with regard to the provision of services in response to requirements of the Paperwork Reduction Act. The Department's report will be issued in September 1983.

Financial Resources

For FY 1982, the NLM had a total appropriation of \$45,035,000. This amount includes a supplemental appropriation received in September to offset pay raise costs. Table 1 displays the FY 1982 NLM budget, including reimbursements collected from other agencies.

The Department of Health and Human Services (DHHS) will begin FY 1983 operating under a continuing resolution. The resolution provides DHHS with funds through December 17, 1982 and thus will allow time for the Congress to complete action on appropriations for the fiscal year. On an annual basis, the continuing resolution provides NLM with \$45,035,000, the same amount as FY 1982.

lency (FTE) personnel system in which ceiling is based on "work years," not, as in the past, on the number of employees onboard at the end of the year. Under this new system in FY 1982 NLM utilized 469 FTE's of its allotted full-time permanent ceiling of 485 (table 2). This system provides an incentive to managers to improve the management of personnel resources and to utilize part-time employees when appropriate.

Personnel

NLM is now operating under a Full Time Equiva-

There is a plan for a reorganization to merge the Lister Hill National Center for Biomedical Communications (LHNCBC) with the National Medical Audio-

Table 1
Financial Resources and Allocations
FY 1982
(in thousands of dollars)

Amounts available for obligation	
Appropriation, NLM	\$45,035
Plus: Reimbursements	1,287
Total	46,322
Amounts obligated	
Medical Library Assistance Act	7,588
Intramural Programs and Services	33,838
Library Operations	(15,138)
Office of Computer and Communications Systems	(6,800)
Lister Hill National Center for Biomedical Communications	(5,203)
National Medical Audiovisual Center	(3,191)
Specialized Information Services	(3,506)
Direct Operations	1,566
Program Management	3,330
Total	46,322

Table 2
Personnel Staffing, FY 1982
Full-Time Permanent FTE's

Program	FY 1982*
Office of the Director	16
Office of Inquiries and Publications Management	4
Office of Administration	41
Office of Computer and Communications Systems	54
Extramural Programs	18
Lister Hill National Center for Biomedical Communications	40
Specialized Information Services	26
National Medical Audiovisual Center	48
Library Operations	222
Total	469

*Actual use

Policy and Direction

visual Center (NMAC). When approved by the Office of the Secretary, DHHS, and after the approval is granted, the reorganization and reassignments of personnel will be announced and the new functional statements published in the Federal Register.

Staffing Activities. *John Anderson* was appointed Director of Information Systems, NLM. Mr. Anderson has held the position of Head, MEDLARS III task force.

Duane Arenales was appointed Acting Regional Medical Library Coordinator.

Dennis Benson was appointed as an Expert with the Computer Technology Branch, Lister Hill Center. Mr. Benson previously held an Intergovernmental Personnel Act (IPA) position with LHNCBC.

Dennis Black was appointed Contract Officer, NLM. Mr. Black previously served as a Supervisory Contract Specialist with the Division of Administrative Services, NIH. Mr. Black succeeded *Norman Osinski* who was selected for a policy position in the Office of the Assistant Secretary for Health.

Lois Ann Colaiani was appointed Acting Associate Director for Library Operations. Currently the Deputy Associate Director for Library Operations, Ms. Colaiani is acting for *Dr. Joseph Leiter* who has been appointed a Special Assistant to the Director, NLM.

William G. Cooper, Ph.D., was appointed Acting Director for the Lister Hill Center and the National Medical Audiovisual Center. Dr. Cooper has held the position of Associate Director for Planning, NLM since 1980.

Stella A. Graves was appointed Personnel Officer, NLM. Mrs. Graves has been with NLM since 1980 and previously was a Personnel Management Specialist. Mrs. Graves succeeded *Thomas Reed* who was selected for the position of Administrative Officer for the Clinical Center, NIH.

B. Earl Henderson was appointed Acting Deputy Director for the Lister Hill Center.

Joseph Leiter, Ph.D., was appointed Special Assistant to the Director, NLM. Dr. Leiter had held the position of Associate Director for Library Operations.

Karen Patrias was selected as Head, Reference Section, Reference Services Division. Ms. Patrias was previously a Supervisory Librarian with the NIH Library. Ms. Patrias succeeded *Phyllis Mirsky*.

Stanley Phillips was selected as Deputy Executive Officer, NLM. Mr. Phillips was formerly with the Health Resources Administration. Mr. Phillips succeeded *Kenneth Cooke* who was selected for the position of Executive Officer in the National Eye Institute.

Peri Schuyler was selected as Deputy Chief,

Bibliographic Services Division. Mrs. Schuyler has been with the Division since 1972. Mrs. Schuyler succeeded *Richard Dick*.

George Thoma, Ph.D., was appointed Acting Chief, Communications Engineering Branch, Lister Hill Center.

Awards. NIH Merit Awards for 1982 were presented to *John Blake*, Ph.D., Division of Library Operations; *John Cox*, Office of Computer and Communications Systems; *Carol Ditzler*, Division of Library Operations; *Jerry Edge*, Division of Specialized Information Services; and *Roy Standing*, Lister Hill Center.

Frieda Weise received the NLM Director's Award in recognition of the outstanding manner in which she has exemplified the Library's mission of contributing to the medical literature and expanding and improving the dissemination of biomedical information.

Mary E. Corning, D.Sc., received an Honorary Doctorate of Science degree from Mount Holyoke College in Massachusetts. Dr. Corning is the Assistant Director for International Programs, NLM.

Equal Employment Opportunity

The FY 1982 Equal Employment Opportunity Advisory Committee (EEO) focused its attention on the Career Ladder Training Program initiated by NLM in 1980. The program was established in order to augment existing career ladder opportunities by providing a limited number of developmental positions for NLM employees. The Committee this year began an evaluation of the program to determine if objectives were being met successfully. The Educational Research and Evaluation Branch, National Medical Audiovisual Center, working with the EEO Committee, conducted the evaluation.

In addition, the Committee distributed a revised Affirmative Action Plan which identified new policies on recruitment, education and training, and management of the EEO Program at NLM. This new plan will be discussed in management meetings throughout the organization in the months ahead with the hope of building a realistic understanding of the principles of a viable Affirmative Action Plan, responsive to the needs of all NLM employees in a time of government restrictions and cutbacks.

Modernization of the Building

The construction of the National Library of Medicine building was completed in 1962. Although the facility is still relatively young, the past 20 years have brought many rapid changes in Library activities and the present building is now inadequate to meet these needs.

Congress, recognizing the serious problem of overcrowding of the Library, appropriated funds for the Lister Hill Center building "to restore space in the NLM to its originally intended use."

From the outset of this renovation project, it was apparent that the modifications would involve major redesign of NLM to accommodate more efficient levels of operation while creating a safe, pleasant and effective work setting. Systems furniture was designed for specific Library functions to aid in processing material and to conserve as much space as possible. Included in the renovation project is the installation of a new and more efficient fire protection system to provide security for the NLM's priceless collection and safety of the public and staff.

The contract to modernize the Library was awarded in 1981 with a completion anticipated in mid-1983.

Lobby Exhibits

The first exhibit in the lobby in FY 1982, "The Evolution of Anatomic Illustration," was a carryover from last year. The next exhibit, also assembled by the staff of the History of Medicine Division, was "The

History of Medical History in the United States." It opened on April 12, and ran through the end of the fiscal year.

This exhibit traced the development of the history of medicine in the United States as a medical specialty, as an avocation, and as a scholarly pursuit, from 1769 to the present. Featuring books and photographs from NLM's collections, together with pictorial and archival material on loan from other institutions, the exhibit illustrated the rise of museums, professional societies, journals, and teaching departments devoted to the history of medicine. Considerable attention was devoted to such physicians as Oliver Wendell Holmes and William Osler who, as avid collectors of rare books, made possible the creation of excellent libraries in many American medical societies and schools.

The exhibit was timed to coincide with the annual meeting of the American Association for the History of Medicine (April 26-May 1) in Bethesda. The NLM was one of three host institutions. In addition to viewing the exhibit, the members of the Association were shown the new NLM-produced film, "The Palpable Osler."

LIBRARY SERVICES AND OPERATIONS

Lois Ann Colaianni

Acting Associate Director, Library Operations

Library Operations, the largest NLM component, selects, acquires, catalogs, indexes, provides access to, and disseminates the information in NLM's collections. Library Operations has four operating divisions—Bibliographic Services, History of Medicine, Reference Services, and Technical Services; Medical Subject Headings (MeSH) Section; and the Regional Medical Library Program. Each is discussed in this part of the report.

The MEDLARS III activities, formerly reported in this section of the report, were administratively transferred in March to the Office of Information Systems and will be discussed in that chapter. However, extensive liaison continues between Library Operations and the MEDLARS III Team and some activities reported in this chapter relate directly to MEDLARS III development.

Two of the key indicators of the quality and level of service are requests for interlibrary loans and reader service. In FY 1982 the number of interlibrary loan requests received declined from 237,000 in FY 1981 to 227,000; however the number of requests filled increased slightly. The fulfillment rate for lending original materials was 83 percent and the rate for photocopies was 89 percent. About 90 percent of the loans for original materials and 83 percent of the requests filled with photocopies were sent out in four days. See Table 7 for circulation figures.

A public-access, online catalog was planned as the long term alternative to the card catalog which was closed in January 1981. This year a study was conducted comparing two prototype online catalog systems developed at NLM, CITE (Current Information Transfer in English), and ILS (Integrated Library System). NLM patrons and staff participated in the study using one or both systems and completing questionnaires designed to elicit data upon which to compare the systems' features.

The number of NLM authoritative cataloging records available through CATLINE increased substantially due to a 55 percent reduction in the cataloging backlog and the addition of 106,566 retrospective

records to the file. Cataloging statistics are shown in Table 9. Cooperation with the Library of Congress and the National Agricultural Library expanded in the areas of acquisitions, cataloging-in-publication, and name authority control.

Progress continued on building the National Biomedical Serials Holdings Database. The health science serials holdings of over 800 libraries have been merged into one database. This will be updated and augmented to form the basis for the production of union lists and, eventually, the automated routing of interlibrary loan requests.

Procedures have been developed to reduce the processing time for journal articles to be indexed, revised, keyboarded and input into the databases. The use of the online system has continued to increase (Tables 4, 5). The number of online searches rose from 1,434,539 in FY 1981 to 1,679,952 in FY 1982. The number of offline searches declined three percent to 571,711 searches in FY 1982. Several hypotheses for this decline have been suggested but none has been tested.

Considerable staff effort was spent preparing the request for proposal for the Regional Medical Library Program to define the goals and objectives of the program incorporating the revised mission statement and the reconfigured regions. Upon receiving the proposals from the seven Regions, staff worked with outside reviewers to evaluate the proposals, request clarifications, and provide assistance to the contract specialists throughout the negotiation. The new contracts, while recognizing the regional differences, emphasize the national priority of improving the provision of information to health professions through document delivery, local self-sufficiency, resource sharing, locating resources, improving basic skills of library intermediaries, reference services, etc. An important goal for the next three years is to improve service in underserved areas of the country.

The programs in Library Operations, both those internal to NLM and those that affect other health sciences libraries through the Regional Medical

Library Program, complement each other and work together to provide timely information services to health professionals

Training Programs

In addition to staff development, Library Operations sponsors and participates in several training programs including the NLM Associate Program, Librarian Career Development Program, and NIH library technology training

Associate Program. The NLM Associate Program is a one-year, intensive post-graduate training program for health sciences library/information professionals. It is designed to provide work experience and research opportunities at NLM for outstanding individuals with high leadership potential. The Associate Program has trained 71 librarians in the past 16 years. The five candidates in this year's program were selected from a group of 62 nationwide applicants.

During 1981 the Associate Program underwent a comprehensive review which focused on the program's mission, selection process, curriculum, and evaluation methods. Subsequent to the review, a six-member advisory group was constituted to advise the Associate Director on this program. A broad-based training experience was established involving a ten-member faculty representing all components of NLM. The curriculum was designed to include modularized training units with core and elective topics and is to be carried out through work rotations, classroom instruction, seminars, projects, and field work. The major effects of this comprehensive review are to be implemented for the 1982/83 program, for which four candidates have been selected.

This year the Associates spent two five-month periods on work rotations and individualized projects. Formal coursework, seminars, and field work accounted for the remaining two months. Highlights of the Associates' independent work included 15 projects related to various activities in the Library. Each Associate also participated in a one-week field practicum to study the information resources and services of other organizations. Libraries at universities, medical centers, hospitals, government agencies, and private industry served as hosts for the practicum sessions.

Librarian Career Development Program (LCDP). Library Operations began participating in a two-year Librarian Career Development Program sponsored by NIH. Modeled on the STRIDE Program, the LCDP provides a career opportunity in the library profession by funding a master's level degree program in conjunction with direct training and work experience at NLM.

The LCDP, open to NIH employees on a competitive basis, selected two candidates for the period of June 1981-June 1983. At the end of the program the trainees will be assigned to NLM positions.

NIH Library Technology Training. A library technology training program was started at NLM in 1981. It is funded through the NIH Career Education Center and the training is provided by the University of the District of Columbia. Six academic courses were selected that will lead to a certificate. The courses are:

- Level 1 Introduction to Library/Media Services
Support Operation for Technical Processes
Support Operation for Public Services
- Level 2 Cataloging and Classification
Special Libraries
Administration of Media Systems

Since the fall of 1981 six sessions of Level 1 courses were held with 65 registrants. The 1982 term, which introduced Level 2 courses, began with 36 registrants in three courses. About 30 library employees are enrolled in this training.

Regional Medical Library Program

Network Activities. The Board of Regents, at its October 29-30, 1981, meeting approved both a revised mission statement for the Regional Medical Library (RML) Program and a reconfiguration of the RML network. This is the first major change in geographical boundaries in the program's 14-year history. The mission, which reemphasizes the importance of service to the nation's health professionals, is "to provide health sciences practitioners, investigators, educators, and administrators in the United States with timely, convenient access to health care and biomedical information resources. The program is coordinated by the National Library of Medicine and carried out through a nationwide network of health sciences libraries and information centers."

In order to provide decentralized services and equalize health professionals' access to information, the United States is divided into geographical regions. Within each region, a major medical library—the Regional Medical Library—is under contract to NLM to develop and manage a Regional Services Plan for network libraries to share and improve their resources through cooperative document delivery, online services, acquisitions, and other technical and bibliographic services. Regional Medical Libraries also improve health professionals' access to information by training health science librarians in the skills necessary to provide basic information services, by

providing consultation for institutions whose health information services need improving and by developing groups of institutions into consortia to share their resources.

In addition to the RMLs the Regional Medical Library Network consists of approximately 105 Resource Libraries and more than 3,000 Basic Health Science Libraries, often hospital libraries. The National Library of Medicine provides back-up support for the entire Network which delivered nearly two million interlibrary loans to health professionals in FY 1982.

Network Changes. The reconfiguration of the network from eleven to seven regions dominated RML activities during this fiscal year. The new configuration is designed to take advantage of the existing strong working relationships and programs developed over the past 14 years, while providing a more cost-effective mechanism to meet current and anticipated budget restraints. The reduction will be effected by merging the five Eastern seaboard regions into two larger groupings and combining two existing regions in the Midwest. The Midcontinental, Pacific Northwest, Pacific Southwest and South Central Regions are to remain basically unchanged.

In January NLM issued competitive contract requests for each of the seven new regions. The requests for proposals from institutions interested in serving as RMLs emphasized network management in support of four national goals: (1) provision of a basic level of information service for health professionals; (2) improved service levels at health science libraries; (3) increased sharing of resources and expertise; and (4) promotion of improved methods of information transfer.

From April, when the responses were received, through the end of the fiscal year, technical review groups composed of health professionals, librarians, and NLM staff reviewed proposals and negotiations were conducted. Approximately \$2.5 million is to be awarded to the successful regional libraries to operate RML programs during the coming year. Contracts for services in the current 10 (NLM has functioned as the 11th RML) will end between September 25 and the end of the year and the new RMLs will be phased in over the same period. Two awards were announced in September. The University of Washington was selected as the RML in Region 6, the Pacific Northwest, and the University of California at Los Angeles as the RML in Region 7, the Pacific Southwest. Other awards were to be announced shortly thereafter.

Network Programs. Network service programs con-

tinued strong in all areas despite some uncertainties about reconfiguration. By the end of the fiscal year the transition from Federal to local or user funding of document delivery was virtually complete. In connection with this shift an RML Interlibrary Loan (ILL) Unit Cost Working Group collected data from selected hospital and resource libraries to test a methodology for periodic determination of ILL costs as a basis for establishing the maximum network charge.

All regions strengthened their ability to locate sources for biomedical information by improving regional locator tools, especially for serials. RMLs continued to coordinate the collection of journal holdings from major academic and hospital libraries for input to NLM's National Biomedical Serials Holdings Database. During the summer NLM merged the separate holdings lists into one database and produced the first products—a hardcopy serials locator tool for the Pacific Southwest and a microfiche serials listing for the Kentucky-Ohio-Michigan Region. Locator tools for the remaining regions will follow.

The Midwest Region continued to develop an online union catalog of monographs and the Midcontinental Region to prepare an online catalog of serials. Both regions are implementing automated document request and routing systems based on their online catalogs. At the national level, five central and western RMLs began a six-month test of an improved version of NLM's pilot automated interlibrary loan system, DOCLINE.

UCLA and the University of Nebraska continued to assist NLM in training online search analysts, offering both initial and advanced classes. Abbreviated three-day classes also were offered in all regions except the Pacific Northwest. These classes combined with those offered by NLM provide cost-effective decentralized training for librarians throughout the country.

The Videocassette Loan Program completed a successful year. In this cooperative program NLM's National Medical Audiovisual Center (NMAC) deposited copies of 300 NMAC-produced videocassettes at a selected library in each RML Region. Participating libraries agreed to fill ILL requests for these materials and forward any unfilled requests to NMAC for processing. Although the program is still being evaluated 1,000 ILL requests for these materials were filled during the first six months of the program.

RML Directors met twice in FY 1982—once in the fall at the University of Nebraska in Omaha, and the second time in June in conjunction with the Medical Library Association meeting in Anaheim, CA. The fall meeting included a review of the Midcontinental RML Program and a discussion of reconfiguration, estab-

lishing maximum document delivery fees for the network, locator tool development, and improving the system for requesting document delivery from NLM. The June meeting featured general information on the contract negotiation process, DOCLINE and holdings database updates, and reports from the University of Illinois and the University of Nebraska on the regional automated document delivery systems.

Region IV. The Mid-Atlantic Regional Medical Library, headquartered at NLM, provides biomedical information to health professionals in the District of Columbia, Maryland, North Carolina, Virginia, and West Virginia. This year, in keeping with the regional plan adopted in 1980, special emphasis was placed on resource sharing projects and the basic skills training program.

Greater resource sharing was accomplished through developing union lists and strengthening the interlibrary loan system. Approximately 300 institutions (including 26 military medical libraries) from the region have contributed their holdings for an estimated 7000 titles. Completion is expected by early 1983. The Audiovisual Committee continued its work on developing a union catalog of audiovisual materials. The initial catalog will include bibliographic and classification data for an estimated 10,000 titles from 150 Region IV institutions. There are plans to publish a second edition which will add holdings from Region VI after the two regions are merged in the reconfiguration. An academic health sciences library is working with the Committee to study the feasibility of publishing the list in 1983 on a cost recovery basis.

Statistics for interlibrary loans indicate an increase in the number of requests referred from resource libraries to NLM. In 1979 when a fee system was introduced, it was projected that the number of requests would decrease substantially and remain low for two years. Loan requests declined from 89,517 in 1979 to a low of 63,472 in 1981 and are now increasing as anticipated; 68,044 requests were received this year, an increase of 4572 over last year.

The Online Services Committee contributed regularly to the regional Newsletter with an "Online Hotline" column and has prepared an information packet on the costs involved in setting up a MEDLINE center. Its members have prepared "search hedges" in the areas of epidemiology, geriatrics, immunology, cancer and psychology. The number of online centers in the Region increased by 45, to 336.

The Education Committee assessed the need in each state for basic skills training on a state by state basis. The top five categories in which workshops were requested are:

1. Budgeting for the hospital library
2. Audiovisuals in the hospital library
3. How to write a policy and procedure manual
4. Organization and management of hospital libraries
5. Preparing for hospital accreditation

This year 32 workshops were held, each tailored to the training needs of the individual state. Emphasis was placed on the team teaching concept with local representation on the instructional team to insure the level of instruction was targeted for the audience. Efforts continue to develop a cadre of instructors in each state who are interested and qualified to teach basic library skills and techniques.

A series of meetings with health science libraries in various parts of the region encouraged the development of state health sciences library associations in the District of Columbia, Virginia, West Virginia, and North Carolina. Numerous other meetings were held in Virginia, Maryland and West Virginia to encourage and promote consortia development projects.

Meetings were held with individuals from Region IV and Region VI when they attended NLM's Initial Online Training Classes. This gave these libraries an opportunity to meet the Region IV staff, discuss the regional programs and ask questions about NLM.

Medical Subject Headings Section (MeSH)

The consultants who advise NLM on the selection of literature for *Index Medicus* reviewed and rated 275 journals that were candidates for inclusion in FY 1982. Of these, 71 were accepted for indexing. The consultants also carried out a thorough review of the *Index Medicus* journals concerned with dermatology, ophthalmology, and veterinary medicine. On the basis of the consensus of the consultants, the NLM Director approved a policy of limiting the contents of *Index Medicus* to serial literature.

In order to minimize the amount of relearning required by users, and their need to reconstruct existing stored search strategies, MeSH staff continued the policy of limiting Medical Subject Heading changes to the most essential. For the 1983 MeSH, 129 headings were added; of these, 98 are entirely new and 31 replace deleted headings. An additional 92 obsolete or rarely used headings were deleted without replacement. The added terms represent a wide variety of subjects without emphasis on any particular subject area. About 4200 chemical entities encountered in the indexed literature were added to the chemical subfile of MeSH. This subfile was extensively edited in anticipation of the production of a publicly available printed version.

Several new features were added to the 1983 printed edition of MeSH as a convenience to users, including an indication of the descriptors for which pre-explosions are available online, and a list of the 1983 changes in the hierarchical "trees."

Bibliographic Services

The Bibliographic Services Division (BSD) is responsible for indexing the biomedical literature for *Index Medicus*, entering the citations into the databases, and coordinating the training and use of NLM's online network.

High standards for indexing were maintained while BSD staff developed and implemented procedures to reduce the processing time of *Index Medicus* journals. BSD also coordinated the development of standardized testing routines to ensure the reliability of yearly database maintenance operations.

Indexing. A total of 282,950 citations were added to the various NLM databases in FY 1982 (Table 3). An analysis of this figure showed that 259,874 citations appeared in *Index Medicus*, 15,872 were entered for special recurring bibliographies, 5,654 were for the *Hospital Literature Index* and the associated HEALTH PLANNING & ADMINISTRATION database, and 1,550 citations were printed in the *Index to Audiovisual Serials in the Health Sciences*.

Work continued on developing an in-house online indexing capability. The general design for this system known as the Automated Indexing and Management System (AIMS) was completed and the detailed design effort was begun. The system is expected to be in operation in mid-FY 1983.

While efforts continued toward the development of the AIMS, two improvements were made to the present manual system in order to increase the speed with which journals are processed and citations entered into the database. The first, centralized control of journal distribution, produces a more efficient routing of journals through the indexing, revision, and keyboarding processes and results in a shorter time lag

between receipt of journals at NLM and appearance of their citations in the databases. This plan was implemented for high priority journals in late FY 1982. Initial analysis of this control plan shows that throughput time for priority one journals has been reduced by 50%.

The second improvement resulted from the creation of an experimental automated tracking file. The file provides management control for all journals through the indexing, revision, and keyboarding processes. The file permits the locating of a journal anywhere within the processing flow, identifying bottlenecks, and monitoring journals that remain at any point in the flow beyond a specified length of time. The file is used to generate daily management workload reports of and to assist in the assignment and routing of journals to Index Section staff. Its use has improved the speed with which citations from journals are prepared for inclusion in *Index Medicus* and MEDLINE. The basic features of this file are being integrated into the Automated Indexing and Management System.

Several actions were taken to improve the consistency of indexing and the accuracy of database input. Twenty-three Technical Memoranda and two Technical Notes were prepared and distributed to all indexers and five additional automated input-edit validations were installed. A total of 98 automated validations are now performed at the time of input and/or editing. This reduces the staff time necessary for editing and improves the quality of the printed and online products.

Staff also prepared a draft guide for selecting and indexing proceedings of congresses, meetings, and symposia that appear in the journal literature, wrote the annual Indexing Orientation syllabus, updated the 1983 MeSH Tree Annotations, prepared the 1983 addenda to the Indexing Manual, and created and input annotations for 557 MeSH terms.

During the year a study was conducted comparing the availability of chemicals in CHEMLINE and in the MESH VOCABULARY file. Analysis of users' searches

Table 3.
Bibliographic Services

Services	FY 1979	FY 1980	FY 1981	FY 1982
Total items indexed*	254,210	266,730	279,105	282,950
· For <i>Index Medicus</i>	230,427	243,873	256,112	259,874
Recurring bibliographies	28	27	24	25
Journals indexed for <i>Index Medicus</i>	2,595	2,661	2,664	2,697
Abstracts entered	98,501	111,629	126,742	124,511

*Includes special list articles, audiotapes, and Health Administration citations.

indicated that approximately 45 percent of the chemicals searched were available in the MeSH file, while about 75 percent were available in CHEMLINE. The results show that despite the significantly smaller size of the MeSH file (34,000 records compared to over 500,000 records in CHEMLINE), it offers a reasonable chance of success for locating chemical information for MEDLINE searches.

MEDLARS Management. The NLM online user network began its eleventh year in October 1981. The MEDLARS Management Section is the public's contact point in the daily operation of the network. The staff of the Section answered telephone and written inquiries about the various databases, maintained billing records, processed applications for access to the network, mailed offline and offsearch prints, produced manuals and other descriptive materials, and coordinated training in the use of the online MEDLARS systems. (Tables 4 and 5 show the numbers of online and offline searches, respectively, from FY 1980 to FY 1982).

Effective October 1, 1981, evening hours of computer service were expanded to 9:00 p.m. ET Monday through Friday on the NLM computer or the backup computer at the State University of New York at Albany (SUNY). The NLM computer was also made available from 8:30 a.m. to 5:00 p.m. ET on Saturdays. At the same time, a new procedure was implemented permitting access to the NLM computer to those users who normally access databases at SUNY on Saturdays and when SUNY is unavailable for more than thirty minutes.

A revised NLM Educational Access Program became effective in February 1982. This program provided MEDLARS access codes at nonprime time rates to domestic institutions of higher education, professional schools, or societies that incorporate instruction on online retrieval systems in regularly scheduled courses. For this specialized use institutions can provide computer experience to students while paying the least expensive connect time rates regardless of the time of computer access.

The number of domestic and foreign online serv-

Table 4.
Online Services

<i>Online Databases</i>	<i>FY 1980</i>	<i>FY 1981</i>	<i>FY 1982</i>
AVLINE	17,656	20,397	18,376
BIOETHICS	3,426	3,762	3,409
CANCERLIT	41,795	41,457	42,365
CANCERPROJ	5,002	3,700	3,270
CATLINE	208,639	191,314	224,559
CHEMLINE	59,767	55,039	46,375
CLINPROT	1,558	1,825	1,753
EPILEPSYLINE	2,511	2,448	1,607
HEALTH	46,971	61,564	70,735
HISTLINE	3,291	3,652	3,978
MEDLINE	682,802	741,632	784,625
MED79	---	---	118,877
MED77	---	105,822	144,185
MESH VOCABULARY	6,582	19,044	19,016
NAME AUTHORITY	5,406	7,219	10,618
POPLINE	---	11,616	16,483
RTECS	12,537	14,747	14,761
SDILINE	18,978	17,551	17,770
SERLINE	37,197	37,645	44,916
STORED SEARCH	101	115	176
TDB (TOXICOLOGY DATA BANK)	9,820	14,243	14,466
TOXLINE	86,333	77,135	68,768
TOXBACK74	---	2,612	8,864
TOTAL	1,250,372	1,434,539	1,679,952

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Table 5.
Offline Searches

Databases	FY 1980	FY 1981	FY 1982
AVLINE	29	21	33
BIOETHICS	13	35	6
CANCERLIT	3,778	6,026	5,385
CANCERPROJ	276	173	40
CATLINE	247	141	145
CHEMLINE	43	84	18
CLINPROT	11	6	6
EPILEPSYLINE	28	7	7
HEALTH	547	902	3,285
HISTLINE	5	7	11
MEDLINE	45,828	45,779	36,666
MED79	---	---	44,817
MED77	83,202	83,864	63,267
MED75	106,358	94,975	72,616
MED72	78,593	70,523	56,646
MED69	62,269	56,409	42,094
MED66	44,187	40,346	30,374
MESH VOCABULARY	0	7	18
NAME AUTHORITY	44	0	1
POPLINE	---	765	2,208
RTECS	134	257	296
SDILINE	108,978	147,109	178,774
SERLINE	17	15	27
TDB (TOXICOLOGY DATA BANK)	99	185	238
TOXLINE	17,208	22,409	21,798
TOXBACK*	8,424	---	---
TOXBACK74	578	8,919	6,204
TOXBACK65	545	8,578	6,731
TOTAL	561,441	587,542	571,711

*TOXBACK was divided into two new TOXLINE backfiles (TOXBACK74 and TOXBACK65) in September 1980.

ices users increased to 2,679 in FY 1982. NLM and staff at Regional Medical Libraries held 40 classes with 783 individuals receiving initial or advanced online services training. Classes were held in Dallas, Chicago, Philadelphia, Detroit, New York, Boston, Atlanta, Omaha, and Los Angeles in addition to those in the Washington area.

Highlights of MEDLARS database changes in FY 1982 included: AACR2 cataloging changes to CATLINE and AVLINE, CANCERLIT file regeneration to include Medical Subject Headings on records entered after 1979, and the enhancement of POPLINE with data from Princeton University's publication, *Population Index*. Changes to the NLM Automatic SDI Program (a monthly current awareness service) resulted in expansion to include service for the HEALTH PLANNING AND ADMINISTRATION database, the capability to sort printed cita-

tions, and the capability for users to specify various print formats not previously available in the program.

There are twenty-five Recurring Bibliographies currently in production that provide citations from the MEDLARS system in printed formats. The most recent, *Bibliography of Acute Diarrheal Diseases*, began publication in 1981. It is published semi-annually in cooperation with the World Health Organization. The first issue included citations input to the MEDLINE database from July through December 1981.

Some of NLM's online databases continue to be available domestically through agreements with two commercial database vendors. Both DIALOG Information Services and Bibliographic Retrieval Services (BRS) offer MEDLINE and its backfiles and the HEALTH PLANNING & ADMINISTRATION database. In May 1982, the British Library (BLAISE) discontinued mounting

MEDLARS databases on its own computer in England. With the cooperation of the National Library of Medicine, users in the United Kingdom began directly accessing the NLM computer via the new BLAISE service, BLAISE-LINK.

The 1982 revision of the NLM *Online Services Reference Manual* became available during the summer. This revision contains a Mini-Manual for ready reference; information concerning AACR2 changes to CATLINE, AVLINE and the NAME AUTHORITY FILE; MeSH headings in CANCERLIT, the regeneration of TOXLINE, and the addition of pre-1965 records in CATLINE. A copy of the manual was mailed to each MEDLARS access code holder. Additional copies are available from the National Technical Information Service.

History of Medicine

As in the past years, the History of Medicine Division has continued to serve the public by making the rich resources of its varied collections available for scholarly research and publication, and by disseminating information on the field through its bibliographic and other publications.

During the year the historical resources of the Library were enlarged by the addition of some 248 books, 92,000 manuscript items, and 475 prints and photographs (see Table 6). The books ranged from sixteenth century editions of various works by Galen and a rare treatise on urology by Giustiniano Arcella printed in 1568 to the first English translation (1902) of the work on gastric secretion for which Pavlov was awarded a Nobel Prize in 1904. Among the rare eight-

eenth century items added were Dominique Anel, *Suite de la nouvelle methode de guerir les fistules lacrimales* (Turin, 1714), which supplements Anel's original classic publication on this subject, and four theses defended in 1781 and 1782 by the famous cardiologist Jean Nicolas Corvisart in the course of obtaining the M.D. degree at the University of Paris. One early manuscript was added, an ophthalmological treatise by Sadaqa ibn Ibrahim al-Misri al-Hanafi al-Shadhili (floruit 14th century), which has been praised by George Sarton as "remarkable for its comprehensiveness and relative originality." The text apparently remains unpublished. Additions to the modern manuscripts collection included additional oral history interviews relating to the history of the Food and Drug Administration, further papers from Dr. William B. Bean, and the papers of Emanuel Libman, among others.

In order to make its holdings more widely known and available, the Division has continued its traditional cataloging program and started preparations to enter its existing records for pre-1801 publications into the Library's computerized database, CATLINE. Looking toward a more distant future, the Division has cooperated actively with its counterparts at the Library of Congress in the development of supplementary manuals for Chapter 4 (manuscripts) and Chapter 8 (graphic materials) of the *Anglo-American Cataloguing Rules* (2nd edition) which should facilitate eventual automation of records for the manuscripts and the prints and photographs collections. The Division prepared and published the annual *Bibliography of*

Table 6.
History of Medicine Activities

	FY 1980	FY 1981	FY 1982
Acquisitions			
Books	329	290	248
Modern manuscripts	51,651	133,423	91,953
Prints and photographs	479	570	475
Processing			
Titles cataloged	2,709	2,870	3,028
Modern manuscripts cataloged	46,603	47,750	53,100
Pictures indexed	33	150	420
Articles indexed	5,266	4,863	4,498
Pages microfilmed	92,938	120,944	103,869
Public Services			
Reference questions answered	2,107	2,287	2,421
ILL and pay orders filled	2,596	2,244	2,515
Reader requests filled	4,551	6,348	5,903
Pictures supplied	2,151	1,913	2,427

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the *History of Medicine* and added corresponding citations to the HISTLINE database.

Staff members have also contributed to medical historical studies by presenting the results of their research at professional meetings and institutions. Dr. James H. Cassedy was elected president of the American Association for the History of Medicine at its annual meeting in April.

Reference Services

The Reference Services Division is the Library's principal public service component for the provision of reader, reference, and bibliographic services and interlibrary loans, and is responsible for maintaining and preserving the General Collection.

Requests for interlibrary loans dropped slightly again this year, while reference inquiries and the demand for material from the General Collection for use in the Reading Room increased (tables 7 and 8).

The Name Card Catalog was compressed, releas-

ing the space occupied by one case in the Catalog Area to permit installation of a centralized staff area for providing reference assistance and for use of the newly installed online catalog computer terminals. This area, just inside the main entrance to the Library, includes CATLINE and MEDLINE terminals, microfilm readers containing listings of both monographs and serials, and two Reference Information Desks. CITE (Current Information Transfer in English) and ILS (Integrated Library System), two user-friendly online search systems, were offered for public use beginning in April. A comparative study is under way to evaluate the merits of each system.

DOCLINE (Document Delivery Online), a prototype file for controlling interlibrary loan traffic, was used to monitor the processing and circulation of materials loaned in the original form and for the preparation of computer-produced overdue notices. The system also generates management information reports and, with minor modifications, can be used in the future to in-

**Table 7.
Circulation Statistics**

<i>Activity</i>	<i>FY 1980</i>	<i>FY 1981</i>	<i>FY 1982</i>
Requests received:	434,533	415,315	411,343
For interlibrary loan	242,077	236,837	226,991
For readers	192,456	178,478	184,352
Requests filled:	341,433	327,160	332,356
For interlibrary loan	179,770	175,454	175,657
Photocopy	163,830	161,017	163,078
Original	15,940	14,437	12,579
For readers	161,663	151,706	156,699
Requests unfilled:	93,100	88,155	78,987
Interlibrary loan	62,307	61,383	51,334
Rejected	22,000	24,399	22,588
Referred	8,217	4,413	1,652
Returned as unavailable	32,090	32,571	27,094
Reader Service			
Returned as unavailable	30,793	26,772	27,653

**Table 8.
Reference Services**

<i>Service</i>	<i>FY 1980</i>	<i>FY 1981</i>	<i>FY 1982</i>
Requests by telephone	11,102	12,399	12,886
Requests by mail	389	427	301
Readers assisted	31,614	30,957	37,297
Total	43,105	43,783	50,484
Reading Room users registered	28,710	25,407	22,078

dicating trends and forecast traffic patterns. Five Regional Medical Libraries began using and testing the system for referring interlibrary loan requests to NLM. This is a pilot project intended to evaluate the initial phase of an expanded DOCLINE network.

Some 35 new titles were added to the Literature Search list of printed bibliographies prepared by the Reference Section. Over 80,000 of these searches were distributed to individuals and institutions. One new title was added to the Reference Information Series. This Series is composed of publications for distribution to Reading Room patrons to introduce those unfamiliar with various subjects to general information sources in the field that are available at NLM. The most recent addition, *Dentistry: a guide to sources of information*, brings to eleven the total titles in the Series.

Plans were formulated for a system which would bridge the gap between the book on the shelf and the bibliographic data describing the book which exists in the computer data base. A label on each book, identifying individual items in the collection will eliminate labor-intensive tasks of shelf-reading and certain functions in the circulation process. Much effort was devoted to preparation of a Request for Proposal and evaluation of proposals for the attachment of Machine Readable Identifiers (MRI) in the form of bar codes, principally to the monograph collection. This project will lay the foundation for automated inventory control and circulation under MEDLARS enhancement now under way.

The major work in renovating the Library building took place on the three stack levels. The Circulation and Control Section showed commendable patience, good humor, and a positive attitude and maintained high levels of service to on-site patrons in the Reading Room and the world at large through interlibrary loan despite drilling through concrete, workmen, and dust and debris. During the entire year, there were only brief suspensions of service to the Reading Room due to spray painting of the ceiling over the stacks.

Technical Services

The Technical Services Division selects, acquires, and catalogs all post-1870 literature added to the Library's collection. Materials acquired include books, serials, and audiovisual programs in the health sciences. The Division is also responsible for the distribution of authoritative cataloging data for biomedical materials and for the collection, organization, and dissemination of serials locator and holdings data for biomedical libraries throughout the United States.

During FY 1982, the Technical Services Division

concentrated on improving the creation and distribution of bibliographic data and expanding significantly the body of authoritative NLM cataloging records available to the field. The Division made steady progress toward the elimination of NLM's cataloging backlog of foreign language materials and older English language monographs; continued work on major data conversion and collection activities essential to an enhanced MEDLARS system; expanded areas of cooperation with the Library of Congress (LC) and the National Agricultural Library; and modified some of the special processing services received from book dealers and subscription agents in order to eliminate duplicate receipts from vendors and provide better receipt records. New Division initiatives included the implementation of direct online input of cataloging records by NLM catalogers and a plan for review and revision of the *Scope and Coverage Manual of the National Library of Medicine*. By the end of FY 1982, the Division had filled several long standing vacancies and was close to full staffing levels for the first time in several years.

FY 1982 was the first full year of application of the revised system for assigning materials to full or limited cataloging based on language, age, and subject matter and also the first full year of expanded use of contract support for cataloging foreign language monographs and older materials. As a result of these new procedures, the total number of new cataloging records released to CATLINE during the year increased to 22,852, about double the number added to CATLINE in FY 1981. During FY 1982 the cataloging backlog of foreign language and older English language material was reduced from 17,366 to 7,798 items. The long term prognosis for cataloging production improved considerably when four cataloger vacancies were filled and the Library embarked on new cooperative ventures with LC and other institutions such as the Central Medical Library in Finland. LC has offered the services of its New Delhi office to provide descriptive cataloging and a brief content summary of each of NLM's acquisitions in Indian languages. The Central Medical Library has agreed to supply NLM with copies of its cataloging records for Finnish language items which NLM has acquired. NLM staff will transcribe records received from these sources for input to CATLINE.

A new effort to improve productivity and decrease the overall throughput time for addition of records to CATLINE and AVLINE is the development of a transitional system for direct online input of authority and bibliographic records by catalogers. This system will be used until major MEDLARS enhancements permit catalogers to use automated in-process control

**Table 9.
Cataloging Statistics**

Item	FY 1980	FY 1981	FY 1982
Completed cataloging			
Full	14,352	11,203	10,800
Limited	2,286	2,468	16,190
Total	16,638	13,671	26,990

records as the basis for full cataloging records. The initial phase of the transitional system, known as the front-end cataloging system, was implemented in March 1982, when catalogers began online input of all authority records. The second phase, which covers online input of bibliographic records, began for audiovisual catalogers in July 1982 and will be extended to all monograph and serial catalogers in early FY 1983.

NLM continues to contribute name authority records to the LC authority file as part of the Name Authority Cooperation (NACO) project. At present, NLM contributes headings for its serial cataloging records and pre-1870 materials. NLM and LC are discussing methods for automatic transfer of data from NLM's Name Authority File to LC's file, which would permit expanded NLM contribution to the NACO project.

The implementation of AACR2 in January 1981 necessitated extensive changes to the formats of CATLINE, AVLINE, NLM cataloging publications, and NLM's MARC distribution tapes. By the end of FY 1982 all cataloging products contained properly formatted AACR2 data. With the availability of properly tagged AACR2 data on NLM's MARC distribution tapes, the Research Libraries Information Network (RLIN) became a CATLINE tape subscriber, which should lead to even broader availability of NLM's cataloging records.

AACR2 changes to existing files and publications delayed production of new microfiche cataloging

publications scheduled for FY 1982. The first of these, the 1976-1980 cumulation of the *National Library of Medicine Current Catalog*, will appear in early FY 1983.

Beginning in 1982, an audiovisuals section was added to the *National Library of Medicine Current Catalog Proof Sheets*; this new section is intended to assist media acquisitions in health sciences libraries.

In addition to efforts to improve the availability of current cataloging records, FY 1982 saw a steady growth in the number of retrospective cataloging records added to CATLINE. More than 100,000 retrospective cataloging records were added to CATLINE during the year, bringing the total of pre-1965 records in the file to about 223,000. By the end of FY 1983, CATLINE will contain about 550,000 cataloging records covering essentially all printed monographs and serials in the NLM collection. The file will then provide a particularly rich resource for scholars in the history of medicine. Retrospective records will be published in COM format and also will be distributed on MARC tapes.

The present *Scope and Coverage Manual of the National Library of Medicine* was published in May 1977. In FY 1982, the Division initiated a re-examination of the manual which should result in the publication of a new edition in FY 1984. In addition to many NLM staff, a liaison from the NLM Board of Regents and outside consultants will participate in the review.

NLM will continue to coordinate its collection

**Table 10.
Acquisitions Statistics**

Acquisitions	FY 1980	FY 1981	FY 1982
Current serial titles received	22,753	23,364	23,694
Publications processed			
Serial pieces	179,089	174,585	146,708
Other	22,299	20,267	22,342
Total	201,388	194,852	169,050
Obligations (\$) for			
Publications	1,650,000	1,809,993	2,261,000
Included for Rare Books	51,000	70,408	60,000

policy with the policies of LC and NAL. During 1982, LC further curtailed its retention of technical works in the field of clinical medicine. This change in policy resulted in the transfer of some 1500 volumes of medical serials from LC to NLM to fill gaps in the NLM collection. It also led to a 40% increase in the number of current medical monographs routinely sent to NLM by LC.

The Division continues to refine and enhance its special dealer processing arrangements. Two U.S. book dealers now routinely search and update NLM's monograph in process file (INPROC) before supplying books on approval. Their use of the system has cut the number of duplicate copies of books received by NLM substantially and also reduces the NLM staff time required to process the books when they are received. In April 1982, two subscription agents who participate in the off-site check-in program began to enter data on issues they supply online into NLM's Master Serials System. The other dealers who perform off-site check-in for NLM continue to send machine readable issue data on tape for batch loading at the

Library. As of June 1982, NLM is capturing and storing machine readable data for all serial issues received by the library. All issues not supplied by off-site check-in dealers are now checked in online by NLM staff. Although the online check-in mechanism used will be altered significantly to improve its efficiency, the availability of machine readable data for all received issues already is assisting interlibrary loan and reference activities and has streamlined serial claiming procedures.

The development and use of the National Biomedical Serials Holdings Data Base also advanced during FY 1982. At the end of the fiscal year, the data base included about half a million holdings statements collected from 888 libraries throughout the United States. Sample regional union lists were generated in (COM) format for the eleven current regions in the Regional Medical Library Network. In FY 1983, regular procedures for updating and generating products from the holdings data base will be established with the Regional Medical Libraries in the reconfigured network.

Table 11.
Growth of Collections

<i>Collection</i>	<i>Previous Total (Sept. 1981)</i>	<i>Added in FY 1982</i>	<i>New Total</i>
<i>Book materials</i>			
<i>Monographs:</i>			
Before 1500	567	0	567
1501-1600	5,583	29	5,612
1601-1700	9,812	34	9,846
1701-1800	23,524	120	23,644
1801-1870	39,496	25	39,521
Americana	2,300	13	2,313
1871-Present	414,017	22,382	436,399
Theses HMD	281,548	18	281,566
Pamphlets	172,021	—	172,021
Bound serial volumes	657,456	28,538	685,994
Volumes withdrawn	(26,282*)	(302)	(26,584)
Total volumes	1,580,042	50,857	1,630,899
<i>Nonbook materials</i>			
<i>Microforms:</i>			
Reels of microfilm	31,799	1,479	33,278
Number of microfiche	86,809	18,375	105,184
Total microforms	118,608	19,854	138,462
Audiovisuals	38,127	1,645	39,772
Pictures	73,844	475	74,319
Manuscripts	1,068,993	91,953	1,160,946

*This figure includes all volumes previously listed in the "Brief-listed INPROC" category. These volumes were either removed from the collection altogether or will appear in the "Monographs: 1871-Present" category as they are given full or limited cataloging.

OFFICE OF INFORMATION SYSTEMS

John Anderson
Director

MEDLARS III

During FY 1982 the MEDLARS III Design Team has concentrated on the preparation of a Request for Proposal (RFP) to be issued to the private commercial sector as an invitation for competitive bidding. While this RFP was originally scheduled to be released to the public during April, delay in obtaining the necessary administrative approvals has caused some slippage. The revised schedule calls for an October 1982 date for release of the RFP, with an anticipated award of contract in May 1983.

The preparation of the Request for Proposal has centered on the development of detailed specifications that will guide the design and implementation of MEDLARS III. These specifications are divided into three broad categories.

- Technical specifications, which address the technical aspects of the computer system, such as system architecture and global system capabilities.
- Application specifications, which focus on the library-specific elements of the system, e.g., support for acquisition, cataloging, indexing, circulation and collection control, and interlibrary loan routing and control.
- User facilities specifications, which describe the MEDLARS III retrieval language and capabilities, and other user-oriented features of the system.

The total MEDLARS III development cycle is expected to require three years following contract award. In order to provide maximum control by NLM over the contractor, MEDLARS III is being divided into three separate contracts. This will allow for a phased implementation of capabilities and provide a measure of flexibility in subsequent contracts. The three phases are currently planned to consist of the following activities:

Phase I—Implementation of: (1) basic system-wide software centered on a Data Base Management System; (2) the nucleus of an in-

formation retrieval system; and (3) initial application software to support the selection and acquisition function.

Phase II—Extend the library processing application to incorporate the primary bibliographic control components: cataloging, indexing, and authority control.

Phase III—Development of the interlibrary loan routing and control system, along with activities to manage the collection.

Also during FY 1982, MEDLARS III initiated several interim system developments to bring about more immediate improvements in bibliographic processing. The first of these, front-end cataloging, has been completed. Front-end cataloging will enable catalogers to input catalog data directly online. The second interim project, front-end indexing, is currently in the design stage. This project, which will enable indexers to index journal articles online, is expected to be operational by January 1983. A third project is an improved automated interlibrary loan capability, scheduled for completion in June 1983.

Computer and Communications Systems

The Office of Computer and Communications Systems (OCCS) provides data processing and data communications support for all elements of the Library. It has a critical supporting role for Library Operations as well as Specialized Information Services. Computer analysts and programmers work closely with subject area specialists to determine their data processing requirements and to convert these requirements into new or improved data processing capabilities. OCCS provides systems and programming support for the MEDLARS II system and is responsible for those capabilities providing the transition to the MEDLARS III system. Support for all of NLM's production data processing is provided by OCCS on an IBM 3033 multi-processor system and Data General 230 and 350 minicomputer systems.

Equipment. In early 1982 NLM reviewed its project requirements for data processing equipment to support its ongoing workload and the development of MEDLARS III. This requirements analysis indicated that additional computer capacity was required to meet these needs over the next five-year period. Therefore, a competitive procurement was conducted to upgrade the IBM 370/168 system. This competitive procurement resulted in the purchase of an IBM 3033 multi-processor system and its installation in August and September 1982. NLM was able to acquire the system for one-third of the equipment commercial list price by use of this competitive process. The new system has twice the processing capacity of the previous system and will meet the Library's requirements through 1987.

For the past ten years, the State University of New York at Albany (SUNY) has supported NLM's online retrieval services with supplemental backup and workload capacity. With the upgrade to the new computer system this year, NLM is now in a position to shoulder the full workload of the online bibliographic service. Therefore, the use of SUNY was reviewed and NLM decided to bring all of the workload into the Library. This transition is planned to be completed over the first three months of FY 1983. During the ten-year period of cooperation with SUNY, it has provided excellent support to the Library.

Considerable emphasis has been placed on taking advantage of the capacity of the new 3033 system: additional disk storage and storage control units were installed and the new equipment provides improved data and program security, improved programmer and user productivity, a graphics capability for use throughout NLM, and improved access to the TELENET and TYMNET communications services.

During FY 1982 the Systems Support Branch provided all required support for NLM mainframe operating systems and related software, provided training in the use of systems software, and resolved user reported problems and inquiries. Notable activities of the Systems Support Branch during FY 1982 include:

- Installation and maintenance of systems software packages—MVS/SP, the current version of the IBM operating system that provides support for the planned 3380 disk storage units as well as increased system reliability and performance.
- Installation of the spool transfer program which improves systems availability by providing the capability to transport printer output between computer systems and the Interactive Output Facility (IOF) which improves user services by providing the ability for users to view printer output at their terminal.

- Installation of CICS (Customer Information Control System) and the Series/1 protocol converter. The increased emphasis of the use of computer terminals by NLM professional staff to improve staff productivity required an improved method of providing computer services. CICS provides control for data base/data communications (DB/DC) applications and will be one of the critical building blocks for MEDLARS III. The protocol converter provides the ability for ASCII terminals—those used throughout NLM—to use the vast library of 3270 applications and services available on the 3033 system.
- Pascal, a new higher level language, was installed for use by the MEDLARS III team for evaluation purposes.

In addition to systems support, the following user services and training were provided:

- Basic TSO training was provided to 32 users.
- Advanced TSO training was provided to 43 users.
- 250 user assistance requests and/or problem reports were satisfied.
- The Users Guide to OCCS was revised three times to reflect changes in available computer services.
- 300 TSO user access codes were added to the system.

Bibliographic Retrieval. Much of the MEDLARS support effort provided by the MEDLARS Support Branch is not directly visible to the users of NLM services. Quality and quality control are taken for granted. In 1982, significant changes to the MEDLARS system were implemented in citation processing, expansion of the MeSH vocabulary, completion of the expansion of CATLINE with the addition of retrospective (prior to 1965) records, and the accommodation of AACR2 standards.

MEDLINE and its backfiles were updated to reflect the new 1983 vocabulary. Both MeSH and chemical terms were updated. A new citation file was created for BIOETHICS.

The TOXLINE database was extensively rebuilt, with some 300,000 citations moved to a new backfile and the current file reworked to accommodate changed input from the Chemical Abstracting Service (CAS). CHEMLINE was rebuilt and adjusted in midyear to align CAS registry pointers to the proper TOXLINE file.

Major international standards changes in Anglo-American Cataloging Rules, Version 2 (AACR2) required complete revision of the input and update procedures and programs (MEDIEM, MEDCFM, and MEDNAM) along with a rebuilding of the CATLINE and AVLINE files.

The new data elements and changes to prior data structures resulted in extensive reworking of the weekly and monthly catalog publications and the programs that generate MARC formatted tapes for distribution. Retrospective catalog data were successfully added in the new AACR2 format. Also, records were converted, accepted, and added to the online files from the new Front End Cataloging procedure. The Public Access Catalog Study was supported by assisting LHC in building a retrieval file for the Integrated Library System, and assisting SIS in the online environment specifications.

A fourth generation online application development tool, ACT/1, was selected and acquired for interactive system development. Using "live" citation data, OCCS demonstrated the data flow linkage from an IBM 3279 terminal through ACT/1 and program logic into an INQUIRE DBMS file and back again. ACT/1 has been used to develop sets of user screens for indexers, revisers, and contractor editors and is being used in MEDLARS III initial capabilities development.

Major changes to the CATLINE database and all supporting processing programs were implemented to accommodate AACR2. The Name Authority input process (MEDNAM) was expanded to accommodate many more concurrent users, and CATLINE was expanded by over 50% to hold retrospective records (which will continue to be added). Security measures were added to all input programs so online users are limited to the elements they can modify in the online file. Internal documentation was generated for year-end processing and recurring file regeneration.

Significant resources were devoted to the National Cancer Institute database processing, including a tutorial training session for one of their contractors. The CANCERLIT database was enhanced by the addition of MeSH terms. This major enhancement was accomplished over an extended period of time and required close coordination between NCI, its contractors, and OCCS.

INQUIRE Activities. INQUIRE is the Data Base Management System (DBMS) software used to provide management and automation support throughout many areas within the NLM. The User Language is a significant component of this software and is used by more than 200 staff members in addition to OCCS computer personnel support staff. The Applications Support Branch provides continuing support to the software, its databases and resultant applications as well as development of new applications. Some of these developments include:

- MRI (machine readable identifier) Data Base: in support of Library Operations in the generation,

tracking, and management of the application of bar code labels on the NLM collection;

- Summary Holdings Data Base: in support of Library Operations in the collection and management of summary holdings statements, integrating these with the Master Serials System, and the production of regional union lists. Regional union lists are now being prepared and distributed on microfiche.
- Miscellaneous databases to support development of management reports and statistics.

The major INQUIRE enhancement which became operational this year is the generalized full screen processor and data dictionary. A prototype of this system was installed at NLM in FY 1981. This year use of full screen processing came into its own and it is now being used for a number of INQUIRE applications.

Data Communications. The principal data communications activities during this fiscal year included: (1) planning for the extension of the broadband coaxial cable to the Library building; (2) continued development of the coaxial cable local area network for the Library and the Lister Hill Center buildings; and (3) enhancements to the data communications services.

Refinements were made to the communications capabilities in the new computer facility. Capabilities such as microprocessor-based flow control devices were developed which permit devices to operate at speeds lower than the communications circuit. The port contention and switching device was upgraded to include additional ports and thereby increase the sharing of resources.

New software and hardware were installed for the TYMNET and TELENET network connections. These upgrades will permit an increase in concurrent users, provide a more efficient access method, and permit the coexistence of TELENET and TYMNET in the same communications controller.

Local Area Network: Significant progress has been made in the implementation of the NLM's Local Area Network (LAN). NLM procured Bus Interface Units (BIUs) for four Federal agencies: NLM; Tri-Medical (Army, Navy, USAF)—Information Services (TRIMIS); NASA-Lewis Research Center; and Wilford Hall (USAF). The BIUs will be used to interconnect a variety of CRT terminals, word processing systems, printers, and microcomputers to many host computer ports via a broadband coaxial network. Delivery of the units began in the first quarter of FY 1982.

Several user related capabilities were developed: (1) a print server nucleus which will permit resource sharing of printers on the LAN and (2) a prototype

Local Area Network Directory (LAND) which will provide user assistance on network connections and host services.

Implementation began on the software based on the standard for interfacing packet networks. This standard protocol will provide: (1) a gateway from the LAN to public networks; (2) asynchronous access for large numbers of users; (3) dial-in access to the LAN; and (4) out-dialing to non-LAN host computers. This design permits terminal-to-terminal, terminal-to-computer, and computer-to-computer communications via the LAN to remote hosts/terminals.

Operational testing of the LAN began in November 1981 on the pilot cable plant in the Lister Hill Center building. The LAN became operational for a limited number of users after the installation of the main cable plant was completed in May 1982. The system will be extended to the main library building as the renovation of each floor is completed.

Computer Operations. The Government has an important program to assure the effective utilization of funds by contracting out those services which can be

done more economically by the private sector. As part of this program, the Computer Operations Section, i.e., that section which is responsible for operating all of the NLM computer systems, is the subject of an A-76 Evaluation Study. The results of this study will determine whether this function should be placed under contract or continued to be performed by Government employees. The evaluation is a major undertaking of the Library and was initiated over one and one-half years ago. The OMB Circular A-76 for the Operations Section was finalized during this fiscal year. Extensive drafts were completed and approved by all parties concerned. Briefings were given and questions answered. Over 80 potential contractors requested copies of the RFP and a tour was scheduled and given for all interested potential contractors. This is the first such document produced for a technical area under OMB Circular A-76 and it has already become the standard or sample document within the Department. Several other agencies have also requested a copy of the document for efforts in their own areas. Responses to the RFP are due early in FY 1983.

SPECIALIZED INFORMATION SERVICES

Henry M. Kissman, Ph.D.
Associate Director

This is the 15th year since the Toxicology Information Program (TIP), which is the major responsibility of the Library's Division of Specialized Information Services (SIS), was established in 1967. This occurred in response to recommendations made in the 1966 report, "Handling of Toxicological Information," prepared by the President's Science Advisory Committee. The general objectives of TIP are: (1) the creation of computerized toxicology data bases from the scientific literature and from the files of collaborating industries, academic institutions, and Government agencies; and (2) the provision of toxicology information products and services to the scientific community. These services consist of a variety of online information retrieval services, query response services, and several publications.

Project Management System

During the course of this fiscal year, a new SIS Project Management System (PMS) was gradually implemented. It is based on a modified matrix management concept to meet the unique needs of the Division. Under the PMS, projects are identified and staff is assigned to project teams according to their expertise and experience. Project teams usually meet on a scheduled basis, with senior staff free to attend as ad hoc members. Team leaders are required to prepare brief reports of their meetings and to contribute to the SIS monthly report.

An integral part of the PMS is planning and review. A planning and evaluation group has been established to provide support in this area to the Office of the Associate Director for SIS. This group also provides a planning link to the NLM Director through the Associate Director for Planning.

An important feature of this new management system is a computerized Management Information System (MIS) using the Model 204 software. The MIS receives weekly data from staff members, who report actual hours spent on each project task, subtask, or other activity. The project leaders provide information on milestones, project tasks and subtasks, and

staff assignments. The MIS will have the capability of tracking "issues" and their resolution. Although the MIS is still under development, most of the files required for the system have now been established and data from the various projects are being gathered.

A number of important benefits of the PMS are becoming apparent: projects have been organized in terms of objectives and milestones, staff responsibility has been fixed and project assignments clarified, and there is better staff utilization.

A Compound Monitoring System, to track chemicals of interest to SIS, is also being implemented. This computerized system will contain a base record for each chemical and sub-records on its status within the chemical/toxicological files, as well as the availability of documentation concerning the compound.

This report will focus on the projects identified in the matrix of the new Project Management System. Some of these projects are relatively new and there is little to report except that they have been initiated in the past year. Other projects are much older, utilize many SIS resources, and claim accomplishments.

CITE (Current Information Transfer in English)

The CITE Project Team developed a "user-friendly" prototype which provides a natural language search interface to NLM's computerized book catalog file (CATLINE). The CITE/CATLINE online catalog enables walk-in patrons of the Library to find books of interest by performing their own searches at a computer terminal. An evaluation study of this prototype was conducted during the summer of 1982.

CSIN (Chemical Substances Information Network)

SIS continues to collaborate with the Environmental Protection Agency (EPA) to develop the prototype CSIN system. In November 1981, SIS hosted the training of the first users of the prototype. The SIS staff also monitors the CSIN interface to NLM online databases.

In order to make the benefits of CSIN technology available to a wider audience, a study was initiated under a jointly-funded contract with Bolt Beranek and Newman (BBN), to determine if CSIN software could be implemented in microcomputers. Based on this study, further contract efforts were initiated in FY 1982 to begin the conversion of the prototype CSIN software to a microcomputer version.

Hazardous Substances Information Services

This is a new activity, initiated in 1982, to provide health-related information support to the Department of Health and Human Services (DHHS) in meeting its responsibilities under the Comprehensive Environmental Response, Compensation, and Liabilities Act of 1980 (CERCLA), also referred to as the "Superfund Law." The NLM signed an interagency agreement with the Centers for Disease Control, the lead agency for DHHS in this area, on July 15, 1982, to establish and develop the Hazardous Substances Information Services. The objective is to develop a capability for the efficient delivery of toxicology and related information to health officials responsible for assessing the hazards from chemicals present in waste disposal sites or major accidental spills.

One approach to achieving this is to enhance existing databases and make them as complete as possible with factual data on hazardous chemicals. To do this in the most cost-efficient manner, existing NLM databases, particularly the Toxicology Data Bank (TDB), are being augmented with new chemicals and new data categories of relevance to hazardous substances in spills or disposal site clean-up.

Another component of these services is to provide information support to the newly formed Hazardous Waste Information Evaluation Subcommittee of the DHHS Committee to Coordinate Environmental and Related Programs. This subcommittee will be advisory to the National Toxicology Program on toxicity testing of hazardous waste chemicals and to the NLM on database development.

During 1982, emphasis was placed on expanding the TDB with data on known hazardous chemicals. About 175 new records on chemicals relevant to the hazardous substances area were added to TDB (see p. 23). In 1983, these services will expand to include supplementing TDB or other databases with new data categories of importance to hazardous chemical responses, and the development of an information delivery system for the field.

Information Support to the National Toxicology Program (NTP)

The NLM/NTP project team continued its support

functions, including the preparation of tables and indexes to the two sections of the *FY 1982 NTP Annual Plan*; updating and maintaining the NTP Chemical Registry System; and providing systems analysis and assistance to NTP in the development of the NTP Management Information System.

Among the new activities initiated in FY 1982 for NTP were the public distribution of the *NTP Chemical Registry Handbook* via the National Technical Information Service, and the estimation of toxicity (based on structure-activity relationships) for about 200 NTP chemicals. Work was begun on the preparation of a master list of possible carcinogens. A computerized chemical name sorting program—NLM-CHEM-SORT—was developed and successfully applied to lists of chemicals in the tables and indexes of NTP publications.

Query Response Activities

Query response and literature search services in toxicology are provided both by SIS and through the NLM-sponsored Toxicology Information Response Center (TIRC) at the Oak Ridge National Laboratory. Within the framework of the new SIS Management Information System, an enhanced query response activity was introduced. Staff continued to monitor TIRC's activities, reports, procedures, and interagency agreements. A reporting procedure for all query responses and searches processed by the SIS staff was instituted. In six months, 324 queries and 817 requests for information about SIS products and services were handled by SIS staff.

All TIRC products and services are delivered to users on a cost-recovery basis. Fees for searches and custom bibliographies provided by TIRC are billed through the National Technical Information Service (NTIS). TIRC offers literature search services to users at \$30 per hour (\$35 for foreign users). During FY 1982, TIRC completed 657 information searches. This compares with 525 searches for FY 1981—a 25% increase.

One special user of TIRC's literature search services is the Interagency Information Response to Chemical Concerns (IRCC) Project, sponsored by the DHHS Committee to Coordinate Environmental and Related Programs and several agencies. The primary objective of the IRCC project is to provide the sponsoring organizations with "express" literature searches (48-hour turnaround) on demand. A secondary objective is to prepare comprehensive bibliographies on topics selected by the IRCC Project committee as being of general concern to the sponsoring agencies.

Publications

In 1980, NLM negotiated an agreement with the Federation of American Societies for Experimental Biology for printing and promoting IRCC Project-sponsored bibliographies. Two more of these publications become available in 1982 under this agreement. They are:

- The Effects of Environmental Chemicals on the Immune System, a Selected Bibliography with Abstracts, 1969-80.
- The Health Effects of Environmental Chemicals on the Adult Human Reproductive System, a Selected Bibliography with Abstracts, 1963-81.

Tox-Tips (Toxicology Testing-in-Progress) is produced by SIS for the DHHS Committee to Coordinate Environmental and Related Programs (CCERP). This publication reports primarily on new toxicity tests under way by the Government, industry, and academic laboratories. It also describes epidemiologic studies of chemicals to determine toxic effects and briefly reports on publications concerning new methods of testing chemicals for biological effects. The quick publication of information on new testing programs is intended to minimize duplicative testing. *Tox-Tips* is published monthly through the NTIS at an annual subscription rate of \$40 for mailings in North America and \$80 for foreign mailings. About 625 subscribers worldwide received *Tox-Tips* during FY 1982. Voluntary contributions of data to the publication were obtained chiefly from Federal agencies and industrial testing programs.

The *Proceedings of the Symposium on Information Transfer in Toxicology* was published in August. This symposium was sponsored by the DHHS/CCERP and the Interagency Toxic Substances Data Committee. It took place on September 16-17, 1981 in the Lister Hill Center Auditorium of the National Library of Medicine. Copies of the publication are now available from NTIS (order number PB82-220922) at a cost of \$12 per copy.

Database documentation and educational materials represented a major effort of the SIS publications project team. During FY 1982, various user-aids were prepared for the chemical and toxicological databases. These consisted of user manuals with detailed instructions for accessing and searching the files, and pocket cards and fact sheets concisely describing each database. In addition, an instructional package for use in teaching CHEMLINE, consisting of a workbook and slides, has been prepared, tested in NLM online services training classes, and is now available. Similar instructional packages for the other SIS databases will be prepared in FY 1983.

SIS staff instructed twelve initial NLM Online Services training classes (240 students) in the use of the chemical/toxicological files. Advanced training was provided on seven occasions in FY 1982 for 90 participants.

Online Services

CHEMLINE (Chemical Dictionary Online). NLM's online chemical dictionary file is intended to assist users with the nomenclature of the chemical substances that are reported in TOXLINE and some of the other NLM online services. CHEMLINE is updated bimonthly and regenerated annually. The file was regenerated in August 1982, and now contains 534,112 records for chemical substances. The EPA Toxic Substances Control Act Inventory (TSCAINV) of chemical substances is included. The growth of CHEMLINE is stabilizing in the range of 35,000-40,000 additional records per year. This, however, is dependent on the growth of the files it supports (TOXLINE, TDB, RTECS and MEDLINE). It is of interest that some 12,000 CHEMLINE records now direct users to MEDLINE via its directory function. Use fees charged by Chemical Abstracts Service (CAS), the provider of CHEMLINE content, have increased markedly in the past few years resulting in higher online rates to CHEMLINE users. Because of these increases the average number of online hours decreased to 286 hours per month in 1982 from 356 hours per month in 1981.

RTECS (Registry of Toxic Effects of Chemical Substances). The RTECS file, built and maintained from data provided by the National Institute for Occupational Safety and Health (NIOSH), continues to grow in both size and scope, increasing from 48,569 records in October 1981, to 55,174 records by September 1982. In addition to the 6,605 chemical substances added to the file, more than 6,000 records were updated during the year to reflect new toxicity data found in the literature, as well as new classes of data such as detailed mutation data and human reproduction data. NIOSH undertook a comprehensive quality control effort to review and update important data in RTECS such as the official Threshold Limit Values and the references to International Agency for Research on Cancer (IARC) Monographs. In addition, CAS Registry Numbers were verified with names of chemical substances, and corrections were made when required.

TDB (Toxicology Data Bank). The Toxicology Data Bank is an online fact retrieval service in toxicology, describing chemical substances that may be hazardous and may have significant human exposure potential. For each substance, TDB contains informa-

tion on pharmacology and toxicology, manufacturing and use, and environmental/occupational exposure. Data are extracted from monographs such as textbooks and handbooks, and are evaluated by the TDB Peer Review Committee (PRC), a group of toxicologists associated with the NIH Division of Research Grants Toxicology Study Section. In the course of this evaluation for correctness and comprehensiveness, information from the current literature may be added to the chemical record at the request of the PRC. Staff at the Oak Ridge National Laboratory carry out the required data extraction, editing, and computer input work for NLM.

By the end of FY 1982, the online file contained more than 3,000 completed records of which 700 were revisions. During the year, 448 new records were added to the TDB file, while 460 older records were updated and revised. All of these records were subjected to comprehensive review during four meetings of the PRC. TDB's usage continues to grow slowly, as documented by more than 1,800 hours (about 40,000 searches) of online use in FY 1982 compared to 1,740 hours in FY 1981.

Several initiatives were undertaken to enhance the utility and responsiveness of TDB. A user assessment of the file was conducted by the Life Sciences Research Office of the Federation of American Societies for Experimental Biology and a report is forthcoming. In addition, SIS initiated a collaborative project with the Computer Technology Branch of NLM's Lister Hill National Center for Biomedical Communication to establish a minicomputer-based system to build, maintain, and deliver TDB in a more cost-effective and user-friendly manner.

TOXLINE (Toxicology Information Online). TOXLINE, an online bibliographic retrieval service, is composed of an extensive collection of citations and abstracts derived in large part from the published journal literature dealing with human and animal toxicity studies, biological effects of drugs, pesticides, food additives, industrial and household chemicals, radioactive materials, and toxic pollutants. TOXLINE is updated monthly and, including its backfiles, now encompasses more than 1.3 million records. Because suppliers of TOXLINE subfiles increased their royalty charges, costs to users for each hour of prime time usage increased from \$35 (including royalties of \$13) as of October 1, 1981, to

\$52 (including royalties of \$30) as of October 1, 1982. Online usage of TOXLINE has decreased from 10,470 connect hours in FY 1981 to 8,905 during FY 1982. Online usage of TOXBACK74 was 1,001 hours in FY 1982; it was available only four months (June-September) in FY 1981 and used 290 connect hours.

TOXLINE was regenerated in April 1982. After removing duplicate citations, the publication years 1977 and 1978 were moved to TOXBACK74. Coverage of the three files now includes TOXBACK65 from pre-1965 through the 1973 publication years, TOXBACK74 from 1974-1978, and TOXLINE primarily from 1979 to the present. TOXLINE and TOXBACK74 are online files; TOXBACK65 must be accessed through OFFSEARCH.

A number of changes to the TOXLINE subfiles occurred during the year. Of the 11 sections in the CBAC subfile, which is obtained from Chemical Abstracts (CA), three (Sections 108, 159 and 160) will no longer be available beginning with the 11th Collective Index period. Arrangements were made to lease the CA Search file in order to recover content from these three sections. Abstracts are not available with CA Search; therefore, various subject headings indexed by CA were placed into TOXLINE's Abstract data element. This provides the user with entry terms for searching. Three new data elements, Classification Code (CA Section/Subsection), Corporate Name and Publication Type, were added to the file to accommodate the changes in the CBAC subfile. In addition, three other data elements previously available to TOXLINE are now being used in the CBAC subfile: International Standard Serial Number, Country, and Zip-code.

As of January 1982, the *International Pharmaceutical Abstracts* subfile, obtained from the American Society of Hospital Pharmacists, was divided into three "tracks." TOXLINE includes only the Research and Action tracks and not the Practice track. The last covers such areas as economics, legislation, and pharmacy practice.

The Environmental Protection Agency terminated funding for the publication *Pesticides Abstracts*. The PESTAB subfile in TOXLINE was a by-product of this publication. The last update to this subfile occurred in December 1981. Efforts are under way to find a replacement for the unique information in PESTAB.

AUDIOVISUAL PROGRAMS

William G. Cooper, Ph.D.

Acting Director, National Medical Audiovisual Center

During what was the last year of its existence as a separate organization, the National Medical Audiovisual Center (NMAC) carried on a vigorous program of in-house research and development while planning for future consolidation of its activities. The Materials Utilization Branch has been transferred to Library Operations; plans for the other branches are still being developed. Although NMAC activities are reported below under the separate branches, many of the programs have required an unprecedented degree of cooperation within and without the National Library of Medicine. The NMAC programs reported here are:

- Materials Utilization Branch
- Educational Research and Evaluation Branch
- Educational Training and Consultation Branch
- Learning Resources Laboratory
- Health Professions Resource Group
- Materials Development Branch

Materials Utilization Branch

On October 1, 1982, the functions performed by NMAC's Materials Utilization Branch were transferred to Library Operations where a new section, the Audiovisual Resources Section, was created. The transfer served to unite reference and distribution services for nonprint media at NLM with comparable services for more traditional materials.

The Audiovisual Resources Section will provide 1) integrated management of audiovisual and other nonprint information materials; 2) a focus for external relationships with health professionals and their organizations regarding the availability and use of audiovisual educational materials; 3) management of the historical film program; and 4) continuation of AV materials distribution services. The section will also develop and operate an expanded Learning Resource Center.

A major objective of NMAC has been to provide health sciences audiovisual materials and information to health professionals and students. Large collections of medical motion pictures and videocassettes

are available on loan. Selected AV packages produced by NMAC are placed with the sales program of the National Audiovisual Center, General Services Administration.

The 16mm Film Loan Program provides direct loan service of approximately 750 film titles to health science professionals. In FY 1981, more than 15,000 films were borrowed. In October 1981, a \$10 service charge was initiated for each loan to help defray operational costs. As anticipated, the fee had a negative impact on loan volume for FY 1982.

When the National Medical Audiovisual Center moved from Atlanta to Bethesda in 1980, planning was begun for a new Videocassette Interlibrary Loan Program, coordinated with the 11 Regional Medical Libraries to take advantage of the existing document delivery network. The program became operational in February 1981 at NLM with a collection of 1,000 of the videocassettes listed in AVLINE. By January 1982, all 11 regions were also making available subsets of 300 videocassettes to regional users through satellite collections. From January through September 1982, over 1,500 loans were provided in this manner. One important outcome has been to demonstrate that the sharing of videocassettes can be handled in much the same manner as books and journals, through existing loan networks.

In March 1982, after 9 years, the AVLINE Materials Review Contract with the Association of American Medical Colleges came to a close. In those 9 years, AVLINE has grown to include over 11,000 titles and has become a major bibliographic tool for identifying health science audiovisuals. Titles are no longer peer reviewed under the AAMC-developed system. NLM is exploring alternatives for evaluation including the increased involvement of professional societies. Producers themselves are also encouraged to be more responsible for quality assurance.

Reference service relating to the availability of audiovisual programs has been a major NMAC function. Over 5,000 such telephone and letter requests were answered this year.

NMAC has also developed the National Medical Historical Film Program. The goal of this program is to serve as a major national resource for information on motion picture materials pertinent to the history of the health sciences. Nearly 1,000 historical films have been inventoried and placed in proper storage conditions. Steady progress has been made this past year including the implementation of a detailed policy statement, a complete inventory of the existing core collection, physical setup, and the beginning of a cataloging system and information clearinghouse which will allow rapid retrieval and the preparation of lists and catalogs.

Education Research and Evaluation Branch (EREB)

EREB's in-house research program was concerned with planning and evaluation of several NLM internal studies. EREB planned, conducted, and has reported a diagnostic evaluation of NLM's Career Ladder Training Opportunity Program. The results of this seven month (part-time) project were forwarded to the NLM Director and to the EEO Committee in September. EREB also prepared the data collection plans required for a major NLM study of two prospective online public-access catalog systems (CITE-CATLINE and the ILS retrieval module). The staff scheduled, supervised, and took part in the study's spring and summer data collection effort, during which about 325 NLM patrons used, evaluated, and provided detailed data on each system's performance. Data analyses and assistance with final report preparation are scheduled for early in FY 1983.

EREB staff continued to direct the on-going evaluation and survey of the NMAC-MUB film and videocassette loan program clients. OMB authorization to extend this survey was secured early in FY 1982. Survey responses from clients now total about 1200 for film and about 600 for videocassettes. Preliminary data analyses for the latter program, which was instituted as an experimental service early in FY 1981, are scheduled for the first half of FY 1983.

A fourth internal study is associated with NMAC's microscopy-pathology video-disc project. EREB has planned and is overseeing the formative evaluations required for the project. This project and EREB's responsibilities to it extend through FY 1983. The EREB staff has a similar role and responsibilities in the recently begun project relating to the research use of human subjects. This collaborative effort with the Office for Protection from Research Risks, NIH, involves planning and implementation of evaluation studies, monitoring of evaluator-consultants, and project consultation. In addition, the staff prepared

an evaluation study of a videodisc training workshop for the NMAC staff, helped evaluate three RML optional task proposals, advised Library Associates on design and analysis of their research projects, and is participating in current planning for an NLM study of MEDLINE users and other online service patrons.

The EREB staff co-authored a major article on media use for the *Encyclopedia of Educational Research*, 5th Edition, a publication sponsored by the American Educational Research Association. They also edited and arranged for limited distribution of a videodisc state-of-the art paper prepared by a former staff member.

An EREB staff member completed an 800-item bibliography on cognitive and psychological aspects of aging, a project begun in an earlier graduate seminar. The past year saw the adoption of a set of NMAC-sponsored immunology teaching materials by almost $\frac{2}{3}$ of all U.S. medical schools. Originally developed under an EREB-monitored contract, the materials are now distributed free by a major pharmaceutical firm. The staff is continuing to compile a reading file of review articles that interpret the growing research literature on aptitude-treatment interactions; this literature represents the most important new direction in instructional and media research. Finally, the staff compiled a set of 1980 research library statistics to test certain growth predictions it had made and published prior to 1970. Among other things, the observed growth confirmed that such libraries generally double their holdings every 17 years, as predicted; extensions of this work are under development. Under EREB leadership, a research contract was awarded to the University of Iowa to fund a unique 18 month project to systematically study the process by which teaching faculty judge and select instructional materials for later adoption or use. It deals directly with audiovisual materials, with the role of AVLINE in the search-selection process, and with health professions faculty. For purposes of comparison, it also examines how these same faculty select other, more traditional instructional materials (such as textbooks) and how other faculty, not in the health professions, proceed in their selection of audiovisual materials.

Educational Training and Consultation Branch

The Educational Training and Consultation Branch (ETCB) continued to assist health professionals in planning, designing, using and evaluating audiovisual instructional materials. This assistance was provided through workshops, training resources, and direct consultation.

In FY 1982, the Educational Training and Consultation Branch conducted six workshops in Bethesda, Maryland, and eight at field training sites. Two hundred and forty-eight health professionals attended these workshops. A new workshop on "Using Videotechnology to Teach Communication Skills to Health Professionals" was field tested in Bethesda and will be made available to the field training sites in FY 1983. In addition, plans were initiated to provide workshops in two new areas: computer literacy and instructional simulations for microcomputers.

Two sets of training resources were field tested and made available for health professionals: a training kit for designing and conducting lecture skills training and a set of seven instructional manuals on teaching communication skills to health professionals. The training kit includes a review of contemporary approaches to teaching lecture skills, a description of the salient lecture skills, methods for teaching and an annotated bibliography of audiovisual teaching resources. The seven instructional manuals provide information on planning, implementing, and evaluating instruction, in addition to techniques for teaching specific communication skills. Both sets of materials are available for purchase through the National Technical Information Service.

The Educational Training and Consultation Branch provided over three hundred in-house consultations to health professional teachers and administrators. In addition to these consultations, the Branch participated in collaborative activities with other National Library of Medicine programs. Two major collaborative activities dealt with MEDLARS training and a study of online catalog users. In the MEDLARS training activity, ETCB staff participated in the development of objectives and training guidelines for initial online training. The online catalog study involved staff participation in the development and tryout of written user instruction and online user instruction. Both of these activities provided training staff with the opportunity to apply instructional design and training skills to the special problems and considerations involved with online computer use.

Learning Resources Laboratory

Current applications research in the Learning Resources Laboratory is a logical next step in the decade-long history of computer based education (CBE) activities in the Lister Hill Center. The emergence of two new technologies during the late 70's and early 80's afforded the opportunity for exciting new approaches in this arena. The reference is to powerful, low-cost microcomputers and to the

laser discs (optical videodisc). The microprocessors make possible the development of local CBE with stand-alone systems. The videodisc player under program control by a microprocessor adds a new dimension to health professions CBE by the incorporation of a large, high-quality, full-color, visual database. This represents an advance in that, previously, hardware required separate display devices for computer and pictorial outputs and pictorial material was generally not under program control. In addition to using a single display device, this hardware configuration permits a full range of graphic capabilities.

During 1981-82, standard, off-the-shelf microcomputers were acquired for the Learning Resources Laboratory and two pilot videodiscs were mastered in order to demonstrate prototype CBE modules utilizing these new technologies. Collaboration was obtained in the areas of content and computer science from government and nongovernment experts.

The first pilot videodisc utilized existing videotape material from the University of Arkansas. This videodisc can serve both as a stand-alone presentation of a specific content area ("Cellular Alterations and Adaptations") as well as a visual database for CBE modules. The second pilot videodisc contains, primarily, the visual database for a dental case stimulation. The program was developed under an NLM contract with the University of Nebraska. The computer program was written in TUTOR (the PLATO authoring language) and has been translated into the PILOT language to run on the Advanced Terminal System (ATS). It is planned to make a further translation of the ATS version so that it will run on commercially available microcomputers. Other program materials included on the second videodisc are some tropical medicine visuals and several radiographs. Demonstration courseware (software) was developed for both pilot videodiscs which were mastered in FY 1981. Two modules each in basic medical pathology (videomicroscopy) and videoradiology were developed and tested.

In collaboration with others outside government, two new programs in videomicroscopy were recorded for eventual transfer to videodisc. They are "Cellular Alterations and Adaptations" (re-recorded in higher quality) and "Cell Injury and Cell Death." In collaboration with the Bureau of Radiological Health (FDA), the Uniformed Services University of the Health Sciences, and the American College of Radiology; a premastering of a second videodisc has been completed. This disc represents a sampling of the American College of Radiology Learning File of Radiographs.

The LRL was visited in FY 1982 by some 250

health professions educators and others who were interested in being briefed on, or in getting "hands on" experience with, the latest hardware/software available.

Advanced Terminal System. The Advanced Terminal System (ATS) was developed by the LHCNBC's Computer Technology Branch. It has been described in the LHCNBC chapter of previous years' reports. Field testing by the National Medical Audiovisual Center was completed in September 1982 and evaluation reports are now being prepared. This evaluation of the ATS field tests will result in a better understanding of the requirement and need of the health sciences community in the area of computer based educational technology. This information, along with an analysis of the activities taking place in the private sector, will help to define the future scope and role of the National Library of Medicine's efforts in CBE for the health sciences.

Health Professions Resource Group. The Health Professions Resource Group was organized to provide technical assistance to health care and educational institutions in identifying health science and learning materials. The group is NMAC's primary contact with the health professions community for collaboration in solving educational and communication problems and issues. Issues addressed concerned the use of media to enhance curricula and communications—problems not likely to be addressed by the private sector.

Among the projects carried out by the group in FY 1982 were the following:

- Planning and initiating a program, under an inter-agency agreement, for the Education Program for Health Professionals in the Protection of Human Subjects in Research Risks.
- Experimenting with cataloging and preserving in permanent form a rare collection of human brain section slides.
- Developing education programs in dental diagnostic simulation.
- Developing short-term learning programs for specialized groups of health professionals.

Assistance has been requested from Boston University Center for Educational Development in Health's Collaborative Project for Curriculum Development in Preventive Medicine in developing an indexing-cataloging and retrieval system for the instruction materials currently being field tested. HPRC, in cooperation with other branches in NLM, is

in the process of addressing the details of the request, i.e., exploration of appropriate indexing, cataloging and retrieval system features required, as requested. The results of this exploratory activity are expected during mid-FY 1983.

Materials Development Branch

In FY 1982, a large part of the electronic equipment and systems planned for NMAC's Bethesda operation became operational, including one-inch, two-inch, and ¾ inch (videocassette) videotape recording and editing systems to support the Branch's materials development projects. These projects encompass applied research, production of prototype health sciences education units, and collaborative audiovisual projects.

During FY 1982, MDB became active in the pre-mastering of materials for the production of optical videodiscs. A prototype disc was produced on "Dental Simulation," which included also selected radiographs and visual materials from the field of human genetics. In conjunction with the University of Arkansas and professional associations in the field of pathology, videodisc materials were also developed for evaluation as possible self-standing or microprocessor-controlled teaching units utilizing videomicroscopy. Other videodisc experiments were begun in FY 1982 in collaboration with the History of Medicine Division and the LHCNBC's Human Genetics Knowledge Base Program.

In cooperation with NLM's Office of Inquiries and Publications Management, MDB revised and expanded a film/videotape documenting the establishment of the Lister Hill Center Building, to provide a brief overview of all major NLM program activities. A slide-tape/videotape on NLM's organization and services, entitled "The NLM Story," was also expanded and updated for use in the orientation of new NLM employees. The last in a videotape series of "Distinguished Leaders in Nursing," featuring Martha Rogers, was completed and turned over to the Materials Utilization Branch for entry into NLM's distribution systems.

The Branch's Office of Training Facilities Coordination now has responsibility for scheduling, coordinating and providing of audiovisual support to meetings held in the Lister Hill Center Auditorium and in the NLM conference/training rooms. Auditorium use, primarily by non-NLM users, increased 75 percent over FY 1981. Auditorium meetings, seminars, and training programs totaled 433 hours during 77 days of actual use.

Audiovisual Programs

Table 12.
Selected Program Statistics, NMAC

<i>Activity</i>	<i>Number</i>
Films shipped	8,000
Videocassettes shipped	1,500
Teaching packages sold through GSA	900
Reference requests answered	5,000
NMAC-based consultations	300
Monographs issued	2
NMAC-based workshops	6
Regional workshops	8
Auditorium presentations	54
Audiotapes	40
Photo prints/slides	11,975
Slide/tape units	1
TV productions	4

LISTER HILL NATIONAL CENTER FOR BIOMEDICAL COMMUNICATIONS

William G. Cooper, Ph.D.
Acting Director

The Center conducted the following research and development activities during FY 1982:

- Knowledge Base Research Program
- Electronic Document Storage and Retrieval Program
- Video Processing Laboratory
- Integrated Library System
- Distributed Information System
- Computer Based Education Program Development

Knowledge Base Research Program (KBRP)

The KBRP is a fundamental research program that requires long term support. Its purpose is to find new ways to structure medical knowledge, to organize it, and to represent it in the computer in ways that can be responsive to the information needs of health care professionals. The three components of the KBRP are medical content research (textual and visual information), medical computer science research, and biomedical information processes.

A derivative product of the KBRP from the Human Genetics Knowledge Base (HGKB) project was the preparation of machine-readable tapes, an expanded index, an author index, and introductory material for publication of the 6th edition of *Mendelian Inheritance in Man*, November 1982. This book will provide the latest synthesis of textual and reference information for approximately 3,400 genetic phenotypes, which have been reviewed by a panel of experts. It will also be a focal point for expanding textual entries; restructuring information; and identifying, selecting, and indexing visuals coordinated with textual information.

The activities of the Program are being directed toward the computer representation of medical information, building on our experience with the experimental Hepatitis Knowledge Base and other text data bases in human genetic and peptic ulcer disease. We believe it is best to focus on the representation of

medical knowledge rather than more production oriented activities. Therefore, most of the efforts have supported the compilation of domain-specific vocabularies, concept identification and organization, information structure and vocabulary relationships, and methods for logically and physically representing the information in the computer. The goal of this activity is to merge modern technology with biomedical textual and visual information to provide rapid transfer of appropriate knowledge to health professionals to assist the medical decision-making process.

Electronic Document Storage and Retrieval (EDSR) Program

The goal of this effort is to research and develop document storage and retrieval techniques that will address a major mission of the NLM, viz., that of providing an archival storage capability for biomedical literature. The immediate objective is to develop an engineering prototype system capable of demonstrating the feasibility of key features, such as scanning, storage, retrieval and reproduction of black and white (two-tone) representations of materials from books and journals. The program will also explore areas such as the following:

1. The ability to input biomedical information recorded in different forms and media, including bound volumes, loose-leaf pages, film, and in machine-readable form.
2. The reproduction of half-tone images such as photoprint.
3. The increase in storage capability by the incorporation of appropriate data compression techniques.
4. More rapid document handling capability.

The present status of ongoing activities may be briefly summarized as follows: The loose-leaf scanning capability of the document capture subsystem has been integrated as a unit, and is operating. In addition, a bound volume scanner is being designed and

will be completed in FY 1983. Interfaces have been developed and demonstrated for the display subsystems, including hardcopy, softcopy, and a dual-mode hardcopy/softcopy device. The system controller that exercises supervision and control over the subsystems is being developed and integrated with the other subsystems. Following the system integration phase, the prototype system will be evaluated for technical performance and be used to explore advanced techniques in document storage and retrieval.

Video Processing Laboratory

The Video Processing Laboratory (VPL) has established an inhouse capability to aid the development, evaluation, and simulation of various video and image processing technologies. An example is the development and evaluation of a videodisc pre-mastering capability to enable the transfer and assembly of still images and motion video segments, coupled with audio and computer data, onto high quality videotape. This videotape is the medium subsequently required to create a master for the mass replication of videodiscs. The pre-mastering capability was developed and evaluated in the VPL and has become operational. At present, the VPL is being used to develop an image processing capability to support health care information systems through the application of state-of-the-art systems handling video, audio, and electronically manipulated graphic and textual materials.

Integrated Library System

The Integrated Library System (ILS) R&D program is creating a computer-based system to handle the main functions of libraries, such as acquisition of documents and control of their circulation. Much of the research and design effort has been put into making it easy to use without prior training in the computer field. The ILS is approaching the completion of its R&D phases. Because the system will have great potential to many libraries and because it will have to be maintained in order for that potential value to be realized, it is appropriate to plan for an orderly process of technology transfer. We plan to initiate two separate evaluations of ILS, one to evaluate the program and the other to evaluate the impact of such automated facilities as ILS on the users of biomedical libraries. The ILS program development will be terminated in December 1983.

The Integrated Library System is now operational at the following libraries: Army Library, Pentagon; University of Maryland Health Sciences Library, Baltimore; Johns Hopkins University; Welsh Medical Library; National Library of Medicine Staff Library;

Naval Research Laboratory Library; and Carnegie-Mellon University Libraries. Evaluations of ILS are underway at United Technologies Research Center Library, Hartford, CT, and the British Library, London, England.

ILS Version 2.1 License and Interagency Agreement with the National Technical Information Service have been approved. Libraries may obtain the ILS software from NTIS or the Federal Software Exchange.

Distributed Information System

The Computer Technology Branch plans to extend the development of both an interactive text management capability and a Distributed Information Delivery System (DIDS) as integral components of an overall Distributed Information Systems (DIS) program. The objective of the DIS program is to determine whether the extension of the DIDS model (previously used for the delivery of Hepatitis Knowledge Base information together with an Interactive Text Management System) could be adapted for the Toxicology Data Bank (TDB). The Division of Specialized Information Services views this collaborative project as an alternative way of creating and maintaining a "knowledge" base like TDB in a more cost-effective manner as well as providing a more convenient interface for user access via an interactive delivery system.

The goals of the Distributed Information System Program are: 1) to extend previous LHC/CTB efforts in the application of computer systems to the delivery of biomedical information; 2) to extend previous efforts in interactive text management in order to provide an alternative form of delivery for data bases containing structured as well as free text fields; 3) to provide integrated online support for a peer review process; and 4) to demonstrate transferability to systems at different levels of technology.

Computer Based Education

The Computer Based Education (CBE) program has been active since the early 1970's and has played a leading role in advancing the state-of-the-art for the community. Past accomplishments include:

1972 — implementation of the CBE language PILOT on an 8-bit microprocessor (released to the public domain)

1973-1975 — establishment of a nationwide network for CBE utilizing existing institutional courseware and available communications network (now privately operated as the Health Education Network)

- 1976 —hosting a nationwide computer conference on CBE, with emphasis on PILOT, to gather and exchange information, ascertain needs, etc.
- 1976 —establishment of Learning Resource Laboratory to be able to review a cross section of current technology in a single setting (this laboratory is now maintained in NMAC)
- 1978 —implementation of COMMON PILOT in UCSD PASCAL (in the public sector it is also called APPLE PILOT with well over 1,000 licensees)
- 1976-1982—development of LHC ATS PILOT and LHC 8080 PILOT (released to the public via NTIS)
- 1976-1982—development of the Advanced Terminal System (ATS) (field test efforts finishing September 1982)

Board of Scientific Counselors

The Board of Scientific Counselors of the National Library of Medicine met for the second time, on October 5-6, 1981, to review the programs of the Lister Hill National Center for Biomedical Communications. The Board found all of the LHNCBC programs to be scientifically and technically sound, but recommended certain changes of emphasis. The Knowledge Base Research Program, for instance, should work on developing means of knowledge representation (with the computer science team) rather than building new databases. The Distributed Information System Program should work more closely with Specialized In-

formation Services for possible application of DIS to the Toxicology Data Bank. The Electronic Document Storage and Retrieval Program is in the process of completing its hardware efforts, but will require additional resources in the areas of maintenance, software, and hardware. Further development of the Advanced Terminal System should await results of the field trials and evaluations. The Integrated Library System should continue technical development while monitoring commercial development. Decreased emphasis of the Digital Videodisc Project was recommended, although the Board felt that inhouse competence in the field should be maintained.

The third meeting of the Board of Scientific Counselors took place on April 22-23, 1982. The Board reviewed LHNCBC staff presentations on: the Knowledge Base Research Program, Advanced Terminal System, Electronic Document Storage and Retrieval Program, Integrated Library System, and the Distributed Information System. Board members prepared special reviews of two programs, the Integrated Library System and the Distributed Information System. They predicted that if the ILS is imaginatively and forcefully transferred to the library community, it will be widely viewed as an outstanding contribution of advanced research, technology development and application development. The Board welcomed the Distributed Information System as an opportunity for LHNCBC to engage in a useful collaboration with NLM's Division of Specialized Information Services. The successful outcome of this initiative may serve as a model for similar collaborative efforts with other Federal agencies concerned with sharing information and health-related data bases.

EXTRAMURAL GRANTS AND CONTRACTS

Arthur J. Broering

Acting Associate Director for Extramural Programs

The National Library of Medicine's Extramural Programs, authorized by the Medical Library Assistance Act (MLAA) of 1965 and extensions, support improvements in health information services and biomedical communications by providing grants to develop and extend library services, strengthen information resources, conduct research in ways of improving communication and knowledge transfer, train health information personnel, and produce critical reviews and other publications on important health topics. In addition, contracts provide for a national network of Regional Medical Libraries with the necessary resources and services to give backup support for local medical libraries. During FY 1982, awards were made for 40 new grants, and 61 continuation grants for activities begun in prior years.

The total MLAA expenditure for FY 1982 was \$7,500,000 (see Table 13), which was a 25% reduction from the FY 1981 level and a 16% reduction from the initial FY 1982 budget request. The immediate impact of the \$7.5 million level, the result of a one-year MLAA extension in the Omnibus Reconciliation Act of August 1981, has been a reduction of support levels (about 6%) for current projects. However, such reductions should not be presumed to be related to congressional disenchantment with the MLAA authorities. The House report on the extension of the MLAA programs acknowledges that "the support provided by (the programs of) this Act represents an important investment in promoting rapid transfer of medical information essential to reduce the critical time lag between discovery and practice."

The Congress is presently considering legislation to renew MLAA authority for all programs for three years (FY 1983-85) at amounts of 8, 8.5, and 9 million dollars.

Research Program

The goal of this program is to improve the management of health knowledge by sponsoring investigations of issues relative to biomedical information. A formal assessment of the program in FY 1982 con-

cluded that investigators supported by NLM research grants are productive and are in fact making the contributions foretold in their proposals. The program has two complementary areas: Computers-in-Medicine, and Health Sciences Librarianship-Information Science. In both areas, special emphasis is given to the career growth of young investigators.

The aim of the Computers-in-Medicine program is to exploit and adapt the potential of the computer sciences for better representing, managing, and utilizing recorded health knowledge. Investigations in this area, both theoretical and applied, include systems for knowledge representation, attributes of language in medical context, and the cognitive processes involved in medical decision-making and problem solving.

The aim in the Health Sciences Librarianship-Information Science area is to develop new approaches to information access and to resolve serious problems of information delivery such as the organization, access, and dissemination of literature; bibliographic analysis to describe current scientific activity; and applications of the computer and information sciences for a variety of roles in library operations and health information delivery.

Training Programs

In 1973 a training grants program in Health Sciences and Computer Technology was initiated by NLM. More than \$12 million has been awarded for the program (including commitments made for 1983 and 1984). Initially, the program was relatively small; however, it grew rapidly and by 1981 had exceeded \$1.3 million annually, almost 20% of the total grant budget.

The background, current status, and future directions for the training program were thoroughly reviewed during the year. It was decided that the program should be continued because it represents a very important endeavor, and remains neglected by other Federal funding agencies. The momentum built up since 1973 would be irretrievably lost if the pro-

gram were discontinued. However, because funds will be severely limited and because it is unlikely that the program can be expanded in the near future, applications in this area will undergo especially vigorous review in FY 1984.

Awards were made to nine institutions in 1982. These are: University of California, San Francisco; University of Missouri-Columbia; University of Illinois, Urbana; University of Minnesota; Case Western Reserve University; The Ohio State University; Duke University; University of Virginia; and New England Medical Center. Stipend funds to support 50 trainees are included.

Medical Library Resource Grants

This grant program is intended to improve health science libraries by expanding their resources. Specifically, there are two types of Resource Grants—the Resource Improvement Grant and the Resource Project Grant. The Improvement Grant is intended to develop basic collections, and is available to single health science institutions and to consortia of various types of organizations involved in health science education, research, and patient care. In FY 1982 there were nine new awards both to consortia and to single institutions.

The Resource Project Grant enables health science libraries to undertake new or expand existing services. In FY 1982 five new project awards were made:

- A two-year grant to Ellis Hospital in Schenectady, New York, will enable the 29 members of the SAVE (Shared Audiovisual Equipment) Consortium to share audiovisual software and hardware. The members consist of hospitals, nursing homes, and other health institutions.
- Altoona Hospital in Pennsylvania was awarded a grant to develop a microprocessor-based system for its total library operations.
- The Huntington (W. Va.) Health Science Library Consortium received a grant to purchase binding equipment which can be shared among its twelve members. Marshall University is administering the grant for the consortium.
- A one-year grant was awarded to the Health Sciences Library at the University of Utah to update its computer hardware and software in order to produce the *MEDOC Index*. This is an index to U.S. government publications in the health sciences and it is distributed to more than 350 subscribers.
- The University of Wyoming in Laramie received a three-year grant to develop a statewide health sciences information network.

Publication Grants

The Publication Grant Program funds a variety of nonprofit, biomedical scientific publications. Administered in the International Programs Branch, these programs utilize both domestic and international resources. The international biomedical publication program, authorized under Public Law 480 and funded with special foreign currencies, is described in the next chapter.

Publication grants under the Medical Library Assistance Act provide selective support to U.S. health professionals for the preparation and/or publication of critical reviews and monographs in health fields: secondary literature tools (such as bibliographies, atlases, and catalogs); publications in library science, biomedical communication, and information and computer sciences; temporary support for periodical publications; studies in the history of medicine; translations of current foreign biomedical monographs; and proceedings of symposia related to U.S. health needs.

During FY 1982, 20 publication grants were awarded, totaling \$503,452. Of these, seven were new awards, including a study of the life and contributions of the American public health statesman, C.E.A. Winslow (1877-1957), who became one of the most potent forces in public health advancement in the United States. The continuing emphasis in this program upon high-quality, but low-cost, projects that are scheduled for early publication was reflected in the average amount of a publication grant in FY 1982, which was \$25,172, including both direct and indirect costs.

Among the studies published in FY 1982 which had received earlier support in the Publication Grant Program was *The Social Context of Medical Research*, edited by Henry Wechsler, et al. (Cambridge, Massachusetts: Ballinger Publishing Co., 1981), which explores issues and problems related to the conduct of medical research and the application of research findings. A significant, multi-authored volume published this year aims at bridging the gap between basic microbiology and clinical disease—Alfred S. Evans, ed., *Viral Infections of Humans: Epidemiology and Control*, Second Edition, (New York: Plenum Medical Book Co., 1982). Also completed this year with support from this NLM program was a major history of Western medical thought, written by Dr. Lester King, a distinguished U.S. medical historian: *Medical Thinking: A Historical Preface* (Princeton, N.J.: Princeton University Press, 1982).

(See Appendix 2 for a complete listing of books, periodicals, and journal articles received in FY 1982 resulting from NLM Publication Grants.)

Extramural Programs

Table 13.
Extramural Grant and Contract Programs
(in thousands of dollars)

<i>Category</i>	<i>FY 1980</i>		<i>FY 1981</i>		<i>FY 1982</i>	
Research	(32)	\$2,794	(31)	\$2,774	(31)	\$2,574
Resource Projects	(26)	1,003	(21)	895	(14)	520
Resource Improvement	(47)	593	(35)	747	(25)	551
Training*	(10)	1,638	(10)	1,308	(9)	930
Special Scientific Projects	(6)	143	(7)	289	(2)	22
Regional Medical Libraries*	(8)	2,967	(9)	2,999	(9)	2,399
Publications*	(35)	787	(34)	818	(20)	504
Total	(164)	\$9,925	(147)	\$9,830	(110)	\$7,500

NOTE: Figures in parentheses refer to number of projects.

*Includes contract funding.

INTERNATIONAL ACTIVITIES

Mary E. Corning, D. Sc.
Assistant Director for International Programs

The international programs of the National Library of Medicine are a natural extension of NLM's domestic responsibilities. These activities are cooperative in nature and have relevancy to both the developed and the developing world. During the past year there has been a continuation of the International MEDLARS Agreements and a meeting was held of the policy officials of those countries where NLM has bilateral arrangements. Cooperation with the World Health Organization has been expanded to include the preparation of two specialized recurring bibliographies. The Special Foreign Currency Program is active in the production of critical reviews and history of medicine projects. Other NLM international activities have included specialized training for colleagues from abroad, the NLM publications exchange program, as well as numerous professional visitors from abroad.

International MEDLARS Agreements

Table 14 lists the existing non-U.S. MEDLARS Center countries and their nature of access to the MEDLARS system. In September 1982, the Karolinska Institutet of Sweden hosted a meeting of the policy officials from each of these Centers. The meeting included a description from each of the foreign centers about its recent developments, plans for the future, quid-pro-quo arrangements, the role of government in providing biomedical information, the impact of tech-

nology, and the relationship between developed and developing countries.

In their discussions of the role of the government, the members of the group prepared a statement which they asked be forwarded to the Director of the National Institutes of Health and the Secretary of Health and Human Services. This statement reflects the professional recognition that biomedical and health information is a basic necessity to maintain and advance biomedical and health research, education, and care. The statement follows.

The INTERNATIONAL MEDLARS POLICY ADVISORY GROUP represents health related scientific and educational institutions and libraries in 12 countries. We wish to emphasize that there is an existing and growing need to supply high quality information as efficiently and economically as is possible.

We view the MEDLARS system as the most valuable national and international resource which assists and enhances medical research, education and health care delivery throughout the world. The imaginative and innovative programs developed in NLM as the MEDLARS group of information services have become an integral part of the research cycle which creates new knowledge not only in the United States but in our own countries and therefore internationally. Any action which hinders the operation of this cycle by placing undue

Table 14.
Non-U.S. MEDLARS Centers

<i>Tapes</i>	<i>Tapes/Software</i>	<i>Online NLM</i>
Germany	Australia	Canada
Japan	PAHO	Colombia
Switzerland	Sweden	France
		Italy
		Mexico
		South Africa
		United Kingdom

financial barriers in the way of those who make use of the information reduces the value of the investment which the taxpayer has already made in this important field.

Our relationships through bilateral arrangements, based on sharing knowledge, expertise and facilities with NLM have been in existence for 15 years. The result is an international medical and health care information network operating successfully and notably responsive to the needs of public health and society generally. The effective dissemination of medical information to all countries including those of the developing world has been greatly advanced.

We believe that our responsibilities and functions are fundamental to the public good and that this service could not adequately be undertaken by commercial profit making interests in whom we do not have the same level of confidence.

We therefore view with great concern the pressure being exerted on the U.S. National Library of Medicine by certain commercial information interests. The responsibility for the continued functioning and development of this system, fundamental to the health information needs of many countries, cannot be transferred to commercial enterprises but must remain firmly anchored in public sector authorities.

The allegations that NLM represents unfair competition are not valid. Each non U.S. MEDLARS Centre provides an equitable return to NLM in the form of services directly or indirectly by payments to U.S. information industry to perform these services for NLM. This contribution is equivalent to the costs for access to the MEDLARS system.

We ask that this expression of our concern and our support for NLM be made known to its parent organizations: The National Institutes of Health and Department of Health and Human Services.

Collaboration with the World Health Organization

The National Library of Medicine and the World Health Organization Special Program for Research and Training in Tropical Diseases continued to cooperate in the publication of the *Quarterly Bibliography of Major Tropical Diseases*. NLM prepares camera-ready copy which WHO prints and distributes to approximately 5,500 institutions in the developing countries. The bibliography is prepared from the MEDLINE system and covers those diseases WHO had identified for special attention—filariasis, leishmaniasis, leprosy, malaria, schistosomiasis, and trypanosomiasis.

Furthermore, the WHO Program for Control of Diarrheal Diseases requested NLM's assistance in a

recurring *Bibliography of Acute Diarrheal Diseases*. This bibliography has been issued for the first time within this fiscal year using the same mechanism of NLM producing camera-ready copy from MEDLINE and WHO printing and distributing.

NLM and WHO continued the collaborative arrangement for provision of photocopy of journal articles to developing countries of the WHO Regions of Africa, Eastern Mediterranean, and South East Asia. Under the arrangement, WHO supports one individual who is in residence at NLM to provide this service. The level of activity is modest and it responds only partially to the existing biomedical and health information needs of developing countries.

WHO has been active in working with developing countries to identify existing resources for biomedical and health information and to develop mechanisms for providing information services. The Director of the National Library of Medicine is a member of the WHO Advisory Committee on Medical Research Subcommittee on Biomedical Information which is chaired by Professor Sune Bergstrom, Rector Emeritus of the Karolinska Institutet and Chairman of the WHO Global Advisory Committee on Medical Research. The Assistant Director for International Programs of NLM is the Director's alternate. They attended a meeting of this Subcommittee following the International MEDLARS Policy Advisory Group. Included in the summary and recommendations of the final report of the ACRM Subcommittee on Information were the following:

"Regional and national medical libraries and information networks to share scarce resources are now being planned or are under implementation or development in all Regions in close contact with Headquarters. Those efforts are to be expanded and sustained as they are a prerequisite for the successful implementation of WHO health plans. The model of resource sharing and network implementation that is being developed by BIREME should be examined for its potential application in other areas of the world.

"The Subcommittee is pleased that several regions have or are preparing regional Index Medicus, that PAHO and Headquarters have developed document information services using the 'Medical Subject Headings' (MeSH) vocabulary, and that SEARO and Headquarters are planning a pilot project for the bibliographic control of fugitive health literature on health services research.

"The Subcommittee recognizes that there exist national literature, documents, audiovisual

materials, etc., which are not now accessible in an organized manner. There is a need for studies to assess the size, scope and quality of such fugitive material. Efforts to collect, organize and index such material into bibliographic systems should use the same internationally-accepted cataloguing rules and standards and MeSH. In this manner, the resulting bibliographic systems and products in the whole health field will be compatible with each other and with the regional and global Index Medicus/MEDLARS.

"The Subcommittee considers the selective dissemination of bibliographic information with abstracts as exemplified by the *Quarterly Bibliography of Major Tropical Diseases* as an important and cost-effective method to keep health researchers in developing countries informed about progress in their field of interest. Access to full articles should be improved by resource sharing networks, regional interlibrary loans (photocopies) services and library manpower training."

Collaboration with the Pan American Health Organization

The Library's Assistant Director for International Programs is a member of the Scientific Advisory Committee for the PAHO Regional Library of Medicine—BIREME—and participated in a meeting of this committee. The Director of BIREME, Dr. Abraam Sonis, has retired and the current Director is Dr. Fernando Rodriguez Alonso. BIREME is unique in the world as a regional resource. It provides library services, computer-based bibliographic services from the subset of the MEDLINE database, trains Latin American librarians and has produced a *Latin American Index Medicus*.

Special Foreign Currency Program

The Library's Special Foreign Currency Program, authorized by Public Law 83-480, as amended, utilizes appropriations of U.S.-owned, local foreign currencies to make awards for scientific writing and publication projects in cooperating countries, including Egypt, India, Israel, Pakistan, Poland, and Yugoslavia. The programs in Israel and Poland were continued under collaborative bilateral research agreements.

Projects in the six cooperating countries include the preparation of critical reviews and monographs analyzing biomedical research and practice; translations of foreign monographs in the health sciences; studies in the history of medicine; the publication of major international symposia and conference proceedings; and the preparation and publication of

bibliographies, guides and other literature tools in the biomedical sciences. The program enables the Library to draw on foreign scientific personnel and resources in obtaining and disseminating information important to U.S. health educators, practitioners, and researchers.

The projects are multiyear, and during FY 1982, there were 89 active studies, totaling \$1,013,844 (equivalent) in foreign currencies. Over 50 percent of the current program is carried out in Poland and Egypt, with about 20 percent in India. New critical reviews and monographs in health fields constitute 45 percent of the projects, with history of medicine projects representing another 30 percent.

Among the new P.L. 480 projects activated in FY 1982 were a critical review on the endocrine system in patients with acute renal failure, the publication in Egypt of the seventh volume of a major international bibliography of ticks and tickborne diseases, and a translation of a Russian study of the geographical pathology of atherosclerosis. Among the publications received in FY 1982, resulting from prior support, was a monograph by J.W. Czaczkas and A. Kaplan De-Nour on *Chronic Hemodialysis as a Way of Life* (New York: Brunner Mazel Publishers, 1978). Written by two internationally renowned experts, and addressed to medical and psychiatric practitioners, the book covers every aspect of hemodialysis. Another study recently published with support from the P.L. 480 program was an English language translation of the last work of the late Alexander R. Luria, a universally recognized Soviet neuropsychologist—translated in India and printed in the United States: *Language and Cognition* (Washington, D.C.: V. H. Winston and Sons, 1981). Among the recently published studies in the history of medicine was: *Two Great Scientists of the Nineteenth Century; Correspondence of Emil Du Bois-Reymond and Carl Ludwig* (Baltimore: The Johns Hopkins University Press, 1982). This book presents a fifty-year correspondence between two of the most important figures in the development of modern physiology, and offers an insight into nineteenth-century medicine. The text was translated in Tunisia and printed in India. (For a complete list of books and journal articles resulting from the NLM P.L. 480 Program received in FY 1982, see Appendix 3.)

International Council of Scientific Unions Abstracting Board (ICSU AB)

The Assistant Director for International Programs and the Deputy Director, as the NLM representative and alternate, respectively, to the International Council of Scientific Unions Abstracting Board (ICSU AB), attended the annual meeting of the Board. ICSU AB

consists of information organizations from a number of countries. Topics discussed included collaborative undertakings, status of document delivery in various regions including the proposals of the Commission of the European Communities, working groups in various subject matter fields, copyright, and an examination of the future role of ICSU AB in international, scientific and technical activities.

Visitors and Specialized Training

NLM continues to receive international visitors who during FY 1982 represented approximately 84 countries as well as specialized delegations. Formal delegations were concerned with international communications, library management and resources, information systems management, and the impact of technology.

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APPENDIX 4: NMAC AUDIOVISUAL MATERIALS PRODUCED

Videotapes

NLM: Communicating for the '80s
Videomicroscopy Units I, II
Distinguished Leaders in Nursing: Martha Rodgers

Slide/Tape Sets

The NLM Story

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