

New NLM Building on the Drawing Board

High-Tech Facility Will Take Library Into 21st Century and Beyond



NLM's past, present and future come together as former NLM Director (1964-83) Martin M. Cummings, MD reviews the sketch of the proposed new NLM campus during a recent visit to the Lister Hill Center.

The fact that libraries get larger as they get older is not exactly a news flash. But, sometimes, the need for libraries to expand is especially urgent.

In the early days of the 21st century, the National Library of Medicine has read the tea leaves and embarked on exhaustive planning for a third building on the campus of the National Institutes of Health. There are also plans to extend two levels of the existing stacks to accommodate an additional 30 years of growth of the collection.

Perry Dean Rogers Partners Architects of Boston, Massachusetts, have been engaged to prepare the plans, working with CETROM Architects and Engineers, Gaithersburg, Maryland. The proposed new building, and an expansion of the existing main Library facility, will create some 350,000 gross square feet for the collection, office space and laboratories. (The two current NLM buildings have a combined 447,000

square feet.) Architectural and engineering design funds have been provided. The new building will be located behind the current library and situated northwest of the existing Lister Hill Center.

Why the big push to expand right now?

Actually, momentum for the expansion project began when the NLM Board of Regents passed a resolution at its January 1999 meeting that included the following language:

To forestall the imminent crisis in the Library's ability to process genomic data vital to medical research, and to provide space to house the rapidly expanding collections of the world's preeminent medical library, the Board of Regents urges the Secretary of Health and Human Services to support the acquisition of new space for the National Library of Medicine to meet its commitment to the nation.

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Certainly NLM, with subscriptions to over 23,000 of the world's biomedical journals and its burgeoning collections of books, audiovisuals and other materials, could use much more elbow room in its stacks, which first went into use 40 years ago. Interestingly, current world production in hard copy of scientific journals, articles, research reports, monographs and modern manuscripts is exceeding all estimates.

Some have forecast for years that, in an electronic world, books and other printed materials would vanish and physical libraries would go the way of the dinosaur. As the medical library of record for the nation and the world, NLM has seen no evidence to support that theory. Rather than saving space, electronic publishing actually requires additional space for archiving and keeping accessible the many generations of electronic materials. NLM experts estimate that, unless more space is found somewhere, new materials for the collection will have to be turned aside by 2004.

Clearly, however, it is the Library's expanding programmatic mission that generates more pressure for a larger space. NLM needs a physical facility commensurate with its expanding role in several areas: the scope of information handled, from books or articles, through multimedia, to source databases such as GenBank; and the number and diversity of customers served, from its traditional clients, scientists and health professionals, to consumers around the globe.

NLM's current facilities were designed to handle 650 people but now hold over 1,000, including contractors. If increases continue at the current rate, NLM will have to accommodate 1,500 by the year 2005.

NLM's fastest growing program is the National Center for Biotechnology Information (NCBI), created by Congress in 1988. Dramatic advances in molecular biology and bioinformatics hold great potential for improved understanding of basic biological processes and, in turn, advances in diagnosis, treatment and prevention of many diseases. NCBI stands at the crossroads of this revolutionary development in understanding the human genome and translating that knowledge into improvements in human

health. It is a national resource for comprehensive molecular biology information, responsible for developing public databases of sequence information and associated data mining tools. The success of the Human Genome Project and other genome mapping activities are generating enormous amounts of data which, combined with disease- and organism-specific collaborative projects with the world's scientists, are placing accelerating demands on NCBI. Because of this, NCBI's need for additional resources and facilities is especially critical.

When it was founded in 1989, NCBI had a staff of 12 people. Today, that number exceeds 335. Staff growth is expected to continue, and the burgeoning NCBI staff will be housed in the new building, already christened NIH Building 38B.

As NLM Director Dr. Donald A.B. Lindberg sees it, "The rapid growth of the NCBI is a major driving force behind the new facility. Molecular biology in the 21st century will be the fount of cures for many heretofore incurable diseases; the Library and the NCBI will be at the heart of this revolution."

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NLM and Its Antecedents: Where Has the Library Been Housed?

1862-66:

Riggs Bank Building
15th Street and Pennsylvania Avenue, NW
Washington, DC

1866-87:

Ford's Theatre
513 10th Street, NW
Washington, DC

1887-1962:

Army Medical Museum and Library Building
7th Street and Independence Avenue, SW
Washington, DC

1962-present:

National Library of Medicine, Building 38
National Institutes of Health Campus
Bethesda, MD

1980-present:

Main Library Building (38) and
Lister Hill Center, Building 38A
National Institutes of Health Campus
Bethesda, MD



Something for Every Body

Dream Anatomy Exhibition Highlights the Human Form

Did you ever see a dream walking? Well, we did.

Like a skeleton posing with a rhinoceros. Or another examining his own foot. Or a human form holding up a shroud which, upon closer examination, turns out to be his skin. Or a hologrammatic strong man who, like the mythical Atlas, carries the weight of the world.

These unforgettable images and many more are part of *Dream Anatomy*, an NLM exhibition featuring rare anatomical books, illustrations and sculptures spanning the last five centuries. Drawing largely on the NLM historical collection, *Dream Anatomy* also showcases the work of 20th and 21st century artists, including two six-foot Plexiglas books of the Visible Humans and interactive anatomical displays.

The show opened Oct. 9th and will continue through July 31, 2003.

Since A.D. 1500, when illustrations of human anatomy first began appearing in print, artists have employed fantastic settings, bizarre juxtapositions, mischievous poses, intense colors and fanciful metaphors, to display scientific knowledge of the body and its interior—a “dream anatomy” that reveals as much about the outer world as it does the inner self.

“Who we are beneath the skin amazes, scares, entertains, repels, fascinates and inspires us,” said NLM Director Dr. Donald A.B. Lindberg, himself a pathologist.

“But what many people might not realize,” continued NLM historian and *Dream Anatomy* curator Dr. Michael Sappol, “is that art and the artistic imagination have always been an essential part of the science of anatomy. There was a spirit of play that pervaded early anatomical books.”

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Juan Valverde de Amusco (ca. 1525 - ca. 1588) [anatomist]

Anatomia del corpo humano . . . Rome, 1559. Copperplate engraving. National Library of Medicine. A flayed cadaver holds his skin in one hand and a dissecting knife in the other. The skin's distorted face has the appearance of a ghost or a cloud, suggesting that spirit has been separated from, or peeled off of, the fleshy inner man.

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He also notes that, with the completion of the new building, NLM's workforce, currently scattered in several buildings on and off the NIH campus, will be gathered together again in the NLM complex.

Besides giving NCBI an identifiable space as the major part of the new building, the expansion plans:

- Allow all of the original NLM building to be designated for storage of and access to the collection;
- Allow the Lister Hill National Center for Biomedical Communications to more fully utilize its existing building;
- Create a "Collaboratory"—a central facility for collaborative research equipped with advanced technology for the common use of all components; and
- Create significantly enhanced public spaces, such as an exhibition space, a Visitors and Innovation Demonstration Center, and a cyber café.

The architectural scheme shown in the sketch accompanying this story would create a new entrance to the Library that harmonizes three separate buildings created decades apart into a unified NLM campus.

NLM Deputy Director Kent A. Smith, who has played a key role in the planning process for the NLM expansion, points out that "This is an elegant design that effectively integrates into one unified whole the separate elements of the Library. It is a fitting design for medicine's 'Library of the 21st Century.'"

So, what needs to happen next, to ensure the completion of the NLM expansion project?

The U.S. Senate was encouraging when, earlier this year, it issued the following Report Language:

Many of the most serious diseases have a molecular basis. The NLM's National Center for Biotechnology Information is an integral player in this research process, for it organizes and analyzes the vast volume of genomic information uncovered in the last decade. The Congress believes that if this Center is to make maximum contributions to our fight against disease, it must very soon have expanded facilities to meet the growing demands being placed on it.

The Senate called for a report in April 2003 delineating the features, estimated cost and construction schedule for the facility. The current design drawings are scheduled for completion in July or August of 2003. Construction of the new facility is expected to cost approximately \$165 million and will take about three years.

NLM Visitors Center to Close for Renovation

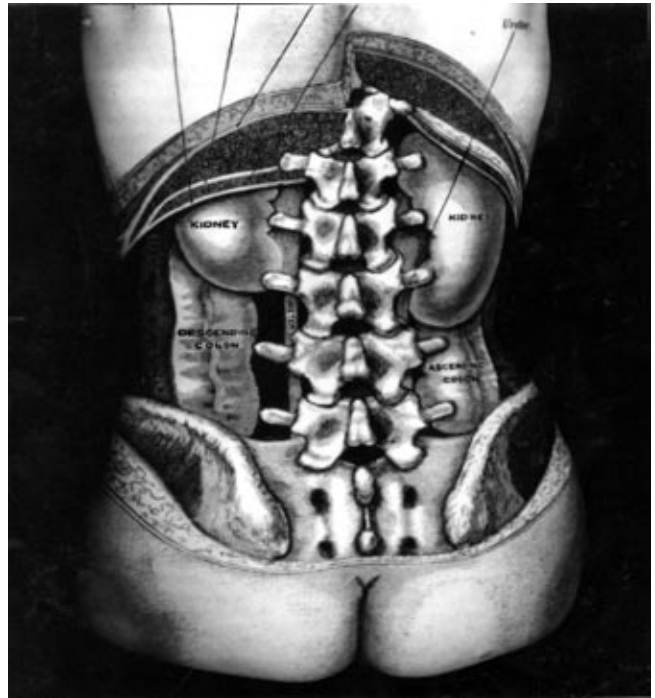
The NLM Visitors Center will be closed for remodeling until Mar. 7, 2003. The new and improved Visitors Center will be larger and will feature new interactive displays highlighting NLM programs and services. Throughout the construction, the Library will continue to offer abbreviated

tours, originating in the first floor lobby of Building 38A, the Lister Hill Center, weekdays (except Federal holidays) at 1:30 p.m. We will also do our best to accommodate special tour groups. For more information, please contact Melanie Modlin at 301-496-7771 or mm354i@nih.gov.

Dream Anatomy



Albrecht von Haller (1708-1777) [anatomist]
C.J. Rollinus [artist]
Icones anatomicae. Göttingen, 1756. Copperplate engraving. National Library of Medicine. Contemporaries praised the Swiss anatomist Haller for his finely detailed illustrations of finely dissected subjects. This dissection of the arteries of the face was copied and reprinted in numerous other works of anatomy.



Katherine DuTiel (b. 1961) [artist]
Inside/Outside: Back. San Francisco, 1994. Photograph. National Library of Medicine. Katherine Du Tiel makes photographs of living bodies covered with projected anatomical images—a playful exploration of our continual attempts to synthesize the two, or perhaps an ironic comment on the impossibility of synthesis.

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A standout object in *Dream Anatomy* without question is *De Humani Corporis Fabrica* [On the Fabric of the Human Body] (1543), considered by many to be the first modern anatomy text. Created by anatomist Andreas Vesalius, this 600-page work is beautifully illustrated with woodcuts by artists from the workshop of Italian master Titian. A computerized version of the book allows viewers to thumb through this masterpiece virtually, viewing its illustrations and learning the stories behind their creation.

Dream Anatomy can be viewed in the first floor exhibition space of Building 38, the National Library of Medicine, Monday through Friday, 8:30 a.m. to 5:00 p.m., with extended hours (until Memorial Day) Thursdays till 9:00 p.m. The exhibition can also be viewed Saturdays from 8:30 a.m. to 12:30 p.m.

A web version of *Dream Anatomy* is located at www.nlm.nih.gov/dreamanatomy.



Govard Bidloo (1649-1713) [anatomist]
Gérard de Lairesse (1640-1711) [artist]
Ontleding des menschelyking lichaams.... Amsterdam, 1690. Copperplate engraving with etching. National Library of Medicine. Bidloo's realistic anatomy has affinities to *trompe l'oeil* and still life, two popular genres of 17th century Netherlandish painting.

MEDLINEplus Now Speaks Spanish

NLM's Popular Consumer Website Now Available "en Español"

MEDLINEplus, the National Library of Medicine's consumer-friendly health website, now speaks Spanish! The new site is at medlineplus.gov/esp.

Recent surveys show that more than 50% of adult Hispanics in the U.S. use the Internet. More than half of those, in fact, look to the Web for medical and health information. This growing audience was the impetus for launching MEDLINEplus in Spanish. Now users will find many of the authoritative, full-text resources that are available on MEDLINEplus "en español," too.

"A primary part of NIH's mission is to translate medical advances into health information that the public can use," said NIH Director Elias A. Zerhouni, MD. "Making MEDLINEplus information available in Spanish greatly expands NIH's ability to carry out its mission to communicate with the public."

MEDLINEplus, available free of charge 24 hours a day, debuted in October 1998. Today the site features over 560 health topics and sees over 1 million visitors per month. The Web address for MEDLINEplus is medlineplus.gov.

In the Spanish version, hundreds of topics point users to appropriate, credible information from NIH and other federal agencies, plus professional medical associations and health-related organizations. On the medical encyclopedia pages, full-color illustrations and photographs accompany over 4,000 articles on diseases, injuries, tests and surgeries. The interactive health tutorials—narrated guides to various health topics—use animated illustrations and plain language to describe medical procedures, surgeries, and the symptoms and effects of disease.

Non-Spanish speaking doctors, nurses, librarians and others looking for Spanish language materials for their patients and clients will find the new service especially useful. A single click of the "español" link will take users from the English MEDLINEplus page to its corresponding Spanish page.

Project directors for "MEDLINEplus en español" were Paula Kitendaugh, Systems Librarian, Public Services Division, and Dianne Sun, Computer Specialist in the Office of Computer and Communications Systems, and Technical Lead for MEDLINEplus.

MEDLINEplus®
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BIBLIOTECA NACIONAL DE MEDICINA DE EE.UU.
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U.S. National Library of Medicine | National Institutes of Health | Department of Health & Human Services
Actualizado: 09 diciembre 2002 | Dirección de esta página: <http://medlineplus.gov/spanish/>

<http://medlineplus.gov/spanish/>

Taking It to the Streets With Tox Town

*SIS's Website Shows Consumers What Chemicals
Could Be Lurking in Their Everyday Lives*

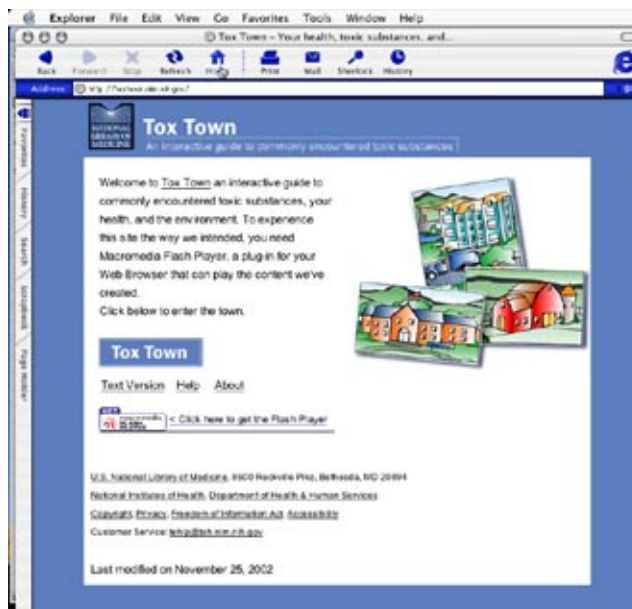
Ever wonder about the health risks that might be posed by a nearby factory? Are there substances in your drinking water that are doing you more harm than good? If you've heard that a particular chemical has been dumped near your home or office, is there some way to find out about its effects?

A new website, Tox Town (toxtown.nlm.nih.gov), can help answer these questions and many more. Released Oct. 7, 2002, Tox Town is a pilot project of NLM's Division of Specialized Information Services (SIS). Tox Town looks at an ordinary town and points out many environmental hazards that might exist there. Users can click on a town location, like the school, and see a dollhouse-style cut-away view of that building. Toxic chemicals that might be found in the school are listed, along with links to selected Internet resources about school environments. In this first release, Tox Town gives information on eight chemicals and eleven locations in an imaginary small town. Future plans to expand Tox Town include adding more chemicals and adding new scenes, such as an urban community and a farming region.

Dr. Jack Snyder, SIS Associate Director, notes that NLM has long been in the forefront of meeting toxicologists' and researchers' information needs with the resources of the TOXNET family of databases. "With Tox Town, SIS can now supplement those resources with a website designed to bring the same quality information to a general audience."

Marti Szczur, Deputy Associate Director of SIS, has spearheaded that office's recent efforts to use the Internet to engage the interest of consumers in learning about toxic chemicals and environmental health. "By using animation, sound, color and compelling visual design, we hope students, teachers and the public will be attracted to learning more about their health and how it can be affected by the environment."

SIS's Office of Outreach and Special Populations developed Tox Town as part of its mission to address the health information needs of minority and other groups in the U.S. who are medically underserved. Gale Dutcher, head of the Office, observed "Many may also live in substandard hous-



The park? The factory? Your office? Your drinking water? To learn what toxic chemicals might be lurking, take a virtual stroll through NLM's new Tox Town.

ing or live and work in communities close to environmental hazards. We hope Tox Town can guide interested citizens to the information they need to understand what hazards may be in their environment."

For further information, please contact Cindy Love, Office of Outreach and Special Populations, SIS, NLM, by e-mail (cindy_love@nlm.nih.gov) or by telephone (301-496-5306). Comments on Tox Town can also be sent to tehip@tehip.nlm.nih.gov.

Thanks to Cindy Love, Technical Information Specialist with SIS, for contributing this article.

“Identification is Completed”

NLM Goes High Tech with Iris Scanners and Hand Geometry Security Devices

Have you every walked by the NLM computer room and heard a voice say, “Identification is completed”? If so, you now know that “Mission Impossible,” or something close, has invaded the Library.

No, Tom Cruise is not hiding behind the glass wall, but the biometrics technology portrayed in his movies is no longer merely the “sci-tech” of Hollywood. It is now an everyday part of life in the NLM Computer Facility.

Since the terrorist attacks last year, biometrics has become one of the hottest technologies used for security by verifying that individuals are who they say they are. But, the Office of Computer and Communications Systems (OCCS) had been investigating biometrics long before the tragedies of September 11th. They are at the forefront of technology R&D and biometrics fits the bill. The September 11th events simply solidified the necessity of further securing NLM’s network infrastructure and biomedical databases.

Biometrics is an automated means for the authentication of identity, based on an anatomical or physical characteristic

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Here NLM’s Helen Garton, not Tom Cruise, puts the computer room iris scanner to the test. Her glasses won’t interfere with the identification process.

NLM and Internet-2 Give a Glimpse of the Practice of Medicine in the Future

Applications Include Breast Cancer Treatment, Surgical Simulations and Disaster Recovery of Medical Records

Demonstrations of the newest, fastest Internet technologies around and their potential for improving the delivery of health care in America took place Dec. 3rd at an NLM-sponsored press briefing held during the annual Radiological Society of North American (RSNA) meeting, in Chicago, Illinois.

The Metropolitan Research and Education Network (MREN) provided a high-speed link from the meeting site to the nationwide Internet-2 backbone network, an infrastructure allowing radiologists and members of the press to get hands-on experience with high performance networking applications that hold promise for the future of medical education and practice, including the fight against breast cancer.

“Computers are rapidly revolutionizing how medicine is taught and practiced in the United States and throughout the world,” remarked NLM Director Donald A.B.

Lindberg, MD. “At this event, the public had a chance to preview what was coming through the digital pipeline,” he continued, “And to get a glimpse of the future practice of medicine.”

Attendees saw how new technology can convert two-dimensional images into three-dimensional models, thus permitting surgeons to rehearse patient-specific surgery, how sophisticated videoconferencing can be used for collaboration and education, and how advanced networks will make possible the storage and retrieval of vast amounts of vital medical information and images across multiple sites in ways never before possible.

“By overcoming some of the limitations of today’s Internet, high performance networking enables exciting new possibilities for medical education and practice,” said Douglas Van Houweling, President and CEO of Internet-2, a consortium of over 200 U.S. universities working with

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Prevention Pays

NLM/PAHO Partnership Helps Central American Health Professionals Get Information Before Disasters Strike

When Hurricane Mitch slammed into Central America in fall of 1998, it was the Atlantic basin's fourth strongest hurricane ever. Sustained winds that peaked at 180 miles per hour hit Honduras and Nicaragua hardest, leaving more than 8,000 dead and 9,000 missing. Many others were injured.

In January 2001, an earthquake registering 7.6 on the Richter scale struck El Salvador. Tragically, a second earthquake followed in February. More than 1,000 people died and over 650,000 were left homeless. The events raised many health concerns, such as coping with resulting injuries, threats to sanitation, and disease.

The countries of Latin America and the Caribbean vie for the unfortunate distinction of having the greatest exposure to disasters of all regions in the world. Between 1971 and 1995, 1,824 disasters were recorded in the Americas, of which 1,246 were produced from natural phenomena. Honduras, Nicaragua, and El Salvador are among the poorest countries in the region and therefore have the greatest need for assistance. Access to current, reliable health information is crucial for disaster prevention and preparedness planning. It is also essential during disaster response and recovery.

Soon after Hurricane Mitch, NLM joined with the Pan American Health Organization (PAHO) to strengthen the local and national health information infrastructures in Honduras and Nicaragua. In September of 2000, the Library awarded a contract to the Foundation for the Coordination of Information Resources for Disaster Prevention (Spanish language acronym "FundacRID"), a non-governmental organization, to help Honduras and Nicaragua develop a system for collecting, organizing and disseminating health information related to disasters. Following the earthquakes in 2001, El Salvador was added to the project.

FundacRID, based in Costa Rica, operates a Regional Disaster Information Center (CRID) for Latin America and the Caribbean. Founded in 1994, CRID is supported primarily by the PAHO and the United Nations International Strategy for Disaster Reduction. CRID works to promote the development of a disaster prevention culture in Latin American and Caribbean countries through the compilation and dissemination of disaster-related information, and by encouraging cooperative efforts to improve risk management in the region. NLM is relying on CRID's expertise, both with information management and working with all of



Librarians and computer specialists at the third training course for the project. It took place in September 2002 at the Centro de Investigación y Estudios en Salud (School of Public Health) of the Universidad Nacional Autónoma de Nicaragua in Managua. NLM's Stacey Arnesen stands third from left in the front row.

the Central American countries, in having them serve as the focal point of this project.

The goal of the NLM-supported Central American Disaster Health Information Network is to promote disaster reduction by capacity-building activities in the area of disaster-related information management. The target countries have established local Disaster Information Centers to collect, organize, store, and disseminate public health and medical information related to disasters. These centers will assist health professionals, government agencies, and non-government organizations in their countries quickly access vital information that was previously unavailable. The selected sites are:

- The Medical School of the at the National Autonomous University of Honduras (UNAH), in Tegucigalpa, Honduras;
- The Centro Universitario Region Norte (CURN), the UNAH campus at San Pedro Sula, Honduras;
- Centro de Investigacion y Estudios de la Salud (CIES), the school of public health of the National Autonomous University of Nicaragua (UNAN), in Managua, Nicaragua;
- The Medical School of National Autonomous University of Nicaragua (UNAN) in Leon, Nicaragua;

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NLM/PAHO Partnership

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- The Health Documentation and Information Center of the Ministry of Health and the Pan American Health Organization in San Salvador, El Salvador;
- The Medical School of the University of El Salvador in San Salvador, El Salvador; and
- The Center for the Protection Against Disasters, a non-governmental organization in San Salvador, El Salvador.

This novel initiative, which began two years ago in Honduras and Nicaragua, is now established and successful. The selected libraries and organizations have the knowledge, training, and technology resources to operate as reliable information providers to health professionals and others in their countries. The four project sites in Honduras and Nicaragua are already providing valuable disaster information services to their communities. The three sites in El Salvador were officially added in spring 2002 and became operational in fall 2002. Participating libraries and information centers have been strengthened in the following areas:

Technological Infrastructure

Victor Cid of NLM's Office of Computer and Communications Systems worked with computer specialists at CRID and the participating sites to develop an appropriate technological infrastructure for the project. Each of the Disaster Information Centers consists of a server, two computers, an uninterruptible power supply, and a scanner. Each site also has a reliable 128K connection to the Internet. Although this may appear to be a slow connection, it is a major improvement for the sites, one of which had no Internet access before this project. The servers allow the Centers to implement a website and online databases. In addition, the equipment and Internet connection at CRID were also upgraded.

Information Management

Over the past two years, the health science librarians have attended three training courses held in Costa Rica, Bethesda, MD, and Nicaragua. These three training courses have prepared the librarians to develop and manage collections of health-related disaster information, access various online resources (including NLM databases), create and maintain websites and databases, and create and provide access to electronic documents.



Victor Cid, NLM, right, and John Scott, Center for Public Service Communication, near the Momotombo and Momotombito volcanoes in Nicaragua.

Information Product Development

During the past six months, each of the sites in Honduras and Nicaragua developed their own local websites for the project. These websites describe the project, provide links to important disaster-related databases and other resources available from CRID, health resources from NLM and the Latin American and Caribbean Center on Health Sciences Information (BIREME), and local resources.

CRID, with NLM assistance, also has been responsible for developing procedures to create a digital library of key documents related to health and disasters. CRID now has a library of over 500 full-text documents that are available on their website and also from each of the participating sites. Over the next six months, CRID expects to double the size of the digital library. These documents primarily include technical reports and assessments concerning disasters and the management of health systems, health facilities, infectious diseases, environmental health (clean water, sanitation), and humanitarian assistance. Many of the documents were prepared by government agencies, the World Health Organization, Pan American Health Organization, and other non-governmental organizations.

The response of the participating sites has been tremendous. Dr. Cecilia Garcia, Director of the UNAH Medical School Library in Tegucigalpa, Honduras credits NLM for the modernization of the medical school library. NLM, in turn, credits Dr. Garcia for using this project as a catalyst to encourage the university administration to provide additional support for the library. Before the project began, the medical school library had only one computer with access to the Internet. At CURN, in San Pedro Sula, Honduras, there were no computers with Internet access. Now the medical

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Fredrickson Papers Added to *Profiles in Science*

Memorial Service Celebrates Life of Former NIH Director

The papers of former NIH director Dr. Donald S. Fredrickson have been added to *Profiles in Science*, an NLM website dedicated to documenting the lives and works of prominent 20th century biomedical scientists.

Fredrickson discovered the relationship between cholesterol and heart disease, and headed NIH from 1975 to 1981.

Dr. Fredrickson, who died in June, was remembered as a scientist, statesman and humanitarian by colleagues at a memorial program in NIH Natcher Auditorium on Oct. 18. The occasion was marked by the addition of his papers to the NLM collection.

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Attending the Oct. 18 service in memory of the late Dr. Donald Fredrickson are (from l.) NIH director Dr. Elias Zerhouni, Fredrickson's son Rurik, the director's wife Dr. Nadia Zerhouni and Fredrickson's widow Henriette.

NLM/PAHO Partnership

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school library has 10 computers and CURN has seven computers. Dr. Garcia has also improved other library services, such as document delivery, by joining the WHO-sponsored Health InterNetwork Access to Research Initiative for free online access to over 1,500 scientific journals.

All of the participating sites are now working to market the services of their Disaster Information Centers to health professionals and others working in disaster prevention and mitigation activities. They have taught courses and conducted demonstrations for government agencies, non-governmental organizations, and hospital and university staff. In addition, Mr. Roberto Matute, CURN Library Director, has brought teachers and students to the Disaster Information Center to teach them about information resources for disaster reduction activities. Some of the students attending the training sessions were orphaned during Hurricane Mitch.

José Antonio Fúnez, a professor of Hispanic-American Literature, considers the Disaster Information Center at CURN "an indispensable consultation and research resource for the university and the community in general. Since we live in a zone of constant risk, it is necessary that we live informed about disasters and that we know how to prevent them".

In the long term, the establishment of these disaster information centers should facilitate the development of improved disaster prevention and mitigation activities in the participating countries. Not only will this positively affect health by providing access to timely and accurate health information, it can also, over time, contribute to economic growth and social development.

In addition to assisting several countries rebuild their health information infrastructure, Project Coordinator Stacey Arnesen of NLM's Specialized Information Services branch also notes that NLM will benefit. "This project will assist NLM in developing models for collecting and exchanging health information in geographically isolated and disaster-prone environments and for handling non-traditional or unpublished literature, in this case on the health aspects of disasters."

Visit CRID's website at:
www.crid.or.cr/crid/Indexen.htm.

Thanks to Stacey Arnesen, Technical Information Specialist with SIS, for contributing this article.

Need Help Selecting and Using NCBI's Resources?

New NCBI Web Feature Provides a Starting Point for Using NCBI Resources

Choosing from among all the tools available in the National Center for Biotechnology Information's arsenal of data mining software can be overwhelming. In some ways, it's like going to an ice cream parlor and making your selection without being able to taste the different flavors. You can see all the different choices, but sometimes it's hard to know exactly which flavor is the one you want.

Often, the only way a user can determine which of NCBI's data mining tools is right for the job at hand is to examine the online software documentation. Although the documentation for NCBI's software tools is excellent and comprehensive, it can be very long due to the complex nature of these tools. As a result, the novice user can get lost or confused, and start-up time may be longer than anticipated.

The "Getting Started" series is designed to be a quick guide to aid the general public and the scientific community in selecting and using NCBI's publicly available resources. Getting Started is located at <http://www.ncbi.nlm.nih.gov/About/outreach/gettingstarted/index.html> and provides:

- An easy introduction to NCBI resources and a clearly defined starting point from which to conduct online research for members of the general public with an interest in bioinformatics; and
- A transition point between theoretical knowledge and its practical application for members of the scientific community who understand some of the theoretical aspects of NCBI's resources.

Getting Started does not attempt to discuss the principles behind the methods used in NCBI resources, and will not explore all alternative approaches that might be used when working with a particular NCBI resource. Instead, each unit of the Getting Started series provides the user with:

- A brief description of the kind of data that can be found/manipulated using a particular NCBI resource;
- Navigation shortcuts;
- Concise explanations of resource graphics;
- Techniques for conducting database searches; and
- Examples of tool usage.

The first unit covers NCBI's dbSNP FTP site, and shows prospective users how to find up-to-date, downloadable, SNP and organizational tools located in dbSNP FTP. In addition, dbSNP FTP Getting Started provides suggestions for how the data and tools located in the site may be used for conducting extensive searches of the latest dbSNP data with a user's own computers and computing tools.

The information provided by Getting Started will give the novice user a starting point for conducting research using NCBI resources that will work efficiently and that will be easy to use.

Thanks to Adrienne Kitts, a freelance writer under contract to NCBI, for submitting this article.



NLM and Internet-2 Give Future Glimpse

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industry partners and federal agencies to create a faster, smarter Internet. He added, "Though we are just beginning to explore the potential of an Internet that is both faster and more reliable, new network applications already show promise of allowing doctors, students, and patients to work more effectively together."

Michael J. Ackerman, PhD, NLM's Assistant Director for High Performance Computing and Communications, agrees, saying, "Internet-2 and the NLM are making possible great advances in medical education by developing the means for physicians to practice or simulate a surgical procedure in a secure environment where mistakes do not adversely affect patients, and by creating the tools to speed vital life-saving information anywhere in the world."

The press briefing demonstrated some of the remarkable uses of advanced networking already under way at universities nationwide. These included:

- **Faster and More Effective Breast Cancer Treatment.** Known as the "National Digital Mammography Archive," this multi-site project led by the University of Pennsylvania, and including the Universities of North Carolina, Chicago, and Toronto, tests the network's ability to store and retrieve vast numbers of high-quality digital mammograms from remote sites. Nothing would make a radiologist's or breast cancer researcher's job easier than to have access to mammogram images stored at multiple sites from a single location. Moreover, a woman can move from one part of the country to another and her new radiologist can instantly access her past mammograms over the network to compare with the current mammogram. Cumbersome files will no longer have to be mailed.
- **Anatomical and Surgery Simulation Over the Internet.** This project, led by researchers at Stanford University, shows how surgical techniques can be taught over high-performance networks using haptics. "Haptic" means the ability feel shape, texture, and density through a simulated environment. For example, a master surgeon at one location can "trace" the correct surgical technique on the computer and have it recorded. A student hundreds of miles away can receive this rendering and have the computer guide his or her hand several times according to the master surgeon's recording.
- **Surgical Planning in a 3-D World.** In an endeavor known as "Advanced Biomedical Tele-Collaboration," researchers at the University of Chicago project focus on using three-dimensional (3-D) imaging for surgical planning and distance learning and employ video-conferencing techniques among multiple locations. Researchers on this project have invented software that converts 2-dimensional images into 3-D models.
- **Disaster Recovery of Medical Records.** Known as "Internet-2 Performance for Medical Imaging Applications," this project, led by researchers at Children's Hospital in Los Angeles, is similar to radiological grand rounds except that the radiologists can be hundreds of miles apart as they view the same x-ray online. It allows large medical images to be retrieved quickly and accurately viewed online.

Fredrickson Papers Added to *Profiles in Science*

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"Fredrickson's studies of the connection between lipids and heart disease made him one of the most widely cited physiologists of the 1960s and 1970s, and highlighted the benefits of a healthy diet," said NLM's Dr. Alexa McCray who heads the *Profiles in Science* project, located at www.profiles.nlm.nih.gov. Credited with the major addition to NIH Clinical Center, Fredrickson also successfully steered NIH through the rough political waters of recombinant DNA research, a hot-button issue during his directorship.

The online exhibit about Fredrickson features correspondence, diaries, unpublished manuscripts, published articles and editorials, photographs and audio recordings illustrating his life and career. Visitors to the site can view, for example, his childhood scrapbook, as well as extensive documentation relating to the regulation of genetic research and to government funding for biomedical research in a time of fiscal constraints. An introductory exhibit places Fredrickson's accomplishments in historical context.

Saving the Books

War Against Insects, Acid and Age Waged at NLM's Conservation Lab

In November of 1966, the Arno River overflowed its banks and flooded much of Florence, Italy. The results were catastrophic. Many of western civilization's greatest art objects and finest books—illuminated manuscripts, rare editions and other one-of-a-kind volumes—were covered with mud, water, silt and raw sewage.

Within days, hundreds of students and conservators from all over the world descended on the city to help with the restoration and scrape off the muck. They were known as “mud angels,” and their efforts not only helped save the priceless books and manuscripts but also focused worldwide attention on the merits of conservation and restoration.

“It doesn't surprise me that so many people flocked to Florence to help salvage the books,” says Carol Clausen, who is in charge of conservation efforts at NLM's History of Medicine Division. “Saving books is akin in many people's minds to saving civilization itself. Early books provide a tangible connection to our past,” notes Clausen.

The National Library of Medicine houses many old and rare printed works—about 500 books and manuscripts printed before 1501 and 70,000 printed before 1801. The Library also owns some of the world's rarest medical manuscripts and letters—handwritten correspondence from such notables as Florence Nightingale and Louis Pasteur, for example. The prints and photographs collection is immense, numbering over 60,000 items.

But, surprisingly, it's the books printed in the 19th century that are often most in need of repair. Many of the books that are 400-500 years old are in pristine condition, observes Carol Clausen. Before the 19th century, paper was made by hand, primarily from cotton and linen, both of which have long fibers and good chemical stability. The pulp was vigorously beaten by hand, which meant the long fibers became extremely interlocked and intertwined, making for a strong sheet of long-lasting paper.

But by the 19th century, paper was machine-made and often contained wood fibers. Wood fibers were rather short and acidic to begin with, but bleaching, the introduction of acids and alum-rosin sizing in the pulp making process greatly increased the acid content of the sheet. The mechanical production of the paper also meant that the short fibers were not as enmeshed. The result: a much weaker paper, prone to brittleness over time.

“Not only does time take a toll on paper,” says Rachel-Ray Cleveland, the rare book conservator in the Library's conservation lab, “But mold, light, temperature, dust, soot and insects also damage it.” Cleveland, who holds a master's degree in conservation, brings a rich experience to her projects. She has repaired the 18th century woodblock paper in



Rare book conservator Rachel-Ray Cleveland prepares a solution to reduce acid in a 19th century document.

the White House's Diplomatic Reception Room. She has conserved works of art by eminent African American artists such as Jacob Lawrence and Elizabeth Catlett, in the Barnett Aden Collection. She has also treated the works of celebrated printmakers, including Picasso.

But despite the fact that Cleveland restores great art, book conservation is as much a science as an art, and her conversation is peppered with such scientific terms as “pH balance,” “alkaline bath solutions,” “chemical and physical stabilization” and “adhesive science.”

Too much acid in a book's pages, thus making them brittle? Cleveland submerges the page in an alkaline bath and watches the yellowish-brown chemicals move out of the paper and into the water.

Mold on the pages? Rather than use chemicals to kill the spores (they would also damage the paper), Cleveland uses a gentler treatment that kills the plant but allows the spores to remain on the paper.

“The spores are deactivated and will remain dormant, thus causing no more harm as long as low humidity is maintained in the book's environment,” says Cleveland. But should the moisture level rise, then the spores may become active again and destructive to the paper, Cleveland comments.

The Library also tries to prevent some of the problems of disintegration before they happen. To control for bugs, sticky traps are placed in all the stack areas. Should any insects be captured, they are identified by an entomologist, to see if they eat cellulose (the vegetable fiber in paper), leather or glue. If insects that “eat” books are found, steps are immediately taken to prevent them from infesting the books. “Much of our work in combating insect infestation focuses on controlling the environment,” says Herb Jacobi, the National Institutes of Health entomologist.

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Saving the Books

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“For example, psocids or book lice need high relative humidity to survive. By correcting the moisture problems and aerating the books, the problem can be solved,” explains Jacobi.

Books brought in from elsewhere are checked for insects, as is the packaging that they are shipped in. If pests are discovered, the book is immediately isolated from other books. Insects can often be controlled by nonchemical methods, such as freezing the book (with virtually no damage to it), dehydration, or simply cleaning up the book.

Cleveland must also repair the damage that past conservators and owners have done—when the science of conservation was not as advanced as it is today. She grimaces as she displays a tear in a page from one rare book that was repaired with Scotch tape. It will take an hour or two to remove the tape and repair the rip properly.

Cleveland says she realizes that the next generation of conservators will have more scientific knowledge in their conservation arsenal, and that some of her repair work may be “improved upon” in the future. For that reason, all of her repairs are reversible. If she uses the latest adhesive technique to mend a rip, it can be easily reversed without damaging the



These before (top) and after (bottom) shots show how NLM conservator Rachel-Ray Cleveland was able to repair worm holes, and improve the overall quality, in a Japanese print.

book.

“I have a passion for paper,” says Cleveland, who in her spare time is also a printmaker. “And there’s nothing more satisfying than repairing a damaged print or a page from a rare book and making it whole again.”

Thanks to Judy Folkenberg, Office of Communications and Public Liaison, for contributing this story.

Tips for the Conservation Hobbyist

While most of us don’t own rare manuscripts or illustrations, we often have our own collection of old family photographs. The following tips, says Rachel-Ray Cleveland, can help preserve your photos for future generations to enjoy.

DON'Ts

- Don’t use any type of adhesive (Scotch tape or glue) to stick photographs to a photo album or scrapbook.
- Don’t expose photos to direct sunlight. If you frame an old photo to hang on the wall, make sure the sun doesn’t shine directly on it. You can also purchase UV (ultra-violet) glass or Plexiglas which blocks UV rays, the most destructive kind.
- Don’t expose your photos to humidity, extreme dryness or wide fluctuations in temperature. Don’t store them in a damp basement or in an attic that’s not well insulated.
- Don’t use “magnetic” photo albums. They are very destructive to photos.

DOs

- Do store photos in an archival box, which you can buy from archival companies.
- Do keep photos in a cool, dry place. In most cases, this means storing them in a bedroom closet—if there’s not a lot of temperature change in that area. Most bedroom closets are temperate—neither too hot nor too damp—unlike attics and basements.
- Do consider mounting the photos with polyester corners or the latest thing in photo album “science,” clear polyester sleeves into which you can slip the photographs. Or, buy archival photo sleeves that fit into three-ring binders.
- Do consider scanning older photos digitally, so you have something other than just the original photo.
- Do consider having a new print made on archivally stable papers.

If you have an old photograph or valuable print that needs major repair, Cleveland suggests finding a professional conservator to restore it. The American Institute for Conservation of Historic and Artistic Works (AIC) is the membership organization of conservation professionals and maintains a free list of professionals who are licensed to do restoration. The organization’s phone number is 202-452-9545. AIC also offers free literature on photographic conservation that can be requested by sending a message to infoAIC@aol.com.

NLM Funds 52 Grants for Internet Access to Digital Libraries

New Program Helps Health Organizations Access Digital Resources

The National Library of Medicine announces 52 awards in its new Internet Access to Digital Libraries (IADL) grant program. The purpose of the IADL grants is to help health-related organizations provide consumers, health professionals and health staff with access to digital health information resources and information services of the highest quality. These projects will use computers linked to the Internet to give access to published articles and books, electronic health records, curriculum materials and scientific knowledge bases.

The FY 2002 IADL awards, amounting to just over \$4 million, will reach consumers and health professionals in more than 330 communities in 25 states and Puerto Rico. Forty percent of the recipient organizations serve rural populations; 17% are in inner city settings. Twenty-eight percent of the projects benefit minority populations and people with special health needs. You can view the FY 2002 IADL awards by following a link to a PDF

file on the Library website, at www.nlm.nih.gov/news/Internetgrants02.html.

NLM recognizes that many health-related organizations, especially smaller ones and those in rural or inner city settings, lack resources to take full advantage of the Internet ability to facilitate informed decision making by health professionals and consumers. The IADL grants help such organizations use the Internet for access to health related information and services provided by NLM and others, to transfer files and images, and to interact by e-mail and videoconferencing with colleagues throughout the world. The grants emphasize the delivery of health information to end-users.

Information about future application dates is available at www.nlm.nih.gov/ep/iadl.html.

Questions about the program should be directed to Dr. Valerie Florance, 301-594-4882; e-mail address: floranv@mail.nlm.nih.gov.

NLM Implements Biometrics

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of a person and an enrolled template of that same characteristic. Unlike a password, PIN (personal identification number) or token device, biometric characteristics cannot be forgotten, lost or stolen and can be used effectively to prevent fraud.

There are two categories of biometric techniques: physiological-based techniques and behavioral-based techniques. The physiological-based techniques include fingerprint verification, iris analysis, facial analysis, hand geometry, wrist veins patterns, ear recognition, odor detection, DNA pattern analysis and sweat pores analysis. The behavioral-based techniques include handwritten signature verification, keystroke analysis and speech analysis.

Iris scanners and hand geometry verification devices have been installed in the Computer Facility and gaining physical access is more difficult since their installation at its three entrance points—the main door, the Network Operations Security Center (NOSC) and the main floor.

The hand geometry devices use the geometric shape of the hand for authenticating a user's identity. Unlike fingerprints, the human hand isn't unique. Thickness, curvature and finger length, as well as a PIN number, are used for the purposes of verification. The scanner disregards surface details, such as fingerprints, lines, scars, and dirt, as well as fingernails, which may grow or be cut from day to day.

The human iris, on the other hand, is unique, even between identical twins and an individual's right and left eyes. Iris recognition technology identifies people by the unique patterns of the iris, the colored ring around the pupil of the eye. It examines more than 240 different fields to create a template. The use of glasses or contacts does not prohibit identification.

Interestingly, iris technology was the recognition technique recently used to identify the Afghan girl who was on the cover of *National Geographic* back in 1985, in a much-publicized wartime image.

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Landmark 15th Century Work Added to NLM Collection

Fasciculo de Medicina Was First Illustrated Medical Book

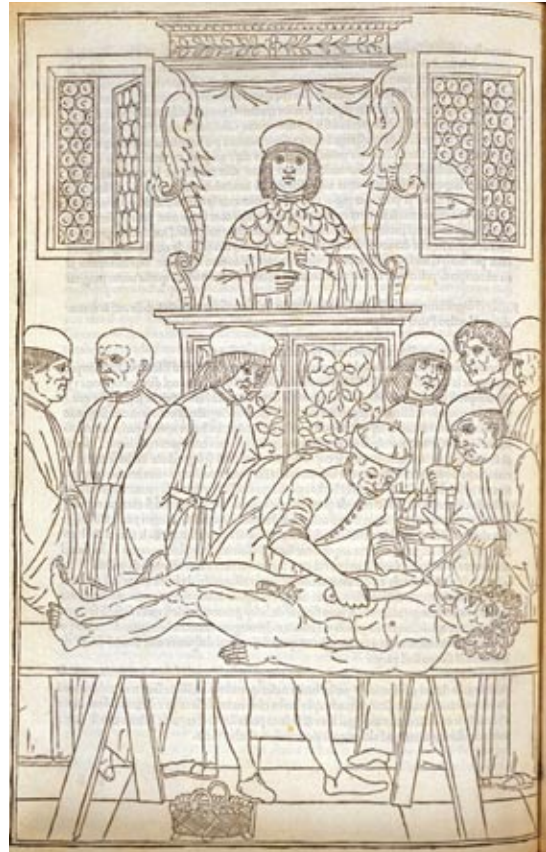
The National Library of Medicine has recently acquired one of the landmark works in the history of medicine. The *Fasciculo de Medicina* ["Fascicle of Medicine"] in *Volgare el Quale Tracta de Tute le Infirmiate del Corpo Humano...*, printed in Venice in 1493/1494, is the first Italian translation of the *Fasciculus Medicinæ*, an anthology of medical writings and the first medical book to contain illustrations. (A *fascicle*, from the Latin word for "bundle," is one of the parts of a book published in separate sections.) Although the Library's collection contains a number of editions of the *Fasciculus Medicinæ*, the 1493/1494 work is now its earliest edition of this cornerstone of medical history.

The *Fasciculus Medicinæ*, first printed in Venice in 1491, enjoyed great popularity among practicing physicians and students of medicine. A number of subsequent editions were printed and it was translated from the original Latin into both Italian and Spanish.

The Italian translation, *Fasciculo de Medicina*, is the first edition to contain additional text and ten full-page woodcuts, which are considered to be among the finest examples of 15th century woodcuts. The famous dissection scene (shown here) begins the *Anathomia* of Mundinus, the first modern treatise on anatomy. The scene shows the professor lecturing from above, while the dissection is carried out by a menial.

The authorship of the *Fasciculus Medicinæ* has long been attributed to Joannes de Ketham. Little is known of de Ketham who has been identified as Hans von Kircheim, a German physician living in Italy. De Ketham collected and edited the medical writings of his time and printed them in the *Fasciculus Medicinæ* in 1491.

Thanks to Margaret Kaiser, Acquisitions Librarian, History of Medicine Division, for contributing this article.



Dissection scene, *Fasciculo de Medicina*

NLM Funds 15 AIDS Information Community Outreach Projects in September 2002

This Year Marks Ninth Round of the Program

NLM has continued its HIV/AIDS-related outreach efforts to community-based organizations, patient advocacy groups, faith-based organizations, departments of health, and libraries. This program provides support to design local programs for improving information access for AIDS patients and the affected community as well as their caregivers. Emphasis is on providing information or access in a way meaningful to the target community. Projects must involve one or more of the following information access categories: information retrieval, skills development, Internet access, resource development and document access.

Awards were made for the following projects:

- AID Atlanta, Inc. - AIDS Information Outreach Project: Using the Internet to Enhance Access to Information, www.aidatlanta.org/home01.htm, Atlanta, GA
- AIDS Education Global Information System (AEGiS), www.aegis.org, San Clemente, CA
- Asian Association of Utah - HIV/AIDS Prevention Plan, www.aau-slc.org, Salt Lake City, UT
- Columbus AIDS Task Force Central Ohio's HIV/AIDS Resource Library (Columbus, OH), www.catf.net, Columbus, OH
- Critical Path AIDS Project Community-Based Internet Connectivity: An AIDS Outreach Project, www.critpath.org, Philadelphia, PA
- Germantown Settlement and The AIDS Library - Expanding Services at an AIDS Library Satellite and Computer Resource Center: An AIDS Outreach Project, www.aidslibrary.org, Philadelphia, PA
- Hope House Day Care Center - Hope for Families Life, www.hopehousedaycare.org, Memphis, TN
- Magnolia Coastlands Area Health Education Center - Southeast Georgia AIDS Info Link, www.mcg.edu/ahec/mcahec, Statesboro, GA
- One Day At A Time, Positive Effects Outreach Ministry and The AIDS Library - Creating Access at the Street Level: An AIDS Outreach Project, www.aidslibrary.org, Philadelphia, PA
- Philadelphia Fight - TEACH OnLine: An AIDS Outreach Project, www.aidslibrary.org, Philadelphia, PA
- Project Reach Youth, Inc. - Project SAFE: Speak-Out on AIDS Facts and Education, www.pry.org, New York, NY
- Regents of the University of New Mexico, New Mexico AIDS InfoNet, www.aidsinfonet.org, Albuquerque, NM
- University of Texas Health Science Center at San Antonio - Web-Based HIV/AIDS Education Resources for High-Risk Youth and Health Care Providers in South Texas, www.uthscsa.edu/commpeidi/, San Antonio, TX
- Utah AIDS Foundation - Sharing Digital Resources: An Interlibrary Partnership, www.utahaids.org, Salt Lake City, UT
- WAM Foundation, Inc. - Community AIDS Outreach Projects, www.wamfoundation.org, Houston, TX

For more detailed descriptions of each project, please go to www.nlm.nih.gov/news/aidsprojs02.html.

NLM Associates Begin 2002-2003 Fellowship Year

Talented Sextet Brings Diverse Educational, Professional Backgrounds

It's a sure sign of fall at NLM when the new cadre of NLM Associate Fellows makes its way to Bethesda each September. The NLM Associate Fellowship Program is an annual internship for recent graduates of Masters degree programs in library and information science. Fellows receive a comprehensive orientation to NLM programs and services, then conduct individual projects in areas of interest. Projects are typically of a research, development, or evaluation nature.

Now, please meet the 2003-2003 Associates Fellows.

Evangeline K. Alexander received her MLIS degree in May 2002 from the University of Hawaii at Manoa, where her studies focused on database design, implementation, and evaluation. She also conducted an internship in science and technology reference, and initiated a project to update a list of public health core literature, modeled after the Brandon/Hill lists. Her professional interests include public health informatics, applying GIS/mapping technology to enhance scientific discovery, and database evaluation. Evangeline has also recently concluded a five-year enlistment in the US Navy, where she served as a cryptologist after completing studies at the Defense Language Institute in Monterey, California. She holds a BA in English.

Marcus A. Banks received his MLIS degree in May 2002 from Dominican University in River Forest, Illinois. He has experience providing reference services, creating databases, and contributing to library policy. While pursuing his *MLIS*, he completed a practicum in the Reference and Bibliography Department of the Northwestern University Library. As the Research and Programming Associate for the American Massage Therapy Association Foundation, he developed and maintained the Massage Therapy Research Database. This searchable database is derived from MEDLINE citations, and is available without charge on the Internet. He is a former member of the Northwestern University Library Committee, which made recommendations to the University Provost concerning library programs and services. His professional interests include information policy, planning and evaluation, and library management. Marcus also holds a BA in English from Northwestern University.



The 2002-2003 Associate Fellows. Seated: Evangeline Alexander (l.) and Natalie Kamper. Standing (l. to r.): Shannon Jones, Michelle Ochillo, Marcus Banks and Molly Cahall.

Molly Cahall graduated in August 2002 with an MSLS from the University of North Carolina-Chapel Hill. During graduate school, Molly worked as a graduate assistant at UNC's Health Sciences Library, where she gained experience in user services and in distance education. Molly was also active in the Health Sciences Library's initiatives on handheld technologies by participating in its Mobile Technologies Working Group, creating an online guide for personal digital assistants (PDAs), and attending various forums and trainings on handheld technology. Molly also has a bachelor's degree in education and an MA in speech-language pathology. She worked for 1.5 years in a subacute/long-term nursing care environment providing evaluation and treatment for adults with communication and swallowing disorders. Molly's current interests include the dissemination of health information via handheld technologies, relational database design and development, and technical issues in library support for distance learning programs.

Shannon D. Jones received her MLS in May 2002 from North Carolina Central University. While working on her degree, she was awarded a 2001 Spectrum Initiative Scholarship from the American Library Association. She has library experience in acquisitions and circulation, as well as experience in journal production. Her professional interests include community and disease-specific outreach

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NLM Classification 2002

New Publication Pattern and Format Introduced

Beginning with the 2002 edition, the National Library of Medicine Classification will be published in electronic form and updated annually. The online environment offers many advantages to users including hyperlinks between class numbers in the index and the schedules, between terms within the index, and hyperlinks links from the Index to the term in the MeSH Browser.

The development of the online data creation and maintenance system used to produce this edition of the Classification gives NLM the ability to update it annually in tandem with MeSH.

The NLM Classification is available for downloading in HTML; see homepage of the Classification (www.nlm.nih.gov/class). Publication of printed editions ceased with the 5th revised edition, 1999.

Scope of Revision

The 2002 edition incorporates all additions and changes to the schedules since 1999. New class numbers were added as needed to reflect changes in MeSH and the biomedical and related sciences literature cataloged. The Index is updated with appropriate MeSH concepts through 2002.

The outlines of all schedules were systematically reviewed and revised, and new ones were developed for schedules where none existed. These outlines provide the user with a quick overview of a schedule's content and assist in maneuvering through one.

Class number names were revised to reflect changes in MeSH application and practices as well as changes in MeSH itself. For example:

1. The class name "Hemodialysis" was replaced with the MeSH concept "Renal Dialysis."
2. The term "Nomenclature" was deleted from all class names, since it is now a see reference to "Terminology" in MeSH.
3. Prepositional phrases used as class names were simplified, e.g., "Nursing of diseases of the respiratory system" became "Respiratory system nursing"

Thanks to Christa F.B. Hoffmann, Head, Cataloging Section, Technical Services Division, for contributing this article.

NLM Associates

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programs, medical informatics, consumer health initiatives and public health informatics. Shannon has a *BA* in English with a minor in computer programming from North Carolina State University in Raleigh.

Natalie J. Kamper received her MLIS in June 2002 from the University of California, Los Angeles. While attending UCLA, Natalie worked as a website Architect at the California Center for the Book. She also worked as a computer support assistant in her department's Multimedia and Information Technology Lab. During her graduate education, Natalie interned at RAND Corporation on a digital resources project and participated in teaching user education classes at USC Norris Medical Library. Natalie's professional interests include web-based medical information services, evaluation, and information policy. Natalie holds a *BS* in kinesiology from the College of William and Mary.

Michelle Hudson Ochillo received her MLIS in December 2001 from Louisiana State University. She has experience medical and public libraries as well as archives, including work at the Jefferson Parish Public Library and Amistad Research

Center in New Orleans. Her professional interests focus on public health and medical informatics, with special interest in developing, implementing, and evaluating outreach programs targeted at consumer health and underserved populations. Michelle is also exploring the impact of the "digital divide" on society and is examining how newly emerging technologies can be utilized to address the issue. She holds a master of social work degree from Tulane University and has four years' experience as a social worker.

NLM would like to thank the library schools and medical libraries for their continued support of the program and their encouragement of outstanding candidates to apply. Applications for next year's program, to begin in September 2003, are now being accepted and the due date is February 14, 2003. Information on the Associate Fellows Program, along with an application, is available in the Training section of NLM's website (www.nlm.nih.gov/about/training/associate/).

Thanks to NLM Associate Program Coordinator Dr. Barbara Rapp for contributing this article.

Participants in Leadership Fellows Program Announced

Inaugural Class Features Rising Stars at Academic Health Sciences Libraries

The fellows and mentors in the inaugural class of the leadership program jointly sponsored by the National Library of Medicine and the Association of Academic Health Sciences Libraries (AAHSL) have been announced.

The NLM/AAHSL Leadership Fellows Program, offered in cooperation with the Association of Research Libraries Office of Leadership and Management Services, focuses on preparing emerging leaders for academic health sciences libraries. The program provides a combination of in-person and online learning opportunities for fellows. Fellows are paired with mentors who are academic health sciences library directors and will visit the libraries of their mentors.

Information about the program is available at www.arl.org/olms/fellows/.

2002-2003 NLM/ AAHSL Leadership Fellows Program Participants

Fellow: **Judy Consales**, Interim Director, Louise M. Darling Biomedical Library, University of California, Los Angeles

Mentor: **Carol G. Jenkins**, Director, Health Sciences Library, University of North Carolina at Chapel Hill

Fellow: **Charles J. Greenberg**, Head Reference Librarian, Cushing/Whitney Medical Library, Yale University

Mentor: **J. Michael Homan**, Director of Libraries, Mayo Clinic and Mayo Foundation

Fellow: **Patricia C. Higginbottom**, Assistant Director for Information and Instructional Services, Lister Hill Library of the Health Sciences, University of Alabama at Birmingham

Mentor: **Judith Messerle**, Countway Librarian, Francis A. Countway Library of Medicine

Fellow: **Gerald J. Perry**, Head of Information Services, Arizona Health Sciences Library, University of Arizona

Mentor: **Nancy K. Roderer**, Director, William H. Welch Medical Library, Johns Hopkins University

Fellow: **Linda J. Walton**, Associate Director, Galter Health Sciences Library, Northwestern University

Mentor: **Wayne J. Peay**, Director, Spencer S. Eccles Health Sciences Library, University of Utah

NLM Implements Biometrics

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Biometrics is a method to ensure that the person who enters isn't merely carrying someone else's access card or PIN. Lost cards must be replaced, but eyes and hands are seldom lost, stolen or forgotten. They can't be shared with others, they don't wear out and they never need to be replaced. Access to the facility used to be by cardkey only, but cards can be lost or stolen or the system could be down. The iris scanner at the main door provides backup security.

The USA Patriot Act (HR 3162), passed by Congress in October 2001, highlights biometric technology as central to the government's heightened security efforts.

"The world's citizens depend on the NLM biomedical

databases for reliable health information," says Dr. Simon Liu, OCCS Director. "Our commitment to the Patriot Act and to our users has spurred our great efforts to safeguard NLM's computer facility and business."

Thanks to Helen E. Garton, Computer Specialist in the Office of Computer and Communications Systems, for contributing this article.

NLM Awards Honor Excellence, Innovation, Length of Service

Standing Room Only Crowd on Hand as Library Honors its Own

The date changed from November to December this year, and the festivities featured a PowerPoint show of employee photos, with uplifting musical accompaniment. But besides those changes, and the presence of new Executive Officer Jon Retzlaff to open and close the proceedings, it was the same NLM Honor Awards ceremony that staff members have come to know and appreciate through the years.

This year's Dec. 4th event, in the Lister Hill Auditorium, saluted excellence, innovation, special achievement and length of service.

Individual and group awards for sustained superior performance or special acts or service went to 157 employees. Forty NLM staffers received length-of-service awards.

Other staff members who had received prizes from prestigious organizations outside the Library were also acknowledged for their achievements.

NLM Director Dr. Donald A.B. Lindberg welcomed the audience and awardees, and sized up 2002 as a year of notable accomplishments. Among these:

- MEDLINE reached 12 million records. Through the PubMed retrieval system, MEDLINE was searched half a billion times in 2002;
- The information services of the National Center for Biotechnology Information (NCBI) continue to expand. For example, GenBank has 15 million sequences and more than 14 billion base pairs from over 100,000 species; it is accessed by some 50,000 researchers;
- MEDLINEplus has emerged as a comprehensive and trusted source of consumer health information and, in 2002, became available en español; and
- Another successful exhibition, *Dream Anatomy*, opened and has received significant press coverage. The following employees received awards in 2002:

NATIONAL INSTITUTES OF HEALTH MERIT AWARDS

Roma P. Samuel, for dedicated support in locating materials and providing reference assistance for researchers and users of the NLM Staff Library.

Catherine R. Selden, for unique and significant contributions to the NLM's Health Services Research Information Program.

German E. Tello, for outstanding productivity and

accuracy as an indexer, reviser, and trainer of new indexers for MEDLINE.

Janice H. Willis, for superior, long-term contributions to the accuracy and quality of the MEDLINE database through extensive examination and intensive testing of data.

Terry S. Yoo, PhD, for continuing support and leadership of the Visible Human Insight Toolkit Project.

PHILLIP C. COLEMAN AWARD

Julia C. Royall, for her outstanding commitment and support to improve accessibility for disabled individuals.

EEO SPECIAL ACHIEVEMENT AWARD

Colette Hochstein, for outstanding support to conduct meetings that accommodate disabled individuals.

NIH DIRECTOR'S AWARD

Kathleen G. Cravedi, for her contributions to NLM's outreach program that have enhanced the Library's reputation for service to the public.

2002 MERIT AWARD, OFFICE OF THE DIRECTOR, NIH

David L. Nash, Elliot R. Siegel, PhD, and Frederick B. Wood, DBA, in appreciation for their efforts in addressing health disparities and recruitment concerns through the successful implementation of the NIH Native American Powwow Outreach Initiative.

BOARD OF REGENTS AWARD

Rodney Long, for the design and development of the Web-based Medical Information Retrieval System (WebMIRS).

FRANK B. ROGERS AWARD

Karen A. Kraly, in recognition of continuing innovative and substantial contributions to NLM's DOCLINE System.

The Tooth Puller (*L'arracheur de dents*)



From the Middle Ages through the early 19th century, tooth pulling was often performance art. Barber-surgeons cut hair, set bones, did bloodletting, and pulled teeth. Toothache could be treated with leeches, blistering, cupping and laxatives, as well as prescriptions of lizard liver, green frogs, and gargling with urine.¹ Opium mixtures were popular painkillers.

When refined sugar became widely available in the 17th century, dental caries became common. For more desperate sufferers, itinerant tooth pullers set up shop in marketplaces and at fairs. The “dentist” and his assistants attracted a crowd by telling stories, singing and dancing, performing tricks, or juggling. The tooth puller’s assistant was usually dressed as a clown or a harlequin, with a pointed hat on which was inscribed the insignia of Saint Apollonia, the patron saint of toothache sufferers.

In more elaborate cases, such as in this image from late 18th century France, the tooth puller (*arracheur de dents*) had a stage as well as two assistants. The music that they provided attracted the crowd and also helped to drown out the cries of the patient. Here, tooth extraction was an essen-

tial part of the entertainment. The public setting provided considerable drama, where the gathered crowd could judge the skill of the “dentist.” If he was smooth enough—if he could extract teeth without causing too much pain—others could then volunteer as patients.

Many artists tried to capture the pomp, pageantry, and pain of early dentistry. This etching was created by Jean Duplessis-Bertaux (1747-1819), a well-known artist and engraver who chronicled many scenes of the French Revolution and the Napoleonic era.

1. James Wynbrandt, *The Excruciating History of Dentistry: Toothsome Tales and Oral Oddities from Babylon to Braces* (New York: St. Martin’s Press, 1998).

By Elizabeth Fee, Theodore M. Brown, Jan Lazarus, and Paul Theerman.

Illustration from the collection of the National Library of Medicine. Column reprinted with permission from the American Journal of Public Health.

Dr. Donald King Named NLM Deputy Director for Research

Physician Has Had Distinguished Career as Executive and Academic

Dr. Donald W. King is the new NLM Deputy Director for Research and Education. He joined the staff Sept. 12.

Prior to his appointment at NLM, Dr. King was Executive Director of the American Registry of Pathology at the Armed Forces Institute of Pathology in Washington, DC. He has held various executive and academic appointments including Director of the Given Institute of Pathobiology, Director of the University of Colorado Medical Center, Dean of the Division of Biological Sciences, University of Chicago, and Dean and Vice President of the Pritzker School of Medicine, University of Chicago. Dr. King received his MD from Syracuse University and completed his internship and residency in pathology at Presbyterian Hospital, New York.

Dr. King is very familiar with the Library, having served as a consultant and member on numerous long range planning panels. He chaired the 1990 Long Range Planning Panel on "Electronic Imaging." This study recommended expansion of the work that became the Visible Human Project.



Dr. Donald W. King

As NLM Director Dr. Donald A.B. Lindberg notes, "Dr. King's esteemed qualifications in the medical community, coupled with his unique knowledge of NLM's programs and services, have prepared him well to meet the challenges of his new position with the NLM."

"AIDS Ephemera" Exhibition Opens

Many Media and Messages Mark New Show

Out of the tragedy of the AIDS epidemic came a vibrant culture of ephemeral art buttons, posters, cards, comic books and the like, designed to educate, motivate, and inspire. Now, NLM has mounted an "AIDS Ephemera" exhibition, occupying the glass cases near the front entrance of Building 38, the main National Library of Medicine building. It continues through May 27, 2003.

Produced by government health departments as well as private organizations, the visual culture of AIDS promoted knowledge of symptoms as well as means of prevention. To convey the public health message as broadly as possible, the material appeared in Spanish and French, as well as English.

To grab attention, artists played with stereotypes of some of the disease's most affected subcultures—gay men in particular. Some of the materials are playful or humorous, while others stress values such as responsibility and compassion.

The exhibit can be viewed during the Library's regular business hours: 8:30 a.m. to 5:00 p.m. on Monday, Tuesday, Wednesday and Friday; 8:30 a.m. to 9:00 p.m. on Thursday;

and 8:30 a.m. to 12:30 p.m. on Saturday. History of Medicine Division staffers Dr. Paul Theerman and Jan Lazarus curated the exhibit, assisted on copyright issues by Belle Waring. Troy Hill from the Audiovisual Program Development Branch designed the exhibit.

This playful work by Keith Haring displays his trademark energy and street art style. Haring himself died of AIDS February 16, 1990.



Jon G. Retzlaff Named NLM Executive Officer

Resume Includes Management Experience at NIH, Appropriations Work on Capitol Hill

Jon G. Retzlaff is NLM's new Executive Officer, replacing Donald Poppke who left the NLM to become acting Director of the Office of Budget, NIH. Retzlaff brings a number of unique skills to the NLM, including serving as a legislative advisor at the NIH, a legislative analyst at the DHHS, and as a professional staff member on both the House and Senate Appropriations Committees. He comes to the Library after completing his MBA as an MIT Sloan Fellow and serving as a Special Assistant to NIH Associate Director Charles Leasure.

Retzlaff came to the NIH in 1993 as a participant in the highly distinguished two-year Presidential Management Intern Program. From 1995-1998, he worked in the Office of Legislative Policy and Analysis, NIH. In 1998, he was detailed to the U.S. House of Representatives Committee on Appropriations. After that assignment, Retzlaff joined the Office of the Assistant Secretary for Legislation at the Department of Health and Human Services. He was appointed senior legislative advisor at the National Institute of Neurological Disorders and Stroke (NINDS) in August of 1999. From NINDS, he was detailed to the U.S. Senate Committee on Appropriations. He helped prepare the fiscal year 2001 appropriations bill and report, and staffed several congressional hearings involving NIH. Retzlaff received



Jon Retzlaff

his MPA from the School of Public and Environmental Affairs, Indiana University, in 1993, and his MBA from the Sloan School of Management, Massachusetts Institute of Technology (MIT) in 2002.

In his role as Executive Officer, Retzlaff provides advice to the Director and other senior staff on administrative management matters and directs the administrative programs, including budget, acquisitions, human resources, space management and travel, as well as other administrative services.

Products & Publications

- The design, organizational structure and search engine of NLM's popular, consumer-friendly database MEDLINEplus (www.medlineplus.gov) changed Nov. 21st. The changes resulted from extensive usability testing, consumer feedback and advances in Web design and standards. The new design retains many elements of the current site, but introduces a three-column home page and a new "In the Spotlight" section. "In the Spotlight" features links to MEDLINEplus content. MEDLINEplus retains the current five categories and adds two new ones: Medical Encyclopedia and News. The categories' descriptions have been modified to include more consumer-friendly language, such as "prescription and over-the-counter medicines."

The new search engine uses concepts as well as search words to find results. Search results are grouped into separate folders for Health Topics, Medical Encyclopedia, Drug Information, and News. In addition, links from the Health Topics pages are also searched.

- MEDLINEplus en español also saw a redesign, incorporating improved navigational features. The site retains the website's three original categories: Temas de Salud, Enciclopedia Médica, and Tutoriales Interactivos.
- NLM has also implemented a new search engine for its main website, www.nlm.nih.gov. The new engine can be accessed from www.nlm.nih.gov/search.html.

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Dr. Jack Snyder Named Head of Specialized Information Services

Multiple Degrees Qualify Him Well for Diverse NLM Division

NLM welcomes Jack W. Snyder, MD, PhD, who is now on board as the new Associate Director for Specialized Information Services. Dr. Snyder received his BS and MD from Northwestern University, a JD from Georgetown University, a Master of Public Health degree from Johns Hopkins University, a Master of Forensic Science from George Washington, and a PhD in pharmacology and toxicology from the Medical College of Virginia.

Prior to joining NLM, Dr. Snyder held various executive positions in private industry including serving as Senior Vice President and Chief Medical Officer for DIANON Systems, Inc., Medical Director, East Region, SmithKline Beecham/Quest Clinical Laboratories, Director of Clinical Laboratories for Wills Eye Hospital, Philadelphia, Pennsylvania, and for the Community Medical Center of Newark, New Jersey. In addition, he has held various academic appointments at the Jefferson Medical College/Thomas Jefferson University, Philadelphia, Pennsylvania. Most recently, he served as Physician, Immediate Health Care, Medical Toxicology-Occupational Medicine at St. Vincent's Medical Center in Bridgeport, Connecticut, as well as consultant to various corporate and governmental entities.



Dr. Jack W. Snyder

As Associate Director for SIS, Dr. Snyder is responsible for providing direction and leadership in planning, developing, and administering a national toxicological and environmental health information program. His office also conducts HIV/AIDS outreach, consumer health information outreach to minority organizations, and training in specialized areas such as children's environmental health. These duties were ably performed on an interim basis by Marti Szczur, now Deputy Associate Director of SIS, before Dr. Snyder joined the NLM staff.

Products & Publications

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- This search method provides users with an easy-to-use categorized listing of search results. These are sorted into four folders: (1) NLM; (2) Health Information—MEDLINE^{plus}; (3) Profiles in Science; and (4) Exhibits. The method lets the user quickly navigate to the desired area of the website.
- NLM has announced a pilot project involving PubMedCentral, the online archive of life science journals managed by the Library's National Center for Biotechnology Information. It will allow free access to back runs of a set of important biomedical journals, thus changing the way many users get access to these journals in the future. In addition, NLM hopes that some libraries can help out by supplying needed issues for scanning. For information or to donate journals, contact Mary Kate Dugan in NLM's Preservation and Collection Management Section at pmcscan@mail.nlm.nih.gov.
 - The 2003 edition of Index Medicus is available by subscription for \$620 (domestic) and \$868 (foreign). Monthly editions are for sale at \$95 (domestic) and \$133 (foreign), and the List of Journals can be purchased for \$45 (domestic) and \$63 (foreign). Finally, the Medical Subject Headings (MeSH) supplement can be bought for \$65 (domestic) and \$91 (foreign). Information on the purchase of these items is available on the NLM website, by clicking on "GENERAL INFORMATION" from the home page (www.nlm.nih.gov), then "Publications, Reports and Plans of NLM."

NLM Retiree

Frances Humphrey Howard Mourned

Sister of Hubert Humphrey was Tireless Activist

Frances Humphrey Howard, 88, a special assistant to the associate director for extramural programs at NLM from 1970 until her retirement in 1999, died of congestive heart failure Sept. 23 at Sibley Hospital, Washington, DC.

The sister of the late Vice President Hubert Humphrey was a force in her own right. At NLM, she worked to improve communication programs for medical research. She organized groundbreaking meetings of voluntary health agency executives, to expose them to the information programs and services of the Library and to encourage greater use of these resources.

Howard was also a gifted liaison to members of Congress, informing them of the coming importance of biotechnology and encouraging the creation of the National Center for Biotechnology Information at NLM. That arm of the Library, charged with collecting, organizing and disseminating knowledge about molecular biology, biochemistry and genetics, has seen tremendous growth in staff size and usage of its online resources since its creation in 1988—especially since the mapping of the human genome.

“Fran Howard was a dynamo,” noted NLM Director Dr. Donald A.B. Lindberg. “The nation, including the NLM, is much indebted to her for her tireless support of scientific research to provide hope for all who need it.”

Raised in Huron, SD, Howard had the Humphrey family gift for public speaking and a seemingly endless capacity to care for people. In more than six decades in Washington, her government service was intertwined with community service on behalf of many organizations. She is credited with helping the Museum of African Art become a Smithsonian museum and she served as a trustee of the U.S. Capitol Historical Society, the National Capital Children’s Museum and the Washington Opera, among many others.

In the early 1940s, she was First Lady Eleanor Roosevelt’s assistant for employee activities in the National Civil Defense Office. In the 1950s, Mrs. Roosevelt tapped her to become a director with the then newly organized United Nations Association. In that capacity, Howard traveled the world, promoting cultural understanding, health care and other causes. She later became a foreign service officer for the State Department, working on projects ranging from sustainable development in Bolivia to birth control in the Philippines.



Frances Humphrey Howard

Especially in the last years of her life, she created strong bonds with people she met and mentored through the Hubert Humphrey Fellows, an international exchange program begun by President Jimmy Carter in 1979, in which professionals from developing countries study in the United States.

Survivors include two children, Minnesota District Court Judge William Howard of Minneapolis, Minnesota, and Anne Howard Tristani of San Juan, Puerto Rico, and five grandchildren.

NAMES IN THE NEWS

RECOGNIZING
AND HONORING
THE NLM COMMUNITY



Beth Weston

Beth Weston has been named Serial Records Section Head in NLM's Technical Services Division, replacing Dianne McCutcheon. The Serial Records Section is responsible for the acquisition, licensing, initial bibliographic control and processing of serials for the NLM collection. For the past two years, Weston has served as head of the Serial Records Section's Acquisitions Unit. She earned her BA in linguistics at the University of California, San Diego, and her MLIS at UC Berkeley. Previous positions included Coordinator of Serials Acquisitions at the University of Delaware and Serials Librarian at the Gelman Library, George Washington University.



Rodney Long accepts the Regents Award from NLM Board of Regents Chair **Alison Bunting**.



Carolyn Tilley

Carolyn Tilley has been named advisor on Unified Medical Language System (UMLS) activities in the Office of the Chief, Bibliographic Services Division (BSD). The position was created to provide coordination of administrative functions, data distribution, training, user support and documentation, and expansion of access to the UMLS. Before assuming her new post, Tilley headed the MEDLARS Management Section of BSD, an office she joined in 1975. As BSD Chief Sheldon Kotzin points out, Tilley has witnessed a revolution in database activity in the course of her NLM career. "She supported MEDLINE searching through value-added networks, Grateful Med disks, Internet Grateful Med and PubMed. She can remember when users had to be trained before they could search; when they had to be 'approved' by NLM before getting a billed user code; when only a few cities had the telecom nodes needed to connect users to NLM computers. Now Internet access is unencumbered to 200,000 users per day at NLM and countless more via services provided by about 180 MEDLINE licensees worldwide."

The 2002 NLM Board of Regents Award for Scholarly or Technical Achievement went to **Rodney Long**, Electronics Engineer in the Communications Engineering Branch of the Lister Hill National Center for Biomedical Communications. He was recognized for the "design and development of the Web-based medical information retrieval system, WebMIRS, an original technical accomplishment that furthers the state of the art in biomedical multimedia database design. The system enables biomedical researchers access to a multimedia database of digital X-rays and textual data as well as serves as a tool for the analysis of data."

NAMES IN THE NEWS....



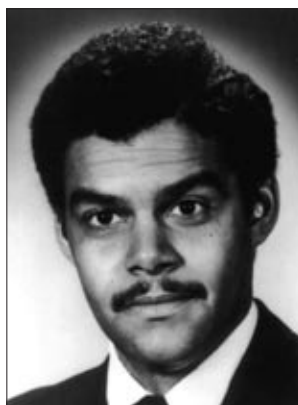
Rose Marie Woodsmall

Rose Marie Woodsmall has retired after more than 34 years of service at the National Library of Medicine. Her career spanned eight US presidents and two NLM directors. After graduation from Indiana University School of Library and Information Service in 1967, she came to NLM as a Library Associate. She found her niche quickly in the Office of Research & Development, which became the Lister Hill National Center for Biomedical Communication, and worked there on the development of AIM-TWX and its successor, MEDLINE, with Davis McCarn. After a few years in the Office of Computer and Communications Services during the early implementation of MEDLINE, Woodsmall moved to the MEDLARS Management Section, where she continued to work with MEDLINE implementation, support and training. In the mid-1980s, she joined the Office of Planning and Evaluation (now the Office of Health Information Programs Development), directing a large-scale evaluation of user-friendly search systems that contributed to the development of Grateful Med. She was also co-chair of the evaluation of the CD-ROM version of MEDLINE. Her final decade at NLM was spent in the National Center for Biotechnology Information, where she provided user support for NCBI's suite of molecular biology and literature databases. Woodsmall always had a special interest in the Library Associate Program and served on the selection committee, participated in Associates' instruction, and mentored many Associates through the years.



Dr. Angela Ruffin

Dr. Angela Ruffin, Head of NLM's National Network Office, has received the Distinguished Alumna Award from the School of Information and Library Science, University of North Carolina, Chapel Hill. She was also the featured speaker at the school's December commencement exercises.



James F. Williams II

Former NLM Board of Regents member (1978-81) **James F. Williams II** has received the Melvil Dewey Medal from OCLC/Forest Press "for creative professional achievement in library management, training, cataloging and classification, and the tools and techniques of librarianship." Williams, currently dean of libraries at the University of Colorado at Boulder, also is a member of the Advisory Committee for PubMed Central, an online archive of life science journals is managed by NLM's National Center for Biotechnology Information.



Dr. Winifred Sewell

Winifred "Win" Sewell, 85, a retired librarian who had worked for the National Library of Medicine during the pioneering computer days of the 1960s, died of congestive heart failure Oct. 23rd at her home in Maryland. A native of Newport, Washington, she went to Washington, DC in the early 1960s, taking a position at NLM shortly thereafter. After her NLM service, she became a consultant at the University of Maryland until 1992. Sewell held a degree in English from Washington State University and received her master's in library science from Columbia University. She also received an honorary doctorate from the Philadelphia College of Pharmacy and was honorary president of the American Association of Colleges of Pharmacy. While at NLM, working with very limited technology, she did groundbreaking work by developing the Medical Subject Headings (MeSH) system for MEDLARS (MEDical Literature Analysis and Retrieval System), NLM's early network of computerized databases and databanks. MeSH remains a key component of NLM's family of databases today.



The following references cite works that discuss the products and services of the NLM. If you know of other appropriate citations for this column, please send reprints or references to Melanie Modlin, Editor, NLM NEWSLINE, Office of Communications and Public Liaison, NLM, Bethesda, MD 20894, or e-mail to: mm354i@nih.gov. (NOTE: Some of the articles listed may be outside the scope of the NLM collection and therefore not available from the Library on interlibrary loan.)

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Thanks to Jacque-Lynne Schulman, Technical Information Specialist, Medical Subject Headings, and Karen Patrias, Senior Resource Specialist, Public Services Division, for invaluable help in compiling this list.



NLM NEWSLINE

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July-December, 2002
Vol. 57, Nos. 3 & 4
ISSN 1094-5970
(Online version—ISSN 1094-6004)

The Secretary of Health and Human Services has determined that the publication of this bi-monthly periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of Management and Budget through June 30, 2003.

 The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984, effective with Vol. 43, No. 6-7.

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