

DEPARTMENT OF HEALTH AND HUMAN SERVICES
NATIONAL INSTITUTES OF HEALTH
NATIONAL LIBRARY OF MEDICINE

MINUTES OF THE
BOARD OF REGENTS
January 27-28, 1998

The 117th. meeting of the Board of Regents was convened on January 27, 1998, at 9:05 a.m., in the NLM Board Room, Building 38, National Institutes of Health (NIH), Bethesda, Maryland. The meeting was open to the public from 9:05 a.m. to 3:30 p.m., followed by the closed session for consideration of grant applications until 4:00 p.m. On January 28 the meeting was reconvened and open to the public from 9 a.m. until adjournment at 12:30 p.m. Dr. Michael DeBakey presided as Chair.

MEMBERS PRESENT

Dr. Michael DeBakey, Chair	Dr. Raymond J. Fonseca
Dr. Tenley E. Albright	Dr. Sherrilynne Fuller
Dr. Marion Ball	Mr. John Gage
Dr. Jordan Baruch	Ms. Michele Klein
Dr. Enriqueta Bond	Dr. George Nolan

EX OFFICIO AND ALTERNATE MEMBERS PRESENT

Ms. Pamela Andre
Ms. Wendy Carter, representing Dr. Kenneth Kizer
Dr. Mary Clutter
Dr. Kathleen McCormick, representing Dr. Jarrett Clinton
Colonel Kristen Raines
General Klaus Schafer
Captain William Wurzel

CONSULTANTS TO THE BOR PRESENT

Dr. Carol Newton, University of California School of Medicine
Dr. Steven Phillips, Iowa Heart Center-Mercy Hospital Medical Center
Dr. Kenneth Walker, Emory University School of Medicine

MEMBERS OF THE PUBLIC PRESENT

Mrs. Mary Lindberg
Mr. Gregory Merrill, H.T. Medical
Mr. Todd Walderman, H.T. Medical
Dr. Bruce Buchanan, University of Pittsburgh
Ms. Lisa White, *The Blue Sheet*

FEDERAL EMPLOYEES PRESENT

Jr. John Eisenberg, Acting Assistant Secretary for Health, DHHS
Dr. Ruth Kirschstein, Deputy Director, NIH
Dr. Donald A.B. Lindberg, Director, NLM
Mr. Kent A. Smith, Deputy Director, NLM
Dr. Michael Ackerman, Assistant Director for HPCC, NLM
Ms. Cassandra Allen, Library Operations, NLM
Ms. Suzanne Aubuchon, Office of the Director, NLM
Mr. Fernando Burbano, Director, Information Systems, OCCS/NLM
Mr. John Butler, Office of Computer and Communications Systems, NLM
Ms. Susan Buyer, Office for Health Information Programs, NLM
Ms. Kimberly Caraballo, Committee Management Assistant, NLM
Ms. Patricia Carson, Office of the Director/NLM
Mr. Peter Clepper, Office of Extramural Programs/NLM
Mrs. Lois Ann Colaianni, Associate Director for Library Operations, NLM
Dr. Milton Corn, Acting Associate Director for Extramural Programs, NLM
Dr. Zuoming Deng, NCBI
Ms. Martha Fishel, Public Services Division, LO/NLM
Dr. Donald Fredrickson, NLM Scholar-in-Residence
Ms. Kathleen Gardner, Office of Inquiries and Publications Management, NLM
Mr. Earl Henderson, Deputy Director, LHCBC/NLM
Mr. Carl Hotton, NCBI
Mrs. Frances Howard, Office of Extramural Programs, NLM
Ms. Betsy Humphreys, Assistant Director for Health Services Research Information, NLM
Ms. Bonnie Kaps, Committee Management Specialist, NLM
Dr. Lawrence Kingsland III, Assistant Director for Applied Informatics, NLM
Ms. Eve Marie Lacroix, Technical Services Division, LO/NLM
Dr. David Lipman, Director, NCBI/NLM
Dr. Alexa McCray, Director, LHCBC/NLM
Mr. Robert Mehnert, Chief, Office of Inquiries and Publications Management, NLM
Mr. Dwight Mowery, Grants Management Office, OEP/NLM
Mr. David Nash, Office of Equal Opportunity, NLM
Dr. Sharee Pepper, Scientific Review Administrator, OEP/NLM
Mr. Donald Popcke, Executive Officer, NLM
Dr. Anna Panchenko, NCBI
Ms. Julia Royall, Office for Health Information Programs, NLM
Ms. Alberta Sandel, Office of the Director, NLM
Mr. John Seachrist, Office of Extramural Programs NLM
Dr. Elliot Siegel, Associate Director, Health Information Programs Development, NLM
Dr. Mel Spann, Associate Director for Specialized Information Services, NLM
Dr. Yuri Wolf, NCBI
Dr. Fred Wood, Office for Health Information Programs, NLM

OPENING REMARKS

Board Chairman Dr. Michael E. DeBakey welcomed the Regents and guests to the 117th meeting of the Board of Regents of the National Library of Medicine. He noted especially the presence of Dr. John Eisenberg, Director of the Agency for Health Care Policy and Research and Acting Assistant Secretary for Health. Dr. DeBakey also welcomed new Regent Dr. Jordan Baruch, President of Baruch Associates in Washington, D.C., to his first meeting. He welcomed two past chairmen who were in attendance—Dr. Steven Phillips and Dr. Kenneth Walker. He expressed his appreciation on behalf of all the Regents to Drs. Richard Rowberg and James Billington of the Library of Congress for hosting tonight's visit and dinner. He called the attention of the Regents to a draft resolution honoring the Medical Library Association on the occasion of its centennial; it will be acted on later in the meeting. Dr. DeBakey also said a few words about a new "telemedicine health channel," sponsored by the Baylor College of Medicine, that is beginning to provide continuing medical education programming for various medical disciplines.

II. REMARKS BY THE ACTING ASSISTANT SECRETARY FOR HEALTH

Dr. John Eisenberg, in his role as Director of the Agency for Health Care Policy and Research (AHCPR), described the Agency and its mission. AHCPR was established by the Congress in 1989 as a successor agency to the National Center for Health Services Research with the goal of investigating the cost and utilization of health care services and quality factors affecting them, and to issue guidelines for more effective and efficient health care delivery. In 1994, the Congress told the Agency to stop issuing guidelines and its budget was reduced over the next several years. Dr. Eisenberg is hopeful that the agency will fare well when the 1999 budget is announced in the next several weeks. The movement toward medicine that is responsive to the marketplace is reflected in the programs of AHCPR, which seek to provide a scientific basis to inform the clinical and organizational planning decisions being made—"the science of health care." There are three levels of decisions that the Agency hopes to influence: public and private sector policy makers; organizational systems (information technology is included here); and clinical decision-making. A major part of the Agency's mission is to set a research agenda in quality—we need to invest more in both the measures of quality and in understanding how we can use those measures to improve the quality of care. AHCPR views health research as a continuum between basic biomedical research and health care delivery research. Dr. Eisenberg briefly described a reorganization of the Agency's structure. He noted that medical informatics was being woven into all areas of the Agency's operation; he is hopeful that the budget will allow for more informatics activity, especially collaborative programs with NLM. There are seven active grants in the area of computerized decision support systems, including several in telemedicine and electronic medical records. Dr. Eisenberg chairs the HHS Data Council that is looking at the integration of the Department's data, survey, and informatics activities.

Following Dr. Eisenberg's presentation, Dr. Steven Phillips applauded the concept of a "continuum" of scientific research. Dr. Enriqueta Bond asked about the level of support for the informatics-related grant activity. Dr. Eisenberg said that previous commitments that had to be carried forward meant that only \$7.5 million was available for new projects. It was his decision that there would be no new program-initiated projects (RFAs) within the agency; AHCPR would respond as best it could to those

it applications it receives. He believes that some of those applications will be for projects related to informatics. Dr. Jordan Baruch commented that it is very difficult to assess the impact of information technology; his experience with the National Academy of Sciences in studying productivity in the private sector revealed that information technology doesn't just affect how we do what we do, but it changes our thinking of what we can do.

III. REPORT FROM THE NIH DEPUTY DIRECTOR

Dr. Ruth Kirschstein said there has been an enormous revitalization of NIH in the last 4-5 years. A number of high caliber new institute directors have been recruited. Outstanding scientists in their own right, they are encouraged by Dr. Varmus to maintain their research credibility through continued laboratory work. She said there is clear recognition of the need for information technology and that a new CIO—Chief Information Officer—will join NIH soon. She noted that the informatics work of NLM's National Center for Biotechnology Information has important implications for many NIH institutes. The spirit of NIH revitalization extends to the Congress and the Administration, she said. They are enthusiastic in their support of NIH activities (and budgets). Following her presentation, Dr. Kirschstein responded to a question from Dr. Fuller by noting that every NIH institute has begun to realize the importance of informatics; those that have large clinical trials and large clinical databases are out in front of the others. The NCI is sponsoring a workshop on clinical trials databases early in February; many of the institutes will be represented at the meeting.

CONSIDERATION OF MINUTES OF PREVIOUS MEETING

The Regents approved without change the minutes of the September 23-24, 1997, meeting.

V. FUTURE MEETING DATES

The Board of Regents will meet next on May 12-13, 1998. Next fall's meeting will be September 24-25, 1998 (a change from the tentative date set at last fall's meeting). The proposed date of January 26-27, 1999, was accepted for the meeting next winter.

VI. REPORT FROM THE NLM DIRECTOR

Dr. Lindberg reported briefly on the 1998 budget for the Library, which is \$161 million—an increase of 7.2 percent from the previous year. The 1999 budget is yet to be announced by the President, but we are optimistic of a substantial increase. Increases are primarily in the area of High Performance Computing and Communications, which is compatible with Dr. Kirschstein's comments about the increasing importance of informatics. In the area of staff changes, Dr. Lindberg noted that Karen Wallingford, Thelma Charen, Edward Syed, and Dr. Donald Buckner have retired from NLM. Recently arrived at NLM is Julia Royall, who is a Special Expert in the Office of Health Information Programs Development. Dr. Milton Corn of the Extramural Programs noted that Dr. Roger Dahlen had retired and he introduced two new staff members: Mr. John Seachrist, Jr., and Dr. Sharee Pepper. Dr. David an introduced several new NCBI staff members: Dr. Carol Hotton, Dr. Anna Panchenko, Dr. Yuri

Wolf, and Dr. Zuoming Deng. In the area of legislation, Dr. Lindberg reported that he, Dr. Lipman, and several other NIH senior officials, including the NIH director, testified last fall at NIH reauthorization hearings. Another bill of interest to the Regents is the Medical Records Privacy Act, introduced in November by Senators Leahy and Kennedy. This bill is an improvement over some previously introduced. Ms. Betsy Humphreys commented that HHS will publish proposed rules concerning standards for security of electronic health data and administrative health data transactions in the *Federal Register* within a month or so. Dr. Lindberg told the Board about an evaluation of Internet connectivity begun by NLM's Dr. Fred Wood. British colleagues have said that daily Internet performance is fine "until America wakes up." NLM's study seems to show that this is not true: performance deteriorates "when England wakes up." This appears also to be the case for other countries and various regions of the United States where Internet connectivity is heavily affected by peak loading during the local business day. The G7 Global Healthcare Applications Project has approved an NLM-suggested study of this problem. Also, NLM is testing various domestic Internet connections, including the links between NLM and the Regional Medical Libraries. The NLM Director drew the Board's attention to the recent statement on intellectual property protection for databases by the American Association for the Advancement of Science, included in the agenda book. The statement is an excellent articulation of the dangers of offering *sui generis* protection to scientific databases independent of current copyright law. American scientific and library organizations are opposed to these aspects of the proposals, which are being made by the World Intellectual Property Organization. The Board has heard about this issue at two previous meetings. Dr. Lindberg spoke briefly about the interagency Next Generation Internet Initiative. That program seeks to build on the success of the existing Internet and to expand its capabilities greatly. The Congress has approved a budget of \$85 million for the NGI; NLM will receive \$5 million of this total for medical applications. It is important that medicine be involved in specifying its needs for applications right at the beginning of the NGI effort. Dr. Lindberg noted that Dr. Sherrilynne Fuller is on the NGI advisory committee. They have been strong advocates for medical involvement with the NGI at the committee's meetings. At this point, the Board of Regents proposed and passed a resolution supporting the Library in its efforts to participate fully in the Next Generation Internet Initiative. Another item briefly reported by the NLM Director is the dramatic increase in online searching since the introduction of free MEDLINE via the Web. Some 300,000 searches are being done each day—more than 10 times the previous rate. Also, NLM has done its first Cooperative Research and Development Agreement (CRADA). This is an agreement with Kathpal Technologies, Inc., to improve and market the Workstation for Interlibrary Loan (WILL) originally developed at NLM. Finally, Dr. Lindberg noted briefly a report issued in September 1997 by the Conference on Fair Use. Excerpts of the report, which deals with copyright in "the digital context," were provided to the Regents in their agenda book.

VII. LONG RANGE PLAN ON NLM INTERNATIONAL PROGRAMS

Dr. Donald Fredrickson, chair of the NLM Long Range Planning Panel on International Programs, said that in his international travels he has found that medical students around the globe know about the National Library of Medicine and that they are "ready" for electronic access to the kinds of services that NLM provides. The "expansionist-minded" Long Range Panel that recently conducted a comprehensive review of the Library's international activities has formulated a "grand plan" for such

services. The plan now placed before the Regents lays out the recommended choices for NLM to sustain its influence in collecting and disseminating medical knowledge around the world. He introduced Ms. Susan Buyer, Acting Chief, Office of Planning and Analysis of the NLM Office of Health Information Programs Development, and Panel Executive Secretary, who described briefly how the NLM's original long range plan was done in 1987, and how it has been periodically augmented by the reports of specially convened panels. The latest, the Planning Panel on International Programs, met three times and the draft report of their deliberations is now before the Regents. Ms. Buyer described the membership of the panel; Dr. Marion Ball was the Board's liaison to the panel. E-mail and the World Wide Web were most helpful in moving along the work of the panel, she said, and she showed the Board the home page and the variety of information available there. After Ms. Buyer's remarks, Dr. Elliot Siegel, NLM Associate Director for Health Information Programs Development, who has responsibility both for NLM's planning activities and international programs, said that the report before the Board is an action document. He welcomes their comments and suggestions and hopes that the Board will ultimately adopt it for incorporation into the overall NLM Long Range Plan. The Board's Planning Subcommittee met yesterday to review the report. Dr. Siegel briefly went through the Panel's seven recommendations, categorized under three objectives. These objectives are to strengthen and expand global access to the world's health-related literature; to chart new routes to biomedical knowledge and its use; and to enable NLM to fulfill its international mission. He briefly described the recommendations under each.

Dr. Steven Phillips, former Board Chair, said that charting the Library's future international involvement is an enormously important undertaking. He praised the NLM leadership, staff, and Dr. Fredrickson for bringing the plan to fruition. He commented on several aspects of the plan, including security issues and the costs involved. Some 30 percent of "free" MEDLINE searching is by non-U.S. users, and there are many advantages to the NLM in receiving and disseminating information internationally. He strongly urged the Board to vote to approve the plan. Dr. Ball, who was the Regents' liaison with the planning panel, agreed with Dr. Phillips and commented that the existing non-U.S. MEDLARS Centers give NLM an advantage in planning the future of its international outreach programs. In fact, much of the advice by the DeBakey Outreach Planning Panel in its report (1989) and in the Education and Training of Health Science Librarians Panel Report (1995) is pertinent to today's discussion on international programs. The Internet and World Wide Web are the gateway to the "new world" of information, and the time is right to take full advantage of them in improving international medical communications. She also urged that the report be accepted. Dr. Kenneth Walker, also a former Board Chair, and who is actively involved in medical information outreach to the newly independent state of Georgia in Eastern Europe, said there is no doubt that international involvement will be an extremely important part of NLM's responsibilities over the next few decades. New forms of information (like the Visible Humans), new modalities of dissemination (like the Web), and training, will all be important to NLM's international programs in the coming years. The panel's report is "a finely nuanced document" and it will serve the Library well as a blueprint for the next several decades. He urged that it be approved. Dr. Jordan Baruch said that NLM should articulate a series of statements that would respond persuasively to inquiries about spending American dollars on international programs. For example, the advantages of enriching the NLM collections with foreign materials should be emphasized. Dr. Lindberg agreed, noting the 53 percent of MEDLINE is of non-U.S. origin.

Dr. Fonseca said that it will be important to identify implementation strategies and outcomes assessments for the excellent goals in the report. A resource needs assessment will also eventually be required for each of the recommendations. Dr. Bond echoed the need for a resource assessment; she believes that NLM will have to justify the need for increased budget to accomplish these goals. A motion was made that the Board of Regents accept the report; it was passed unanimously.

VIII. Nominating Committee

Dr. DeBakey appointed a committee to put forward names for the Regents chair to be elected at the next meeting: Dr. James A. Zimble, Ms. Wendy Carter, and Col. Kristen Raines. Dr. Zimble will chair the committee.

IX. Digital Library Program: Phase II

Dr. Alexa McCray, Director of NLM's Lister Hill National Center for Biomedical Communications, updated the Regents on the broad multi-agency research program known as the Digital Libraries Initiative [URL: <http://dli2.nlm.nih.gov>]. Phase I, which involved six multi-year awards sponsored by NSF, ARPA, and NASA, is now coming to an end. Phase II, now beginning, will involve NLM's participation. Dr. McCray briefly described the work done at the six sites in Phase I (University of Illinois, Berkeley, Stanford, Carnegie Mellon, University of Michigan, and the University of California at Santa Barbara). Last spring, a planning workshop looked at where Phase II of the Initiative should be heading (their report is at <http://www.si.umich.edu/SantaFe>). She listed the four areas of concentration in Phase II and noted several examples in each: human-centered research (information discovery and retrieval methods); content and collections (issues of data capture and preservation); systems-centered (open network architecture, scaling systems, evaluation); and testbeds and applications (tools for formatting, encoding, specific domains like health care). The general program announcement soliciting applications will be issued soon. Proposals will be due in late spring or summer; the first awards will be made before the end of the fiscal year. NLM's participation will be through its Extramural Programs Division. Various NLM datasets will play a prominent role in the research, such as those from the Visible Human Project and the Unified Medical Language System.

Following Dr. McCray's presentation, Dr. Jordan Baruch said he was enthusiastic about the potential of the Digital Libraries Initiative. A digital library is an opportunity to pull together information from various fields—biomedicine, engineering, physics, mathematics—so that individual collaborators in these fields can work on relevant problems that require information from different disciplines. Such a digital compendium can do more to strengthen our ability to deal with health issues than any other “replacement of the Dewey Decimal System.” Dr. Sherrilyne Fuller said that what Dr. Baruch has described is truly a vision of the Integrated Advanced Information Management System (IAIMS), which NLM began some 15 years ago. Today's technology can make that vision happen. Dr. Lindberg commented that the Regents should take the message of this opportunity back to their institutions and encourage the submission of good applications. In addition, he said, Dr. Baruch's comments would seem to argue for the need for NLM to convene a meeting to pull together those disciplines; it otherwise will not happen.

X. RESOLUTION TO RECOGNIZE THE MEDICAL LIBRARY ASSOCIATION

The Board of Regents unanimously passed a resolution honoring the Medical Library Association on the occasion of the MLA's Centennial.

XI. LATEST DEVELOPMENTS AT THE NATIONAL CENTER FOR BIOTECHNOLOGY INFORMATION

Dr. David Lipman, Director of NLM's National Center for Biotechnology Information, demonstrated the new 2.0 version of the web-based PubMed retrieval system released yesterday [www.ncbi.nlm.nih.gov/PubMed]. It incorporates major changes in indexing and query parsing, the work of a number of NLM staff from the Office of Computer and Communications Systems, Bibliographic Services Division, and NCBI. Dr. Lipman typed in the natural language query "how do I treat high blood pressure with diet"; the system responded with 3000 "hits." A new feature is a screen that displays just the how the query was presented to the computer ("treat" was mapped to the subheading "therapy," etc.). The search can be modified from this screen by adding, subtracting, or modifying terms. He showed how PubMed now incorporates the Loansome Doc feature for ordering copies of articles. A browser for the Medical Subject Headings (MeSH) vocabulary is also now available. Using the web, Dr. Lipman showed the Board a preview of what is soon to be released in the Cancer Genome Anatomy Project. This is a National Cancer Institute project to use the expression level of the various genes as a way to "fingerprint" cells that are transitioning from normal to precancerous or cancerous. It will increase our understanding of the cancer mechanism and help to develop diagnostic tools. Newly developed laser microdissection techniques are an integral part of the project. The communications aspects of the project—and its web site—were developed with the help of NCBI scientists. The URL is www.ncbi.nlm.nih.gov/ncicgap/. Dr. Lipman also used the web to demonstrate a joint project with the National Institute of Allergy and Infectious Diseases, Burroughs Wellcome, and others to sequence the genome of the Plasmodium parasite that causes malaria.

Following the presentation, Dr. Carol Newton said that the word that sums up all this work is "integration." She said that the improvements in PubMed that Dr. Lipman demonstrated showed a high level of integration of specialized vocabularies, other linguistic sources, and plain language. Integration is quite evident on the NIH campus, as Dr. Lipman described the close collaboration of scientists from a variety of institutes to confront a common problem. International cooperation is also at the heart of the Human Genome Program. She was impressed with the way graphic displays and maps were being integrated with textual information in the various projects and products demonstrated by Dr. Lipman. Dr. Mary Clutter mentioned that the National Science Foundation received \$40 million from the Congress this year to begin a plant genome project. One of the biggest problems she is having is getting people in industry to cooperate in developing virtual centers or "collaboratories" where people around the world can work on the project in an integrated fashion. Private companies have already started sequencing the data and don't want to share it. Nevertheless, she is optimistic that the work will get done and eventually be accessible by all scientists. Dr. Lipman said that expression analysis is critically important and is an area where the Government can lead in investing in the basic infrastructure.

XII. RELAIS SYSTEM

Eve-Marie Lacroix, Chief of NLM's Public Services Division, reported on the development and installation of "Relais," a new document delivery system at NLM and the NIH Library. The system was installed by Network Support Inc. of Ottawa, Canada. Ms. Lacroix introduced the NLM staff involved—Martha Fishel (Deputy Chief of the Division), Cassandra Allen (Head of the Collection Access Section), and John Butler (of the Office of Computer and Communications Systems). The Library's present DOCLINE system, which is 12 years old, has fueled a steady growth in interlibrary loan traffic to about 3 million transactions annually by 3,000 medical libraries. NLM handles about 11 percent of the total (mostly the more difficult to fill requests). Although internal photocopy processing has become quite efficient, a growing number of requests (about 25 percent) are for fax or Internet delivery. Requests in clinical emergency situations are difficult and labor intensive to accommodate in the present system. With the Relais system, requests are received via DOCLINE and transferred to Relais every 15 minutes. The needed item is pulled from the shelf and then scanned (as opposed to photocopied). The images are sent either to a high-speed printer, directly to the requester via the Internet, or faxed. The new system will reduce processing time by 24 hours or more. Ms. Lacroix showed the Regents a videotape made by the Library staff that showed the "before and after" of the document delivery system.

Following the presentation, Dr. Fuller said that this is a clear demonstration that computer technology can lead to productivity gains. The saving in time and effort to provide copies (or images) of journal articles is obvious. She asked whether this success in reducing the turnaround time for interlibrary loans will result in "everybody" sending their requests to the NLM. Ms. Lacroix said that similar Internet-based software, by other companies, can be applied to handle document delivery at hospitals and other institutions. She hopes that NLM's success will spur other libraries to similar efforts. Michele Klein commented that as hospitals reduce the average length of stay by patients, the need for ever faster document delivery in the patient care setting will increase. She asked if articles could be e-mailed with this system, whether Relais is compatible with the EPIC system her library is looking at, and whether there are copyright implications. Ms. Lacroix said that Relais does have e-mail capability; the NIH Library is now testing it for NLM. As to EPIC, it was suggested that perhaps Ms. Klein's library could become a test site for such compatibility. We believe there are no special copyright considerations, Ms. Lacroix said.

XIII. REPORT OF THE ACTING ASSOCIATE DIRECTOR FOR EXTRAMURAL PROGRAMS

Dr. Corn reported on the increased interest at NIH in grant programs and the proposal to mainstream new investigators to RO1s. New investigators represent the replenishment of the researcher pool and is a reflection as to how well NIH is launching scientists trained to do research. Historically, most new investigators apply for RO1 support, but a significant number apply for R29 (FIRST) awards. There are differences between the two mechanisms, some of which may not actually benefit the new investigator. The most significant aspect may be the dollar limitations of the R29 -- \$350,000 over five years, with no single year exceeding \$100,000. Dr. Corn noted that new investigators are at a disadvantage when competing with seasoned professionals for NIH funds. For this reason, the R29

grant mechanism was reserved for investigators making their first application. While R29 applications enjoy a somewhat better success rate than RO1s from previously unfunded investigators, that advantage is reversed when the investigator applies for a competing renewal of that project. This raised the question of the overall value of the R29 in launching the next generation of scientists as well as whether it is appealing only to scientists in areas where research is less expensive. Dr. Corn reported that the NIH proposes that new investigators follow the RO1 model and that the R29 mechanism be terminated. This would allow the applicants maximum flexibility in identifying levels of support and periods of support that are most appropriate for the work they are planning. There will be no set period of performance, proportion of time required or dollar cap. Letters of support will not be needed since these are not a requirement of the RO1 application.

Dr. Michael DeBakey and other members of the Board commented on the unfortunate perception in the clinical community of the increasing difficulty of getting clinical research awards. The NIH has proposed a five-step plan to address this problem including, among others, improved training opportunities; development of creative skills for first-rate research; and alteration of the review process.

XIV. REPORT FROM THE SUBCOMMITTEE ON OUTREACH AND PUBLIC INFORMATION

Dr. Tenley Albright, Subcommittee chair, reported that the Subcommittee on Outreach and Public Information met yesterday morning and heard reports about outreach activities over the past four months. One of these is the great amount of publicity resulting from last June's announcement about "free MEDLINE" (MEDLINE has been included in the story lines of "ER" and "Chicago Hope," for example). Also, NLM is sponsoring a "train the trainers" program for teaching older Americans to access health information (including MEDLINE) on the web. The Frankenstein exhibition (which the Regents will hear about next) resulted in television and newspaper coverage for the NLM. The Subcommittee discussed the possibility that the next major NLM exhibition ("Asthma: The Breath of Life") could be shown also at other locations. There was also some discussion about the possibility of a "Women in Medicine" exhibition, in conjunction with the 150th anniversary of the first woman graduate of an American medical school. International outreach was discussed by the subcommittee in the context of the malaria initiative in Africa, in which the NLM is involved. Following Dr. Albright's remarks, Dr. Michael DeBakey commented that tremendous strides have been made since the Board's outreach report was issued in 1989, both in number and quality of information services made widely available by NLM and the vigorous program of outreach to let health professionals and the public know about these services. Dr. George Nolan commented that the NLM outreach programs have exposed the Library as a leading center of information technology, an institution that stays on the cutting edge of the problems we will be facing in the future. Dr. Steven Phillips, former Board chairman, said that he was a Regent before the outreach program began. He attributed much of the success of the program to the quality of Dr. Albright's current leadership of the outreach subcommittee. Dr. Marian Ball noted that the Friends of the NLM have also played an important role in NLM's outreach efforts. Dr. Albright showed a brief video clip showing a network promo for and the actual "ER" MEDLINE episode. She also read a letter to the Board from Dr. Lois DeBakey, former Regent, who has been much involved in NLM's outreach program over the years but who was unable to attend

this meeting. Dr. DeBakey, who made the original contacts with the “ER” and “Chicago Hope” programs, said that NLM’s decision to open up its database free to web users is having a tremendous beneficial impact. She urged that the Regents continue to educate their colleagues and the public about the Library’s services.

XV. FRANKENSTEIN: PENETRATING THE SECRETS OF NATURE

Dr. Elizabeth Fee, Chief of the History of Medicine Division, described the various themes of the major NLM exhibition: *Frankenstein: Penetrating the Secrets of Nature*. The exhibit opened to the public on October 31, 1997. Using exhibit information on the NLM website [www.nlm.nih.gov/hmd/frankenstein/frankhome.html] as a visual resource, Dr. Fee talked about Mary Shelley, her education and upbringing, and how she came to write her book and the scientific environment of her time. How her creature has been portrayed since 1818 reflects the scientific milieu of contemporary society: from resuscitation of the dead, grave-robbing for dissection, and monstrous births down to today’s cloning and organ transplantation. Dr. Fee concluded her presentation by taking the Regents on a tour of the exhibition in the NLM lobby and rotunda area.

When the Regents reassembled, Dr. Michael DeBakey congratulated that staff on the quality of the exhibition; he believes that it is much too important to restrict the information to those who can visit the NLM. He said that a catalog or other publication based on the exhibition would greatly extend its usefulness. Dr. Baruch said that a folio-sized publication would enable it to be shown at high schools, for example. The Board then voted unanimously to go on record urging such a publication. Dr. DeBakey said that the NLM might also investigate the possibility of sending its exhibits to science museums and other venues for exhibitions, thus also greatly extending the reach of the information they contain. Dr. Zimble suggested that the exhibit might “migrate” to the Armed Forces Institute of Pathology, where it could be shown in the museum there.

XVI. REPORT: VISIBLE HUMAN PROJECT

Dr. Michael J. Ackerman, Assistant NLM Director for High Performance Computing and Communications, reported that there is much information about NLM’s Visible Human Project on the Library’s web site (www.nlm.nih.gov), including links to some of the many applications designers around the world. There are almost 1,000 licensees of the Visible Human datasets. The Visible Humans are also featured in science exhibits at museums in Baltimore, Toronto, and San Jose. The project is also mentioned the novel “*The Horse Whisperer*.” There are mirror sites in Scotland, Brazil, Italy, Singapore and, soon, Japan so that the data is easier to download. A conference was held at NIH in October 1996 where 50 people who are using the Visible Human dataset made presentations (video proceedings are on the NLM web site); a second such conference will be held October 1-2, 1998. Dr. Ackerman introduced Mr. Gregory Merrill, President of HT Medical, Inc. That company, one of the early users of the Visible Human dataset (they were one of the presenters at the 1986 conference), is working in virtual reality in medicine.

Mr. Merrill said that the earlier Frankenstein discussion is germane because his company is trying to “bring the Visible Human back to life.” Working in virtual reality and simulation has great potential because current training methods of training in procedural medicine are very limited. Among the drawbacks of current practices: patients are (too often) the object of training, with obvious attendant dangers; cadavers are not “normal” and thus limited in usefulness; animals have obvious limitations as surrogates for human anatomy; and plastic models can get sophisticated, but lack the dynamic properties of living tissue. There are three basic components to a simulation system: a computer, a device that simulates the interface the health care provider has with the patient, and the software that ties the system together. Mr. Merrill talked briefly about each of the components. The computers, of course, have gotten smaller, faster, and less expensive (from \$250,000 several years ago, to a board of several hundred dollars today). Simulation has been used in teaching IV’s and needle-stick procedures. The Visible Human datasets especially come into play in software development. Mr. Merrill showed a videotape, produced last fall by the Discovery Channel, that illustrates how HT Medical uses the Visible Human datasets for surgical simulation. He also showed a brief “home” videotape describing several other current HT Medical research-based simulation projects for medical training. Dr. DeBakey then actually manipulated a virtual bronchoscopy system—using a normal flexible bronchoscope and the head and chest of a dummy based on Visible Human data. The Regents were able to see projected on a large screen the progress of the scope through the virtual airways. Dr. DeBakey described what he was “seeing” in the lungs and, when he was finished, said that what we were seeing was, in fact, very “real.” Mr. Merrill said that we were looking at a normal patient; the next step is to build in various abnormalities and pathologies.

XVII. BOARD OF SCIENTIFIC COUNSELORS

Dr. Bruce Buchanan of the University of Pittsburgh, Chair of the Lister Hill Center Board of Scientific Counselors (BoSC), reported to the Regents on the results of their intensive October 1997 review of the Visible Human Project. The BoSC is very much aware of the spectrum between exploratory and developmental work. It sees as its function not only reviewing work already performed but to recommend scientifically promising directions for these projects. The BoSC concluded that the project was appropriate for a Federal research agency in that, when it began 10 years ago, it was highly exploratory, uncertain, and high-cost. The Counselors believe that they can contribute to the project by indicating possible future directions. The BoSC was impressed with the care in planning and monitoring of the project’s progress. Technology transfer into the private sector of the Visible Human data is working well, which reinforces the foresight of its initial planners. The Board believes that the next wave of research should progress along three dimensions: (1) scale and resolution (for example, zooming in and out across diverse levels—even molecular); (2) structural changes over time (for example, overlay the normal aging process on Visible Human data); and (3) the introduction of the morphologic variations seen across all of humanity. The Counselors considered the possibility of “doing more of the same” with additional people—infants, elderly, etc. This route was rejected as not scientifically challenging enough for an organization like the Lister Hill Center. The challenges come from pressing on with the data set in many different ways rather than introducing additional static data sets. Other possible directions: developing better user tools and overlaying physiologic function on the static data set.

Following Dr. Buchanan's presentation, Dr. Zimble asked how you can "zoom in" on other levels when the resolution to do so doesn't exist in the data set. Dr. Buchanan answered that you could envision generating images, for instance moving within a protein. There exists enough knowledge of protein structure to allow superimposing another data set on the Visible Human. Dr. Fuller commented that one remarkable aspect of the project is that beyond the data set itself, the Visible Humans have spawned a new academic discipline called "structural informatics."

XVIII. "THIS IS YOUR LIFE" VIDEO

The Regents viewed a video made by the American College of Medical Informatics in honor of Dr. Lindberg. The NLM Director was presented the 1997 Morris F. Collen, M.D. medal at the College's Fall Symposium.

CLOSED PORTION OF THE MEETING -January 27, 1998. 3:30 - 4:00 p.m.

This portion of the meeting was closed to the public in accordance with the determination that it was concerned with matters except from mandatory disclosure under Sections 552b(c)(4) and 552(c)(6), Title 5, U.S. Code and Section 10(d) of the Federal Advisory Committee Act, as amended (5 U.S. C. Appendix 2).

There was a discussion of procedures and policies regarding voting and confidentiality of application materials, committee discussions and recommendations. Members absented themselves from the meeting during discussion of and voting on applications from their own institutions, or other applications in which there was a potential conflict of interest, real or apparent. Members were asked to sign a statement to this effect.

Grant Review

The Council reviewed 74 applications requesting \$32,461,985 and recommended 49 applications with a total cost of \$22,651,411.

XIX. ADJOURNMENT

The meeting was adjourned at 12:25 p.m.