

The NIH Record

Scientists Report Gains in Understanding Alzheimer's

By Bobbi Bennett

Encouraging progress is being made by intramural scientists in understanding the clinical course and genetics of Alzheimer's disease (AD) and in designing strategies for treating it. This research was described to reporters at a recent NIH Science Writers Seminar by Dr. Stanley Rapoport, chief of NIA's Laboratory of Neurosciences; Linda E. Nee, social science analyst in the clinical neuropharmacology section, NINDS; and the seminar's moderator Dr. Trey Sunderland, chief of the unit on geriatric psychopharmacology of NIMH's Laboratory of Clinical Science.

Two to 4 million Americans are now believed to suffer from AD, and experts predict that number will increase to 14 million by the middle of the next century. The dementia of this cruel disease involves memory loss, disorientation, impairment of learned skilled movements and loss of language and object-recognition abilities.

The only definitive way to diagnose AD is when an autopsy reveals large amounts of the disease's hallmarks, neuritic plaques and neurofibrillary tangles, in brain tissue. The tangles are dense networks of nerve cell fibers to which phosphate molecules have been added (phosphorylated) abnormally. The plaques are degenerating nerve cell terminals that have cores of beta-amyloid, a protein not normally found in the brain.

The plaques and tangles are not equally dis-



These identical twins had autopsy-confirmed Alzheimer's disease. Twin A (l) developed the disease 2 years before her sister did, even though her sister had a history of head trauma, often thought to be a precipitating factor in AD. Identical twins were found to both develop AD only 40 percent of the time, which indicates that environmental factors probably play a role in AD.

tributed in the AD brain. "AD is a well-behaved disease; it doesn't march indiscriminately through the brain," stated Rapoport. Rather, AD affects the association areas of the brain that process sensory inputs and are involved in higher cognitive functions such as speech, language, and elaborate planning. These regions are larger in the human

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Ruffin Named Associate Director for Minority Programs

Dr. John Ruffin has been named to the newly established position of NIH associate director for minority programs. The appointment is effective Aug. 26.

Ruffin was dean of the college of arts and sciences and a professor of biology at North Carolina Central University, Durham.

In his new position, Ruffin will have overall responsibility for development and coordination of NIH activities to strengthen minority research and training programs, improve the effectiveness of all programs aimed at increasing minority participation in biomedical research, foster research related specifically to minority health issues, enhance the research capabilities of predominantly minority institutions and ensure effective participation of the extramural and intramural scientific communities in these matters.

HHS secretary Dr. Louis W. Sullivan has taken a special interest in minority health issues. He said, "The recently released 14th annual study on the health status of the nation showed progress has been made, but not equally. The shocking disparity between white

and black health must be addressed. Closing the gap will not be easy, but this department and this administration are committed to improving this situation."

Ruffin earned his Ph.D. in 1971 at Kansas State University, Manhattan. He won an NIH postdoctoral fellowship and a National Science Foundation postdoctoral fellowship, as well as a Cabot research fellowship from Harvard University. He was appointed to the North Carolina governor's advisory board on science and technology, and is a member of 11 professional societies.

At North Carolina Central University, his activities included coordinating the health careers academic advancement program and the 16-member institution health sciences consortium. He was a member of the premedical and allied health careers advisory committee, biomedical science research committee, animal welfare committee, university human subjects in research committee, academic planning committee and university executive council.

Ruffin and his wife Angela have three children. □

Fortieth Features

Mimicking Mother Nature

By Frances Taylor

First in a series to commemorate the 40th anniversary of the NINDS

It's not nice to fool Mother Nature, warned the old TV ad. But scientists in the Neural Prosthesis Program couldn't agree less. Using tiny receivers and slender wires, they are creating artificial connections with the body's nerves.

"We're trying to give back function that has been taken away by neurological damage," explains Dr. William Heetderks, medical officer for the program, which is part of the National Institute of Neurological Disorders and Stroke. Under the 20-year-old initiative—which now includes more than 30 grants and contracts—scientists nationwide are devising neural prostheses with support from both NINDS and the National Institute on Deafness and Other Communication Disorders.

These scientists hope to implant the prostheses in people disabled by nerve damage. The devices are designed to restore lost abilities—such as hand movement in the paralyzed—by providing substitute signals for natural nerve messages.

In fact, neural prostheses are already at work. In pacemaker users, they time the

(See **NINDS**, Page 8)

Research Festival Agenda Set

The final agenda for the NIH Research Festival 1990, scheduled to take place on the NIH campus Monday, Sept. 10 and Tuesday, Sept. 11, has been announced. The purpose is for intramural scientists from all of NIH to exchange ideas and discover areas of mutual scientific interest. It will be filled with symposia, workshops, and poster sessions focusing on emerging fields and on topics under active investigation in more than one institute.

On Monday at 9 a.m. in Masur Auditorium, the first annual NIH Alumni Symposium will be held. The symposium will honor Drs. Emil Frei and Emil Freireich for their pioneering work on leukemia. At 3:30 p.m. the intramural component of Research Festival 1990 will be launched with a symposium on "AIDS" to be held in Masur Auditorium. The symposium will be followed by a beverage and cheese poster session in the NIH Research Festival tent located in parking lot 10-D, southwest of Bldg. 10.

On Tuesday, 17 workshops will be held from 8:30 to 11 a.m. and 18 workshops from 12:30 to 3 p.m. in various conference rooms throughout NIH. Lunch will be available in the Research Festival tent from concession

(See **FESTIVAL**, Page 2)

FESTIVAL

(Continued from Page 1)

stands for a nominal charge. Another poster session will be held from 10 a.m. to 1 p.m. in the tent. Three other symposia will be held from 3:30 to 5:30 p.m. After the symposia, a free picnic will be held with music by the Street Life Band. Registration is not required for any of the Research Festival events, except the picnic dinner. Free tickets may be picked up at R&W stores.

A more detailed program will soon be distributed and available at the Visitor Information Center in Bldg. 10.

Festival Symposia Schedule

Monday, Sept. 10, 9 a.m.-12 noon
Masur Auditorium, Bldg. 10

A. Alumni Symposium — Leukemia, 25 Years Later

Chairman: Bruce Chabner, NCI

Introduction: *Clinical Research at NIH in the Frei-Freireich Era.*

Vincent DeVita, Memorial Sloan-Kettering
Growth Regulation of Leukemia
James Griffin, Dana-Farber Cancer Institute
Differentiation Therapy of Human Leukemia
Paul Marks, Memorial Sloan-Kettering
Bone Marrow Transplantation
Donnall Thomas, Fred Hutchinson Cancer Center

Prospects for Cure of Acute Myelocytic Leukemia
Emil Freireich, M.D. Anderson Cancer Center
The Next 25 Years in Cancer Treatment
Emil Frei, Dana-Farber Cancer Institute

Closing Remarks and Award Presentation
Samuel Broder, NCI

Monday, Sept. 10, 3:30-5:30 p.m.
Masur Auditorium, Bldg. 10

B. AIDS

Chairman: Anthony S. Fauci, NIAID

Opening Remarks

J. Edward Rall, OD

The Epidemiology of HIV Infection: Past Experiences and a Look to the 1990's

William Blattner, NCI

Gene Regulation of HIV

Malcolm Martin, NIAID

Immunopathogenic Mechanisms of HIV Infection

Anthony S. Fauci, NIAID

Recent Advances in the Study of Kaposi's Sarcoma

Robert Gallo, NCI

Therapeutic Interventions in HIV Infection

Samuel Broder, NCI

Tuesday, Sept. 11, 3:30-5:30 p.m.
Masur Auditorium, Bldg. 10

A. Frontiers in Neurobiological Research

Chairman: Daniel L. Alkon, NINDS

Cellular Mechanisms of Neuronal Change

D. Alkon, NINDS

The NK Homeobox Gene Cluster

M. Nirenberg, NHLBI

Shaping of Cortical Connections During Development

B. Stanfield, NIMH

Neuronal Substrates of Memory Storage

J. Olds, NINDS

Neuropeptide Regulation of Neuronal Survival

D. Brenneman, NICHD

Tuesday, Sept. 11, 3:30-5:30 p.m.
Wilson Hall, Bldg. 1

B. Gene Transfer and the Potential for Genetic Therapy

Chairman: Arthur W. Nienhuis, NHLBI

Gene Transfer into Hematopoietic Stem Cells

A.W. Nienhuis, NHLBI

Endothelial Cells as Targets for Gene Insertion

D. Dichek, NHLBI

Gene Therapy for ADA Deficiency

R.M. Blaese, NCI

Gene Therapy in the Treatment of Cancer

S.A. Rosenberg, NCI

Present and Future Use of Gene Therapy

W.F. Anderson, NHLBI

Tuesday, Sept. 11, 3:30-5:30 p.m.
Lipsett Amphitheater, Bldg. 10

C. Cell Adhesion Molecules: Role in Development and Immunity

Chairman: Ethan M. Shevach, NIAID

Role of Extracellular Membrane Proteins and Their Receptors in Development

Kenneth Yamada, NCI

Biological Activities of Basement Membrane

Hynda Kleinman, NIDR

Diversity of T Lymphocyte Adhesion Molecules

Stephen Shaw, NCI

Integrins, gamma delta T cells, and Autoreactivity

Ethan Shevach, NIAID

Image Update Workshop

An "Image Update Workshop" for men and women will be held in Conf. Rm. 7, Bldg. 31, on Thursday, Aug. 23 from noon until 1 p.m. Participants will learn concepts to help define personal style and project a more confident, dynamic image. The workshop will be conducted by Betsy O'Connell of Positive Impressions Ltd. All NIH'ers and families are welcome to attend this free seminar. □



Caroline Percopo of NEI's immunology and virology section, Laboratory of Immunology, is one of five recipients of the 1990 Raymond W. Sarber Fellowship Award, granted to students for their exceptional research. Percopo's research was performed as part of her master's thesis at Catholic University. Her award-winning abstract, "Immunomodulation of a Unique Retinal Resident Cell by Interferon-gamma and Anti-*Ia* Antibody," was accepted for presentation at the annual meeting of the American Society for Microbiology in Anaheim, where she was honored for her accomplishments.

The NIH Record

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NIA Establishes New Unit in Hawaii To Study Dementia and Aging

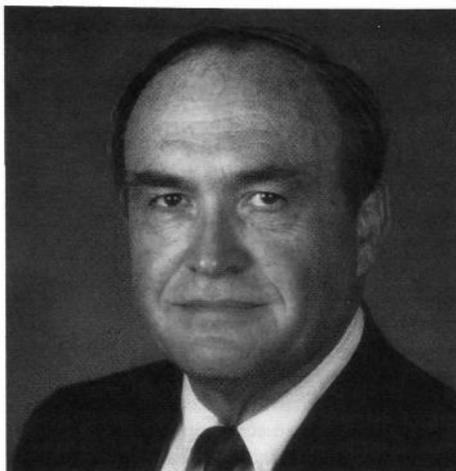
By Michael R. Fain

The National Institute on Aging, through its Epidemiology, Demography, and Biometry Program (EDB), will establish an Asia-Pacific office in Honolulu to coordinate its epidemiologic research activities in Hawaii, the Pacific, and Asia. Dr. Lon White, chief of EDB's epidemiology office, has been appointed chief of the Asia-Pacific office.

In Hawaii, White will direct the Honolulu Asia aging study (HAAS), an investigation of dementia and aging being conducted in cooperation with the National Heart, Lung, and Blood Institute. These studies are important because researchers have observed that rates of Alzheimer's disease seem to be substantially lower in Japan (and possibly also in China) than in the United States and Europe while rates of vascular dementia are similar or higher in Asia. The research is being conducted to determine if these apparent differences are due to methodologic factors, to genetic differences, or to environmental factors.

According to White, "The central purpose of the NIA effort will be to define the rates of Alzheimer's disease and multi-infarct dementia and to identify risk factors associated with the development and progression of both diseases."

The HAAS will be coordinated with parallel studies being developed at three sites in Japan (Hiroshima, Tokyo, and Osaka), one in Tai-



Dr. Lon White

wan, and one in Seattle. The National Center for Nursing Research and the Department of Veterans Affairs will be involved in this research effort and are expected to supplement the cooperative NIA/NHLBI effort with resources and researchers.

The Hawaii component of the study would not have been possible without a unique resource developed by the NHLBI during the past 25 years. The Honolulu Heart Program is a prospective study of cardiovascular diseases

in American men of Japanese ancestry born from 1900 to 1919 and living on the island of Oahu in 1965. Early next year, approximately 5,000 of these men between 70 and 90 years of age will be reexamined to determine their overall health and well being and to identify any cardiovascular or pulmonary abnormalities.

In this phase of the study, the NHLBI will measure manifestations of cardiovascular and pulmonary disease while the NIA, NCNR, and VA studies will focus on aging, with the emphasis on Alzheimer's disease and multi-infarct dementia. Wives of a subgroup of the participants will be examined as part of a special followup. Since two-thirds of the study participants are veterans, the Honolulu Veterans Administration will contribute a neurologist to assist in diagnostic and clinical research activities.

White came to NIA as a research associate in the National Institute of Child Health and Human Development in 1964. After completing a pediatric residency in 1969 at the University of Washington Affiliated Hospitals in Seattle, he was appointed a research scientist in the Epidemiology Branch of NINCDS. In 1974, he became a research scientist in the Laboratory of Central Nervous System Studies, NINCDS. White joined the EDB program at NIA in 1980 and became chief of the epidemiology office in 1983. □



Dr. Marion Zatz has been appointed chief of the cellular basis of disease section of the NIGMS Cellular and Molecular Basis of Disease Program. She has been a program administrator in the section since 1984. Zatz, a native of New York, earned her Ph.D. in microbiology from Cornell University. Before coming to NIH, she was an associate professor in the biochemistry department at George Washington University Medical School.

Children's Inn Use Takes Off

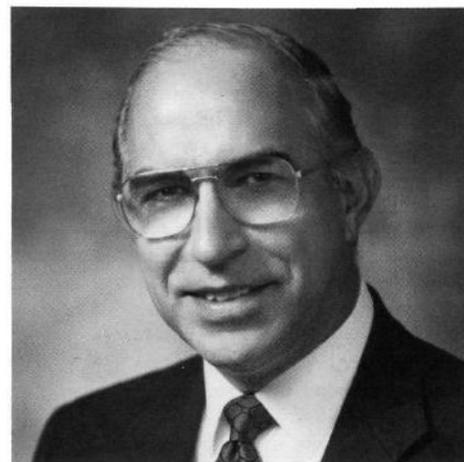
The institutes wasted no time utilizing the Children's Inn at NIH once it opened on July 2. In its first month of operation, the inn hosted 103 patients from nine institutes and 31 states. Most patients hailed from Florida, New York and Pennsylvania. Patients and family members spent a combined 439 nights in the inn. NCI was the overwhelming leader as sponsor of reservations.

"Actually, the first week was really slow," said Andrew G. Tartler, executive director of the inn. "After that it was just bananas."

Another significant statistic was released by Pam Keller, director of inn volunteers: some 1,148 hours were logged by volunteers during the inn's inaugural month. □

Coed Flag Football Organizes

Male and female players of all experience levels are needed for a flag football league this fall. Games emphasize fun, not discomfort. For more information call Sharon, 652-6948 evenings or 530-3866 during the day. □



Dr. George J. Galasso recently was voted president-elect of the International Antiviral Research Society at its annual meeting in Brussels. This recognizes his longstanding involvement in antiviral research. Galasso initiated the Antiviral Substances Program for NIAID in 1969, and was instrumental in the early support for interferon and the clinical evaluation of vidarabine—the first antiviral approved for use against herpes encephalitis, a serious viral disease.

ALZHEIMER'S

(Continued from Page 1)

brain than in that of any other mammal. AD's preference for this region has led Rapoport to theorize that the disease may have been introduced during the evolution of primates to man and may explain why there is not—and may never be—an animal model for AD.

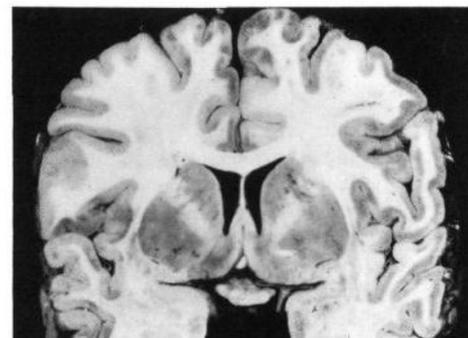
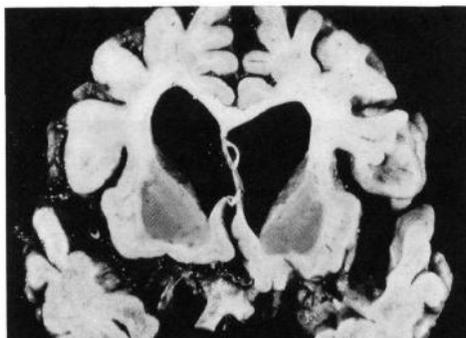
Brain Imaging

To study the course of AD, Rapoport and his colleagues have been using PET, an *in vivo* imaging technique that can be used to measure the energy demand—and therefore metabolic activity—in regions of the human brain. They have found that, as the disease progresses, the metabolic rates decrease in the association areas. There also are differences between the corresponding association areas in the right and left hemispheres of the brain that are not seen in normal individuals. On the basis of these asymmetries, they have been able to predict, 1 to 3 years in advance, what type of deficit—language or visuospatial—patients with early AD will develop. For example, in right-handed patients, lower metabolic activity on the left side of the brain indicates their major problem will be with language. Such individuals will have difficulty finding the correct words when speaking but will be able to find their way home. The converse is true when the PET scan detects decreased activity on the right side. Rapoport pointed out that this predictive ability will be especially important once effective therapies are discovered because physicians could then initiate the appropriate therapy earlier.

He also mentioned a preliminary study by members of his laboratory in which regional cerebral blood flow was measured in four AD patients with moderate dementia when their brains were "at rest" and when stimulated by a picture-recognition task. The results indicated that some of their neurons in the region affected by AD were still alive and could be activated to the same extent as those of normal controls. This provides hope that when drugs are found, the brain cells of AD patients will be able to respond to them.

Genetic Heterogeneity

There are three types of AD. About 60 percent of AD cases are sporadic, that is, only one person in a family is affected. When several members of a family are affected but in a random pattern, AD is said to be familial. Patients with this type, which accounts for about 30 percent of the cases, may have a genetic predisposition to AD such as receptor sites for environmental toxins. The remainder of the cases—less than 10 percent—are of the



Patients with Alzheimer's disease lose 40 percent of their brain tissue over the 8- to 15-year course of the disease, as can be seen in the brain on the left from a 71-year-old man who died of Alzheimer's disease. The brain on the right is from a 70-year-old man who died in an automobile accident.

autosomal dominant type, in which people definitely have a gene for AD that is passed from parent to offspring for at least three generations, affects both sexes equally, and forms an identifiable pattern. With this type, patients have an early onset, anywhere from 25 to 52 years of age.

"We've come a long way in the field of AD and in genetics," said Linda E. Nee, who has been trying to sort out the influence of genetic and environmental factors in AD. She has traced the disease through eight generations of a family, the largest such study ever reported. About 50 percent of the offspring were found to be affected, which indicates an autosomal dominant pattern of inheritance.

Molecular genetic analysis of this and three other large families (two of which Nee also investigated) enabled scientists in 1987 to detect a genetic marker for AD on chromosome 21. (This is the chromosome that is also involved in Down syndrome. About 50 percent of the patients with Down syndrome who live past the age of 35 develop a full-blown dementia that is indistinguishable from AD.) However, other investigators have had difficulty repeating this work. Nee believes this may be due to the heterogeneity of AD itself.

But AD is not strictly a genetic disease. In her large study of identical twins, Nee has found that both twins developed AD in only 40 percent of the pairs, a rate similar to that of identical twins catching the polio virus. In one set, a twin has had AD for 13 years yet the other remains normal. This has led her to speculate that environmental causes and more than one gene may be involved in AD.

Nee is currently following 20 families with the inherited form of AD. Their cells and pedigrees are available to other researchers through NIA's cell bank at the Coriell Institute for Medical Research in Camden, N.J.

Combination Therapy

Since 1976 when autopsied brains of patients with AD showed devastation of the

cholinergic system—which uses acetylcholine (ACh) to transmit messages and is important for memory—drug research has been focused on finding ways to replace or build up the levels of ACh.

So far there has not been much success with cholinergic drugs. The most promising ones—such as physostigmine and tetrahydroaminoacridine (THA)—block the normal metabolism of ACh within the brain. But, ACh is not the only neurotransmitter or peptide that is decreased in AD. As Sunderland pointed out, "The cholinergic system takes up only a small percentage of the brain yet 40 percent of the brain is lost by the time an AD patient dies. So, other systems have to be involved." Therefore, he believes that a multiple drug approach will be needed, as in cancer chemotherapy.

Sunderland has been treating AD patients with a combination of physostigmine plus l-deprenyl. In earlier studies, his group found that low doses of l-deprenyl produced modest cognitive and behavioral improvements in a group of 17 patients with AD. At low dosages the drug selectively inhibits the only enzyme—monoamine oxidase-B (MAO-B)—known to be elevated in AD. MAO-B is involved in the breakdown of several important neurotransmitters including dopamine, the one deficient in Parkinson's disease (PD). L-deprenyl was recently approved by the FDA for treating PD.

In the double-blind trial of the combination, 16 patients received either physostigmine plus l-deprenyl or physostigmine alone for 3 weeks, then placebo for 1 week, and then crossed over to the other drug(s) for another 3 weeks. Neither drug had any serious side effects.

This preliminary study suggests that the combination is better than physostigmine alone, but the effect appears to be additive rather than synergistic. "At this point, we'll take any improvement, given the track record of the field at large," said Sunderland.

The benefits from the combination appear to hinge on the patient's ability to achieve and

maintain a high level of physostigmine in the blood. Five patients who did not achieve detectable levels of physostigmine showed no benefit from it or from the combination. The patients with the highest blood levels of physostigmine had modest improvement in memory and when they were receiving the combination therapy, these patients showed more interest in social interactions and had brighter moods. Sunderland is planning to try this combination again with twice the dosage of physostigmine and will also try other different drug combinations.

Sunderland stressed, "There will not be a single magic bullet for AD therapy. Rather we envision more of a combination approach; we're attempting to build one small additive improvement on another, and hopefully get a synchronous effect that will be of even greater benefit than either drug alone." □



Present at the White House when President Bush signed the Americans With Disabilities Act were (standing, from l) Claudia Goad, chair of the NIH advisory committee for employees with disabilities; Rep. Steny Hoyer of Maryland; Joan Brogan, NIH Disability Employment Program manager; Barbara Iba, PHS Handicap Program manager; and Dick Shepard (seated), staff member, president's committee on employment of people with disabilities.



Surrounded by friends who gathered to say goodbye upon her leaving NIH is Kathy L. Russell (c), deputy administrative officer in NCI's Division of Cancer Treatment. Pat Gallaban (r) was among those who wished Russell well on her new post at Georgetown University, where she will work with NCI alumnus Dr. Marc Lippman. Russell will remain president of the board of directors of the Children's Inn at NIH.

Roller-Skating for AIDS Research

The NIH has become accustomed to seeing large, vocal groups—especially critics of NIH policies—march onto the campus to deliver their message. Last month, a small but enthusiastic group from Philadelphia roller-skated onto campus with their message—support for the NIH AIDS research effort. They presented a donation of more than \$700 to Dr. Anthony S. Fauci, director of NIAID, during a reception in their honor.

Eugene Bigay, a 37-year-old industrial electrical worker from Philadelphia, organized the group called "Save Our People" to focus public attention on the AIDS epidemic and to raise funds for AIDS research. The "AIDS Independence Day Skate" began after a rally in Philadelphia, which included performances by more than 50 professional roller skaters.

The seven men and women who made the journey south were accompanied by two small trucks that carried their gear and provided protection from vehicles along Route 40 in Pennsylvania and Maryland. They covered 165 miles in 3 days, braving speeding cars, gravelly shoulders, hilly terrain ("especially in Maryland"), and the dreaded off and on highway ramps. The good part? It didn't rain.

During their visit, the skaters regaled NIAID staff with roller-skating demonstrations and stories about their adventure. Their most poignant tale concerned a homeless man in Philadelphia who wanted to help "those suffering from AIDS" and donated all the money he had—20 cents. Along the way,

many people took time to stop and talk about AIDS and to give them donations.

The diverse group ranged from a national champion speed skater and state champion artistic skater, who roller-skated for the competition and thrill of it, to a landscaper, who skated for the fun of it. But their combined talents and backgrounds melded together to make their mission successful.

Having been forewarned about the potholes in the streets of Washington, they skated down Center Drive towards downtown. The following day, they would carry their AIDS message to spectators at the Fourth of July parade and then return home to start planning their next "AIDS Independence Day Skate"—250 miles from the Statue of Liberty to Washington, D.C. —Ann C. London

Toastmasters Name New Officers

New officers of the NIH R&W Toastmasters Club were named recently to 6-month terms concluding at the end of this year.

They are: Gladys Deibler, president; Louise McHugh, educational vice president; Janice Anderson, administrative vice president; Ann Russo, secretary; Jean Soong, treasurer; Dennis O'Brien, sergeant-at-arms; and Mary Graham, bulletin editor.

The Toastmasters meet every Friday at noon in Bldg. 10, Rm. 2C310. All are welcome. For more information call membership chairman Jasper Cummings, 496-5635. □



Roller skaters for AIDS research show off their wheels to NIAID director Dr. Anthony S. Fauci. They are (from l) Bill Leeman, Paul Luccia, Sarah Clewell, Eric Loeb sack, Kim Krause, Eugene Bigay, and Ceane Rabada.

*Five Weeks Ahead of Schedule***The Child Health and Neurosciences Bldg. 49 Gets 'Topped'**

By Anne Barber

If you have been watching the progress of Bldg. 49, the Child Health and Neurosciences Bldg., as it has grown up from a hole in the ground, then you recently saw a cedar tree and an American flag standing atop the structure located behind Bldg. 10 and in front of Bldg. 30.

"It is tradition to place a cedar tree on top of a building prior to topping off the roof," says Larry G. Eastep, president of Lott Constructors, Inc. It is an old Norwegian custom and belief that a live cedar tree roots out the evil spirits from the wood used in construction.

To get cement to the roof for the final topping of Bldg. 49, a special pump was used. There is only one such pump in the metropolitan area, so everything had to be coordinated.

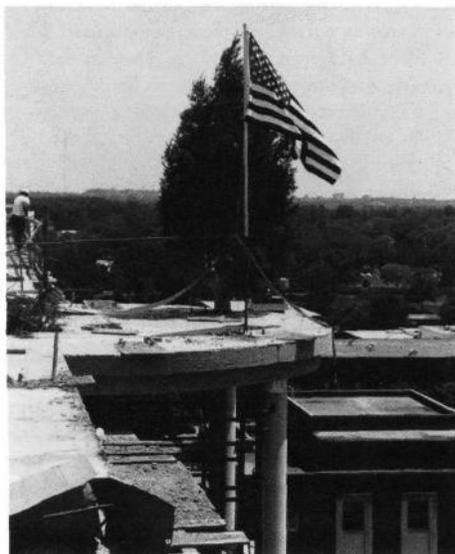
"We appreciate all the help we have been given," Eastep said at the topping-off ceremony Aug. 1. "This is a real example of what teamwork can do."

Dr. Richard G. Wyatt, assistant director for intramural affairs, OD, said, "This job is 5 weeks ahead of schedule and we attribute this to the teamwork between the engineers, architects and scientists. From the beginning of this project and until it is finished, several institutes have and will continue to work together—NICHD, NINDS, NIMH, NIAAA, NIDR, NIA and NEI. Contingent upon funding, this building could be completed as early as late 1992."

Wyatt meets with representatives from each of the institutes every 2 weeks to provide oversight on the design and construction. "We have tried from the beginning to involve the scientists in the design. It has to meet their needs if it is going to work," he says. "This will be a key facility. It will house labs, offices and animals. The labs will be located close to the animal facilities."

Dr. Duane Alexander, NICHD director, stated, "This is the Silvio Conte Child Health and Neurosciences Building. I know he would feel proud and happy to see this building going up so fast because he worked so hard to provide us with this facility. At the initial groundbreaking ceremony," Alexander continued, "Conte said, 'This is one of the happiest days of my life.' I know if he were here today, the topping off would be another happy day in his life. I look forward to him being here for the dedication when the building is completed."

"It will be the most modern facility of its kind in the country that entails scientific work



Prior to the topping-off ceremony, a lone cedar tree and an American flag stand atop the new Child Health and Neurosciences Bldg.

on diseases that particularly affect children and their mental functions.

"It is only appropriate that we begin the Decade of the Brain with the construction of this building that is dedicated to research on children with neurological and mental disorders."

Dr. Boris Tabakoff, scientific director of NIAAA, said, "We are one of the two institutes from ADAMHA that will be housed in the building."

"It is exciting and amazing how quickly the structure has risen out of a hole in the ground," he says. "It's awe-inspiring. It gives confidence that NIH will continue to grow and be a viable place. For our own program, it is a godsend. Half of our clinical program is located off campus and isolated from NIH life. It is hard to keep them in the mainstream. Now, they will be able to join their own colleagues."

"So," continues Tabakoff, "we need to compliment the budget people, the engineers, architects and workmen in doing a great job. It is a real confidence-builder for everyone."

"Conte should be complimented since it was his perseverance that got us here from the original concept begun in 1979. The project was put on hold during the early 1980's but in 1985-86 the plan was revised. Thanks to his help and the hard work of Dr. James Wyngaarden (former director of NIH) and

others, the project got under way again. From the groundbreaking to now, it has been a very efficient and productive process."

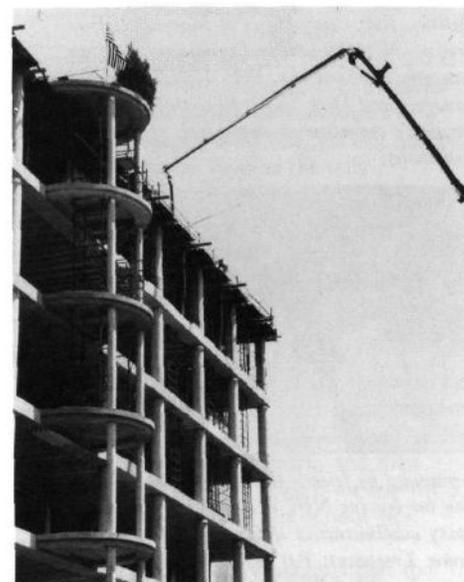
"The construction will be performed in four phases," says Steve Hagan, Division of Engineering Services' project officer for the building. "Lott Constructors won the bid for the first two phases—foundation and superstructure. We will begin the third phase this month."

"This fast-track approach requires incredible cooperation and coordination between NIH; TKLP, the architectural and engineering firm; CRSS, the construction manager; and the various construction contractors."

"I want to especially thank our Division of Procurement, particularly Frank Mallalieu, contracting officer, and Molly Eng and Pat Calhoun for their support in executing this difficult process."

John Pallas, chief of NIH's Design and Construction Branch, noted, "I am very pleased with the cooperation and excellent progress shown by Lott Constructors on the project."

Says Lott's Eastep, "The building has gone up better than we expected. We attribute this to teamwork on the part of NIH, the architects and our subcontractor. It has been a good, safe job throughout. We like it here, it is a good place to work but now we just need



You can see the cement pipeline as it reaches the top of the 7-story structure for the pouring of the roof. There is only one such special pump that can perform this function in the metropolitan area.



Showing their pleasure at Bldg. 49's topping-off ceremony because the structure is running 5 weeks ahead of schedule are (from l) Ray Kirby, superintendent for Lott Constructors; Dr. Richard G. Wyatt, OD's assistant director for intramural affairs, and Dr. Duane Alexander, NICHD director.

Photos: Judi Bolander

to clean up our mess and let the new contractor move in and begin his work.

"It is satisfying to look back at the end of the day and see what we accomplished. Also to be able to drive by 10 years later and still see it. I hope it will contribute to further knowledge that will save a lot of lives."

Bldg. 49, the first new building on campus in 10 years, was a very long time in coming. Silvio Conte, the ranking minority member of the congressional appropriations committee charged with NIH oversight, fought for the child health facility for more than a decade. At the groundbreaking ceremony on Oct. 4, 1988, Conte said about the building, "It is the proudest achievement in all my years of office."

The Child Health and Neurosciences Bldg. will house some 500 employees from seven different institutes, with NICHD occupying the most space. Also contained within the building will be a modern primate facility fully accredited by AAALAC. The construction, begun in July 1989, is slated for completion in late 1992. □

Tour New York City

See America's largest and most exciting metropolis, all dressed up for the holidays! See the Rockettes' Christmas show at Radio City Music Hall, cruise to the Statue of Liberty, and take a sightseeing tour of Manhattan with a local guide. And have plenty of time left for shopping! This trip includes two nights first class hotel accommodations, four meals, all sightseeing and admissions as per itinerary, all taxes and service charges, a professional tour guide, and transportation via deluxe motor-coach. Date for the trip is Nov. 30. For prices and itinerary, call or stop by the R&W Activities Desk, Bldg. 31, 496-4600. □

David Wolff Joins Fogarty Center Staff

Dr. David A. Wolff has been appointed to head the Fogarty International Center's International Research and Awards Branch (IRAB).

He came to the Fogarty Center on Aug. 6 from the National Institute of General Medical Sciences, where he served as deputy associate director for program activities.

As chief of IRAB, Wolff is responsible for the management of a number of research and research training programs, including international research fellowships for foreign scientists to conduct research at U.S. institutions, and senior international fellowships for senior U.S. scientists conducting collaborative research abroad. Wolff will also implement the research and research training aspects of the FIC Eastern European and Latin American initiatives.

Wolff received his Ph.D. degree in microbiology/virology from the University of Cincinnati. He served on the Ohio State University faculty from 1964 to 1978, attaining the rank of professor in the department of microbiology. During that period, he also conducted collaborative research with scientists



Dr. David Wolff

at Uppsala University in Sweden and at Basel University in Switzerland.

He joined the NIH Grants Associate Program in 1978, and held a position at the National Institute of Dental Research before joining NIGMS. □

NIH Health's Angels Al Lewis 10-Mile Race Scheduled, Sept. 16

Sunday, Sept. 16, is the date for the running of the 15th Annual Health's Angels Al Lewis Memorial 10-Mile Run. The race will also feature a 2-mile fun run for those not ready to take on the longer distance and a 1-mile run for children 12 and under. The D.C. Road Runners Club will cosponsor the event and will provide male/female age group awards for the 10-mile run.

The Health's Angels will have awards for the fastest NIH runners male and female, and again the ever-popular "Unbody" award will be presented to the fastest runner whose weight equals or exceeds 2.5 times his/her height in inches.

The 1, 2, and 10-mile races will be run on the bike path in Rock Creek Park, starting and finishing at the Kengar Recreation Center in Kensington. The center is located on Beach Dr. between Knowles Ave. and Wexford Dr., about 3 miles from NIH.

Race time is 8 a.m. sharp for the 1-mile, 8:15 a.m. for the 10-mile, and 8:20 a.m. for the 2-mile fun run. Entry fees are \$3 (non-members) and \$1 (Health's Angels/DCRRC members) for the 10-miler. The 2-mile fun run is \$1 for all entrants and the 1-mile run is free. Registration will be held at the race site, so arrive early since parking is limited at the center.

For more information call Tom Roach, 497-1517. Note: Volunteers are desperately needed! □



Winnie Lumsden retired recently after nearly 29 years of service to the federal government, most recently as NCI's committee management officer. Since December 1980, Lumsden managed the institute's public advisory committees. Prior to working for NCI, Lumsden worked for ADAMHA from 1973 to 1980. She managed the document control and micrographic staff and also was the project officer for micrographic contracts for the scientific program's Analysis and Retrieval Branch, both within the Office of the Administrator. Prior to that she worked for NINDS.

NINDS

(Continued from Page 1)

steady pumping of the heart. Implanted in deaf ears, cochlear prostheses restore perception of sound. And for thousands paralyzed by spinal cord injury, early devices show promise of making some voluntary movements possible again.

One such device was recently pioneered by NINDS contractor Dr. Hunter Peckham and his colleagues at Case Western Reserve University in Cleveland. Their prosthesis enables people paralyzed in all four limbs to grasp objects with their hands, making it possible for them to perform such tasks as brushing their teeth, picking up books, and eating with normal utensils.

The device uses a microcomputer, mounted in a small box near the patient, to generate electrical signals for controlling muscles. These signals travel through fine wires to electrodes planted inside the muscles of the paralyzed arm and hand. By signaling with their left, unparalyzed shoulder, patients control the prosthesis. For example, moving the left shoulder forward tells the right hand to close. Thus, the prosthesis triggers contractions of the appropriate paralyzed muscles—much in the same way a radio transmitter commands a remote control car.

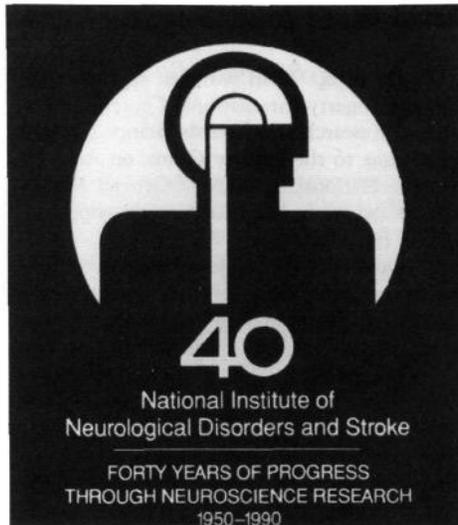
Such devices, however, are a far cry from nature. They do not restore fluid natural movements, nor do they return the sense of touch. Even with the most modern technology, there is a gap between natural neural control and that provided by prostheses, according to Neural Prosthesis Program director Dr. F. Terry Hambrecht.

"As an example," Hambrecht explained, "the auditory nerve of a normal person has 30,000 separate nerve fibers. Each one conveys a different message from the ear to the brain." In contrast, the first auditory prosthesis had only one channel. "Our most sophisticated auditory prosthesis at present has only 22 channels," Hambrecht noted. "So we're reducing a system that normally has 30,000 different inputs to at most, right now, 22."

"We would like to continue the trend toward more closely mimicking the normal nervous system—adding in more and more independent channels," Hambrecht said.

Scientists working toward this goal are making their devices smaller and more selective to specific nerve fibers. Smaller devices mean more electrodes can be implanted in the body's cramped spaces. "The nervous system wasn't designed to have implants put in it," Hambrecht said, "so, in most cases, there's little extra room."

One device that scientists are shrinking to natural scale is a recording electrode. Nerves communicate in signals that measure only mil-



lionths of a volt. And nerve fibers are thinner than a human hair. In order to work, these listening devices—called recording microprobes—have to be both small enough to implant near slender nerve fibers and sensitive enough to detect minute electrical signals.

If successful, recording microprobes will tap into the body's natural control signals. One disadvantage of current prostheses is the need to use unnatural signals such as shoulder shrugs to direct movement. Microprobes,

A Communications Breakdown

Nearly every move you make begins as a signal from command centers in the brain. When you read to the end of this page, for example, your brain will issue a signal to turn to the next. The message, in the form of an electrochemical signal, will speed down your spinal cord. It will travel out of the cord to nerves in your shoulder, arm and hand. These so-called peripheral nerves will then trigger the appropriate muscles to contract, enabling you to turn the page.

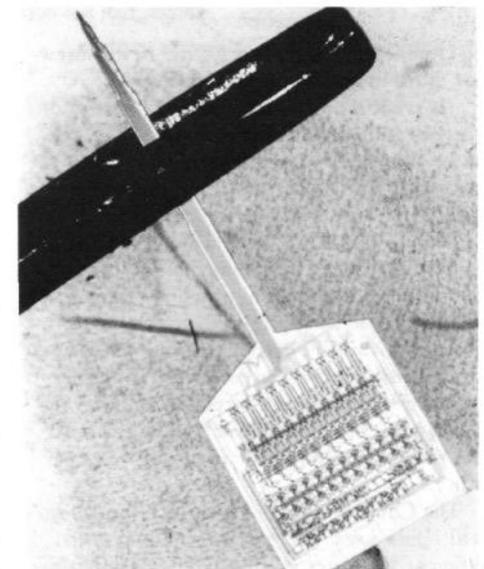
Like a downed phone cable, however, damaged nerves lead to poor communication. In a person whose arms are paralyzed by spinal cord injury, the brain's command begins normally but is blocked in the spine by damaged nerves. And although the muscles and nerves in the hand may be in healthy condition, they never receive the message to move.

Thus, though most of us give little thought to turning a page, dialing a telephone or drinking from a cup, the communication breakdown in those with higher level spinal cord injuries can make these tasks impossible. In the words of NINDS contractors at Case Western Reserve University, "The loss of motor and sensory function in the hands of high-level quadriplegic individuals has devastating consequences that can result in the loss of independence."

however, could eavesdrop on commands at their source in the brain.

A second concern involves the artificial sensors being developed to replace the lost sense of touch. These sensors are now worn outside the body, where they report information on hand position and force. As Hambrecht notes, "When the body's sensors get banged, they can heal. But when our artificial sensors get banged, they break."

In contrast, recording microprobes would detect signals sent by natural sensors. "In your fingertips, even if you're paralyzed, all of the natural force sensors are there," Hambrecht explained. "They're sending signals to your spinal cord. Once they get to your spinal cord these signals are interrupted. But if we could detect the activity of the sensors we wouldn't need artificial sensors—we could use the natu-



This microprobe, shown passing through the eye of a needle, may someday help paralyzed patients control motor functions from an implanted site in the brain.

ral sensors." He says scientists are also scaling down the other components of neural prostheses such as the stimulating electrodes that trigger nerves and muscles.

Fortunately, some of the same advances that have made personal computers and pocket calculators possible have also made shrinking prostheses easier. "Technology, in the integrated circuit field especially, is moving by leaps and bounds," Hambrecht said. In the past 10 years, he noted, new technology has brought about a tenfold reduction in the size of devices.

Hambrecht said scientists are also charting better maps of the nervous system's functions, so that when smaller electrodes are developed, they can be implanted in more effective locations. Current bladder-evacuation prostheses, for example, stimulate a whole nerve that con-

tains thousands of nerve fibers. Some of these nerve fibers trigger bladder contraction. Others cause the gate out of the bladder, or sphincter, to close. Like stepping on both the accelerator and the brake, stimulating these two types of nerve fibers at once produces mixed results.

In the lower spinal cord, however, these nerve fibers are not bundled together. By placing stimulating microelectrodes in this area, Hambrecht explained, scientists could gain independent control of functions like sphincter and bladder contraction.

"This would have applications not only in emptying the bladder in spinal cord-injured patients but it would also have applications in some of the people who can't control their flow of urine—what we call incontinence," Hambrecht said. Eventually, he added, this technique might even restore sexual function in paralyzed people. □

Six Join Nursing Research Council

Six new members have been appointed to the National Advisory Council for Nursing Research, the principal advisory body of the National Center for Nursing Research.

The new members are Patricia G. Archbold, chairperson of the department of family nursing at Oregon Health Sciences University in Portland; Mara M. Baun, director of the Niedfelt Nursing Research Center, University of Nebraska Medical Center in Omaha; L. Edward Bryant Jr., partner and chairman of the health law department at Gardner, Carton & Douglas in Chicago; Dr. Hesook Suzie Kim, professor in the college of nursing, University of Rhode Island in Kingston; Dr. Jean L. J. Lum, professor of nursing, University of Hawaii at Manoa; and Louise Woerner, chairman and chief executive officer of HCR in Washington, D.C. and Rochester, N.Y. □



Animal care staff members (starting at second from l) Victor Wells, Lorrie Hall, Charles Smith and Tara Dumas (not shown), who are employees of Program Resources, Inc., an NCI contractor, have successfully completed a comprehensive examination in laboratory animal care and husbandry, and are now certified AALAS assistant laboratory animal technicians. Their supervisor, Mary Rauschenberg (far l) also passed her examination and is now a certified AALAS laboratory animal technologist.

Seminars for Scientists Highlight Fall Computer Training

School starts in September, and the fall program of the DCRT Computer Training Program offers more opportunities than ever to learn about the application of computers to science.

New seminars on quantum mechanics, image processing, laboratory data display, and cluster analysis reflect DCRT's direct involvement in the NIH research mission. Back by popular demand are seminars on drawing DNA sequences with the computer, recurrent problems in data analysis, and MLAB on the PC.

The new NIH Utility Network (NUNet) that is joining all the local area networks on campus is the topic of two seminars, one addressing how to use the facilities available through NUNet and the other discussing the architecture of the network from a highly technical perspective.

Several new seminars are designed to give students an overview of the computing resources at their command. "VAX VMS Resources at NIH," surveys the tools and public domain software available to users of these systems in the NIH research environment. "Overview of Services," looks at the services and software supported by the Computer Center Branch. This is a nice counterpoint to the "Welcome to the NIH Computer Utility," seminar that offers machine room tours of the Convex and IBM 370 facilities and emphasizes the mainframe hardware capabilities.

"Orientation for Account Sponsors," is a seminar explaining the responsibilities of account sponsors and the resources available to help them manage their accounts.

"Memory Management on the PC," "Recovering Macintosh Disks and Data," and "Mac to DOS and Back," are short seminars offering practical help to personal computer users. "Macintosh Shareware," addresses the important issue of how to take advantage of shareware safely while avoiding computer virus contamination. Two new presentations describe the use of the "Omnipage" scanner for beginners and experienced users.

UNIX-based systems are coming into wide use in the scientific community. The number of training opportunities in this area is expanding rapidly. New seminars, "Welcome to UNIX," "Using the Internet," "Introduction to the X Window System," and "Plans for UNIX Workstation Support at NIH," offer brief presentations on topics in this area. "Convex Topics," is a three-part seminar on subjects of interest to users of the Convex supercomputer.

In response to many requests from NIH researchers, the Computer Center will support a new 5-day course, "C Language Fundamentals." A pilot version of this class was run

during the summer and students agreed that it was an excellent but demanding course. For those ready to meet the challenge, the course offers the fastest path to productivity in C language programming. A followup 2-hour workshop has been scheduled for the following week to allow students additional time for hands-on practice with an exceptional instructor. "Getting Started with C," will offer an introduction for students who have not begun learning C on their own.

Finally, stepping back from day-to-day practical details, Richard Feldmann will present "The Role of Computers in Structuring Change in the Late 20th Century."

For a complete description of all 60 courses and seminars in the DCRT Computer Training Program for Fall 1990, consult the Computer Training Courses and Seminars brochure or enter the ENTER TRAINING command in WYLBUR. Copies of the brochure are available from the Computer Center's Technical Information Office, Bldg. 12A, Rm. 1015, 496-5431, or by using the ENTER PUBWARE command. ICD personnel offices also have copies.

Applying for any of these courses or seminars is easy. Just complete the one-page nomination form on the last page of the brochure and mail or fax it to the Technical Information Office, 402-0537. For seminars, telephone registrations are accepted; just call the Computer Center's Training Unit, 496-2339. As always, there is no charge for any course or seminar in the DCRT Computer Training Program. □



Winners of a quilt crafted by Mary Emerick, mother of the late Raymond Emerick, a long-time NIH leukemia patient, are Esther and Stuart Newman. The couple here discusses plans for placement of the quilt with Kate Higgins (l) resident manager of the Children's Inn. The quilt raffle raised \$1,033 for the inn. The Newmans' winner was among 20 raffle tickets that they bought.

Kennedy Foundation Awards Honor NICHD Grantees

By Robert Bock

The director of a mental retardation research center program that is funded by the National Institute of Child Health and Human Development and two grantees funded by NICHD have been honored by the Joseph P. Kennedy Jr. Foundation for their outstanding contributions to the field of mental retardation research.

The awards were presented on July 15 in Hyannisport, Mass., at a ceremony that also celebrated the 100th birthday of Rose Fitzgerald Kennedy. NICHD's director, Dr. Duane Alexander, represented the institute at the ceremony.

Dr. Ann P. Turnbull, director of the Beach Center at the University of Kansas in Lawrence, was one of three women to receive the first Rose Kennedy award, which consists of a monetary gift and a gold medal bearing the likeness of Mrs. Kennedy. The award recognizes women who have made major contributions to the mental retardation research field. The Kansas center is one of 12 Mental Retardation Research Centers funded by NICHD.

Under the leadership of Turnbull and that of her husband, H. Rutherford Turnbull III, the Beach Center has become one of the nation's leading research and training centers in the field of disability. The mother of a son

with multiple disabilities, Turnbull has helped shape legislation to give parents a primary role in developing programs to meet their children's needs and has also served as a teacher, author and researcher.

Dr. Edward Zigler received the Kennedy Foundation Scientific Leadership Award for his pioneering work in mental retardation and early childhood education. Zigler has written numerous groundbreaking books on child development. In 1964, he was appointed to the first Head Start advisory committee and he later became director of the Federal Office of Child Development. He is now director of the Bush Center in Child Development and Social Policy at Yale University.

Zigler is the principal investigator of an NICHD-sponsored 22-year project to chart the developmental progress of mentally retarded individuals. The program also includes behavioral and biological studies of several neuropsychiatric disorders of childhood.

Dr. Marty Wyngaarden Krauss received the Future Leader in Mental Retardation Research Award. Director of the Starr Center for Mental Retardation Research at Brandeis University, Krauss has conducted research on the effectiveness of services for aging mentally retarded individuals and on the impact of early intervention services on disabled infants and their

families. Krauss is also the administrator of an NICHD-funded program to train doctoral candidates in mental retardation research and social policy at the Heller School at Brandeis. The award was presented at the ceremony by her father, Dr. James Wyngaarden, former director of NIH.

The Joseph P. Kennedy Jr. Foundation was established in 1946 by Ambassador and Mrs. Joseph P. Kennedy to honor their eldest son, who was killed in World War II. The foundation seeks to prevent mental retardation and to improve the way society deals with people who are already mentally retarded.

In 1962, President John F. Kennedy signed legislation creating NICHD, the first institute with a major interest in normal human reproductive, growth, and developmental processes. A year later, President Kennedy authorized the establishment of the 12 Mental Retardation Research Centers, which were to be supported by grants from the NICHD. NICHD grants have enabled each of these centers to buy scientific equipment and supplies, hire technical assistants and operate other research resource facilities. Because of these investments, more than 40 disorders that can produce mental retardation can be prevented or reversed, and cures have been found for some. □

NIH Welcomes New Fogarty Scholars from California

Not even a hot, humid summer can slow the pace of scientific progress. Braving Washington's weather, two eminent California scientists recently took up appointments as Fogarty International Center scholars-in-residence.

The two are Dr. Gunther Stent, chair of the department of molecular and cell biology at the University of California, Berkeley, and Dr. Manuel F. Morales, professor of physiology at the University of the Pacific in San Francisco.

The Scholars-in-Residence Program offers eminent scientists from around the world the chance to cast off administrative chores and pursue advanced studies at NIH. Begun in 1969, the program has brought 174 world-renowned scientists to the NIH to conduct research, organize conferences, and interact with intramural investigators.

Stent was nominated for the program by Nobel laureate Dr. Carleton Gajdusek, chief of the Laboratory of Central Nervous System Studies in the National Institute of Neurological Disorders and Stroke.

Stent is one of the world's foremost experts in molecular biology and neurobiology, and has written extensively on the history and philosophy of science. He was a pioneer in

bacteriophage genetics, making major contributions to the understanding of DNA replication. He provided the first molecular evidence that genetic recombination involves breakage and reunion of DNA molecules.

Among his significant neurobiology studies was the analysis of the neuronal generation of animal movements. Using the leech as a model, he identified the cellular and neurophysiological bases of two rhythmic movements—heartbeat and swimming.

Stent's philosophical stances have been termed "provocative" by many. He has written about such topics as the ideological, historical, and personal factors surrounding the origins of molecular biology, and the relationship between biology and morality.

During his Fogarty tenure, Stent plans to write a monograph on developmental neurobiology.

Morales was nominated to be a scholar by Dr. Richard Podolsky, chief of the Laboratory of Physical Biology of the National Institute of Arthritis and Musculoskeletal and Skin Diseases.

Morales' career aim has been to explain how energy is "transduced" (converted from one form into another) in certain biological

devices. He has specialized in how this occurs in muscle—in how energy stored in substances is converted to mechanical work. His approach and methods have often been those of physics and physical chemistry. For example, he has recently used novel fluorescence spectroscopy to achieve his results.

Morales has contributed several ideas to current thought on how energy transduction occurs.

He plans a busy tenure as a scholar; he hopes to interact with several intramural scientists, give lectures, and organize an international conference on biological engines. □

Fish on the Chesapeake

R&W has chartered the "Lisa S." from Scheible's Fishing Center in Ridge, Md., for a day of fishing on the Chesapeake Bay. Date is Sunday, Sept. 23 for this relaxing, fun-filled day. Cost is \$38 and includes 8 hours on the boat, your bait, tackle and fishing license, plus a hearty lunch (you bring the beverages of your choice). For more information, contact the R&W Activities Desk, 496-4600. □

TRAINING TIPS

The NIH Training Center of the Division of Personnel Management offers the following:

Courses and Programs *Starting Dates*

Management and Supervisory 496-6371

Recognition Secrets: Innovations for Rewarding Today's Workers	9/9
Managing Stress, Maximizing Effectiveness	9/11
Effective Communications	9/11
Managing Outstanding Performers	9/20
Hands-On Animal Techniques Workshop: Rodent Techniques	9/26

Office Operations Training 496-6211

Delegated Acquisition	9/17
Introduction to Working at NIH for New Support Staff	9/17
Management/Leadership Skills for Senior Level Secretaries	9/10

Personal Computer Training 496-6211

Lotus 1-2-3 Advanced Topics	8/27
Intro to Word Perfect 5.0	9/11
Word Perfect 5.0 Advanced Topics	9/17
Intro to dBase III Plus	9/18

Training and Development Services 496-6211

Personal Computer training is available through User Resources Center (URC) self study courses. There is no cost to NIH employees for these hands-on sessions.

The URC hours are:

Mon.-Thurs.	8:30 a.m. — 7 p.m.
Friday	8:30 a.m. — 4:30 p.m.
Saturday	9 a.m. — 1 p.m.

Training Center, DCRT, and other training information is available on WYLBUR. Logon to WYLBUR and type ENTER TRAINING



Enjoying instruction on new Macintosh computers donated to the Children's Inn at NIH are patients Jeffrey Hunt (r) and Paul Aina (second from l). Providing lessons are Bill Grimsley of Falcon Microsystems, which donated "Appleworks GS" software and Karen Siegel of Apple, which gave three Apple II GS computers and printers.



Andreano Johnson (l), recent resident of the Children's Inn; Brenda Small (c), former Clinical Center patient; and Kathy Russell, president of the inn's board of directors, examine the new 1991 Toyota Previa van donated recently to the Children's Inn by the Mid-Atlantic Toyota Distributorship. Valued at \$21,000, the air-conditioned, FM-stereo-equipped vehicle will give inn residents and their families easy access to local grocery stores and shopping centers.



James D. Doyle (l) of the Contracts and Procurement Management Branch, NIEHS, is an Army Reserve major and commander of an airborne company of parachute riggers at Ft. Bragg, N.C. He and his unit recently participated in the Eisenhower 50th anniversary celebration of the airborne assault at Ste. Mere-Eglise, France, which featured a parachute drop at the site of the drop in 1944. Doyle is a veteran of more than 100 jumps. As a result of the exercise, he and his men were awarded the coveted French Airborne Wings, each with a serial number engraved on the back and inscribed in the annals of the French Airborne School. Doyle here readies for the jump before boarding the aircraft.



The Lions and Lionesses of District 22-C recently raised more than \$50,000 for construction of a playroom at the Children's Inn. Check presentation took place at the office of Maryland Rep. Connie Morella (fourth from r). Also on hand were (from l) Shirley and Bill Yobo, James Belcher, Ruth and Michael Simmons, Joseph Sacco, Donald Wilson, Nancy Sacco, Sidney Pennington, Charles Mills, Randy Schools and C. Louis Napper.

*New Era in Modeling***Molecular Graphics Workstations Give Scientists Handle on Proteins**

By Anne P. Enright

A number of NIH scientists can now graphically take apart molecular structures for careful scrutiny on computer screens in their own labs. The acquisition of molecular graphics workstations has done much more than increase the speed and accuracy with which protein structures can be modeled; it has enabled scientists from most NIH buildings to interact through a computer network system.

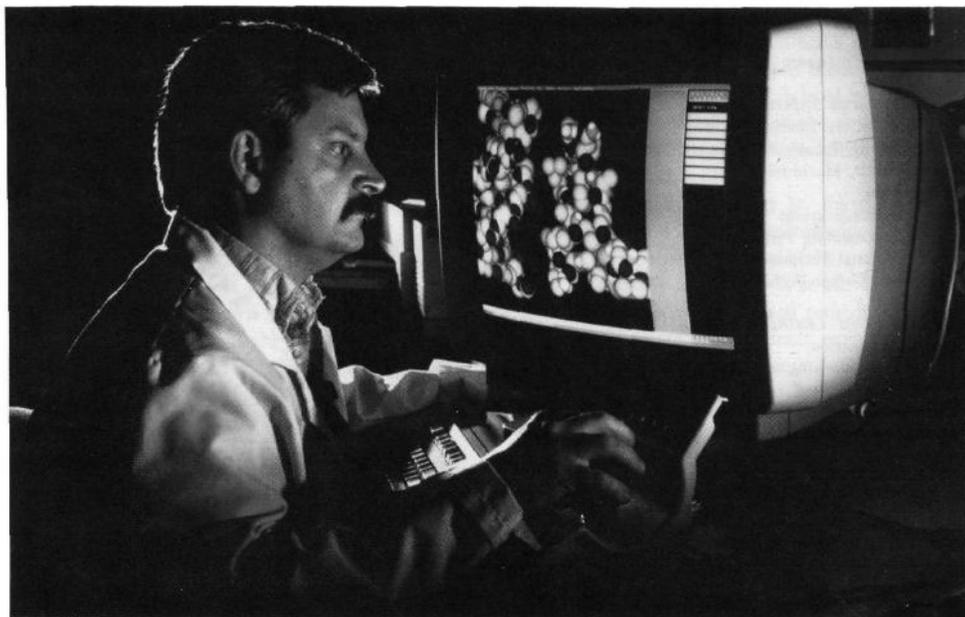
The Division of Computer Research and Technology has been instrumental in putting this innovative technology into the hands of those examining molecular structures. "This has ushered in a new era in our ability to work with protein structures," said Dr. George Michaels, a senior staff fellow for DCRT who conducts research with the Laboratory of Molecular Genetics, NICHD.

A novel cooperative NIH-wide plan, initiated by DCRT computer specialist Richard Feldmann, made machines available to scientists after approval of individual research proposals by a committee of the NIH scientific directors. NIH contracted for more than 40 individual molecular graphics workstations and a site license for applications software. These machines have been installed in most NIH locations, including Research Triangle Park, N.C., and the Rocky Mountain Laboratory, NIAID, in Hamilton, Mont.

The workstations place powerful molecular design software packages, including QUANTA and CHARMM, into the hands of laboratory scientists. The packages help users visualize protein structures in three-dimensional space; the workstations even have special 3D glasses and an enlarged screen for more effective displays. Investigators are also using this leading-edge equipment as a predictive tool to model the three-dimensional shape of a structure based on changes in proteins and nucleic acids. "This completely revolutionizes the way we think about protein structures," said Michaels, repeating a response he has heard from other scientists using the facilities.

For those directly involved in solving the molecular structure problems of proteins and nucleic acids, the new system allows for continual manipulation of a modeled structure on the computer screen. Molecules viewed in stereographics give scientists a "full 3D understanding for how this structure exists in nature," Michaels explained.

In his own work on structural analysis of transcription factor proteins, for instance, Michaels often collaborates with other researchers. When a colleague at Columbia University discovered a new structure,



Dr. George Michaels of DCRT works at a molecular graphics workstation that permits him to take apart and scrutinize molecules on the computer screen in front of him.

Michaels used compatible software to do experiments on this new data as soon as the information arrived. Michaels also praises the network capabilities of the new system; he recently was able to access his files, located on his workstation in Bldg. 6, from Tokyo. His vision of the application of this technology is to move "from molecular graphics workstations to molecular biology workbenches."

Besides conceptually changing research techniques, the availability of the individual workstations greatly enhances the tools immediately available to the scientist in the laboratory. "The new arrangement has saved scientists from having to traipse across to Bldg. 12A with all of their things. Now, they can just crank up their machine and go at it," said Feldmann.

DCRT has trained scientists to operate the new equipment and continues to support them in their research efforts. Steve Bailey, computer systems programmer of the DCRT Computer Center Branch, takes calls from scientists needing assistance with the system and Rob Malik, computer scientist for the Computer Systems Laboratory, gives users on-site help. As part of this continued assistance, one QUANTA seminar addressing individual needs of the scientists who use this software has been conducted and others are planned.

In addition the distributed systems section of the Computer Systems Laboratory has a commitment to support scientists using the new technology. Plans are under way for additional enhancements: one software application

will automatically distribute system updates to each workstation; large amounts of disk storage will soon be available through the network.

Besides offering high-powered graphics capabilities, the workstations have served a unifying function across NIH facilities. Laboratory scientists can now be connected through computer networks to the Convex system, for example, in order to perform difficult computations. With an increasing need for powerful computing, this connection is quickly becoming necessary. "In the future, network access to larger machines will be critical," said Michaels.

An assessment of the impact of the innovation at this point would be premature, according to Feldmann, since the workstations have only been in operation a short time. The full effect of the researchers' experience with the technology may not be felt soon. "The younger generation of scientists is much more computer literate," said Feldmann. "The greatest impact will be with this emerging generation." □

Hay Fever Sufferers Sought

NIAID/FDA seeks volunteers who have spring, fall or year-round hay fever symptoms to participate in a study involving allergenic skin testing. Participants will be paid. Send written request to: J. Matthews, Bldg. 10, Rm. 420, or Bldg. 29, Rm. 201. □