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The NIH Record

NICHD Turns 25

Researching Development—From Cells to Selves

It came to NIH in 1962, and it was different, by design. The National Institute of Child Health and Human Development was created after a task force report to President Kennedy charged that research into children's growth and development—physical, intellectual and emotional—was "severely handicapped" by the absence of a central coordinating point. The report called for a new institute at NIH to launch a "concentrated attack" against disorders of human development.

While most other NIH institutes must focus their efforts on conquering particular diseases, the new NICHD aimed instead to provide insights into the physical and mental evolution that occurs between conception and adulthood.

Now, after 25 years of research into normal development, NICHD is well into its own adulthood. And it is moving more toward applying the basic knowledge gained from its early years to preventing disease and disability, providing a healthier future for all children.

Director Duane Alexander has seen the institute grow, having come to NICHD in 1968 after his residency in the Johns Hopkins University department

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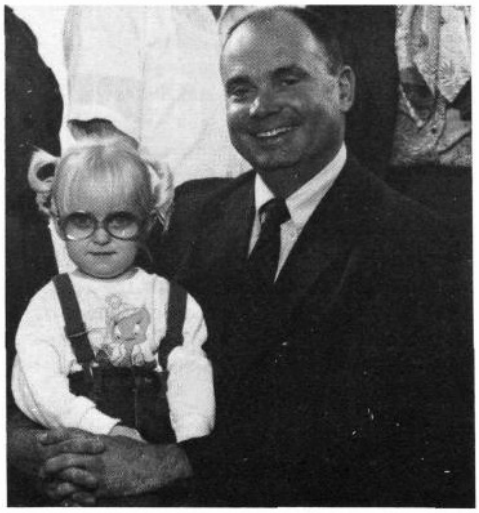

Dr. Duane Alexander, NICHD director, visits with a young patient in an intramural research study.

On the Waterfront

The Ebb and Flow of NIH Creeks

Quiz: What meanders across the NIH campus every hour of the day and night yet is almost invisible?

Answer: Two creeks—one named the "NIH Stream" and the other, somewhat less poetically, "Stream G."

The two creeks are not actually creeks, but mostly storm-water runoff areas, says Tom Cook, chief of grounds maintenance, who has been at NIH for the past 27 years.

And they aren't really invisible. Many NIH'ers notice and enjoy them.

Two people who love the creeks are Dr. Charles H. Zierdt and his wife Willadene, both of whom work in the Clinical Pathology Department of the Clinical Center.

The Zierdts are like NIH's own Sierra Club. They appreciate the beauty of nature and encourage others to preserve it.

What concerns the Zierdts, and many others here these days, is the marginal health of our creeks.

"The creeks are polluted," said Dene Zierdt, a microbiologist who has enjoyed strolls by the creek—sometimes just to pick up trash—for the 29 years she has worked here.

"Phosphates are killing the creeks," she adds.

Not only phosphate levels, but also nitrate levels are elevated (but not extraordinarily so), says Sven Rodenbeck of the Environmental Protection Branch, Division of Safety.

"Both streams are typical of urban runoff," he explained. The high nitrate level is the result of lawn fertilizers applied in the neighborhoods surrounding NIH. Phosphates come

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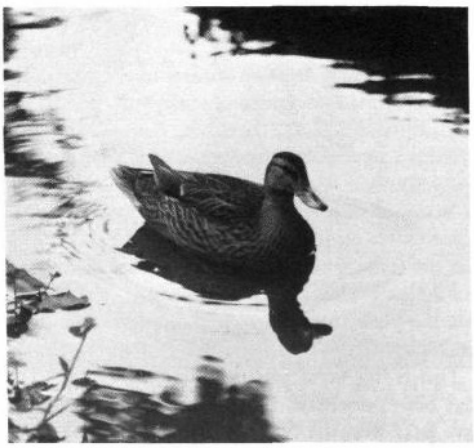

An inquisitive inhabitant of the NIH Stream.

All Have NIH Ties

Lasker Awards Honor Four Investigators

The psychiatrist who started a revolution in the drug treatment of manic-depressive illness, and three molecular geneticists who showed that DNA is rearranged to form the genes for all antibodies, are the winners of the 1987 Albert Lasker Medical Research Awards. All four have intramural and/or extramural ties to NIH.

The winner of the 1987 Albert Lasker Clinical Medical Research Award is Dr. Mogens Schou, professor and research director of the psychopharmacology research unit at the Aarhus University Psychiatric Institute, Risskov, Denmark. Schou proved that the drug lithium is effective against manic-depressive illness—a breakthrough that led to drug treatment for many mental disorders.

The three winners of the 1987 Albert Lasker Basic Medical Research Award are Drs. Susumu Tonegawa, Philip Leder, and Leroy Hood. Tonegawa is professor of biology at the Massachusetts Institute of Technology Center for Cancer Research. Leder is chairman of the department of genetics at Harvard Medical School, and is a senior investigator at the Howard Hughes Medical Institute. Hood is chairman of the division of biology at the California Institute of Technology.

Schou was an NIMH grantee for one year. He has studied manic depression, an illness affecting an estimated 47 to 97 million people—1 to 2 percent of the world's 5 billion population. An estimated 800,000 to 1.2 million people in the U.S. suffer from this disorder. The disease, which tends to run in families, is believed to be associated with inherited biochemical abnormalities in the brain.

Initial research on lithium and manic-depressive illness by the late Australian researcher, Dr. John Cade, had not convinced psychiatrists of the time that this complex mental disorder could be treated medically, by a drug.

In 1952, Schou began pioneering studies comparing manic-depressive patients on lithium with others receiving a placebo. His conscientious methods and convincing results persuaded psychiatrists to begin prescribing lithium for hundreds of thousands of manic-depressive patients and patients suffering from recurring depressions.

Lithium's success in the management of manic-depressive illness prompted the development of new generations of drugs to treat mental illnesses, and led to the emergence of psychopharmacology—the medical treatment of mental disorders.

Tonegawa, who currently holds a 7-year

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Lasker

(Continued from Page 1)

grant from NIAID, proved that the DNA in antibody-making cells is shuffled and reshuffled to make new genes. He made this discovery in a 2-year series of arduous experiments in which he cut up the DNA into small pieces and, using the limited techniques available at the time, searched the pieces for parts of antibody

Dr. Mogens Schou

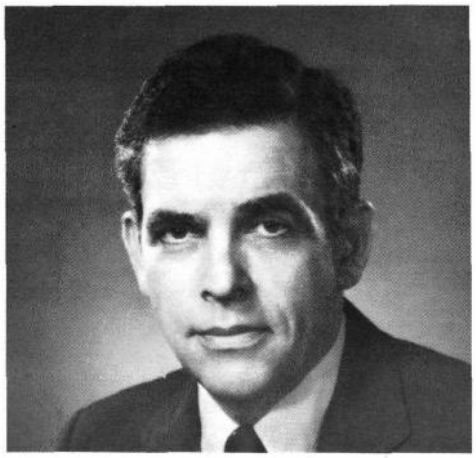
genes. In doing so, he found important ways in which the diversity of antibodies is increased.

His research showed that an individual's genes do not necessarily remain the same throughout life, and that specific parts of the DNA are continually rearranged by specialized cells.

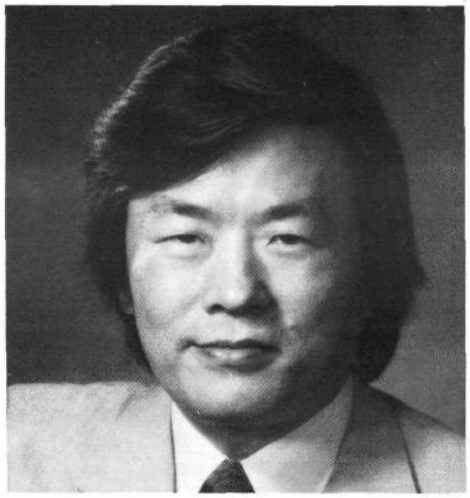
Leder was on the NIH campus for almost 20 years, working for three institutes. He began his career here in 1962 as a research associate in the then National Heart Institute. After three years at NHI he spent a year studying in Israel. Upon his return in 1966 he joined NCI for three years. From 1968 until 1981, he was at NICHD. He left that institute as chief of the Laboratory of Molecular Genetics and went to Harvard, where he remains.

He studied the rearrangements of genes that direct antibody production and discovered a number of specific ways in which the subunits of antibody genes are assembled, and how separate pieces of DNA are involved. He also showed how some cancers can be caused by molecular mistakes that occur when DNA is reshuffled.

In his earlier work, Leder cloned the gene for globin, a substance in red blood cells. He also was instrumental in developing recombinant DNA techniques that have been widely applied.



Dr. Philip Leder

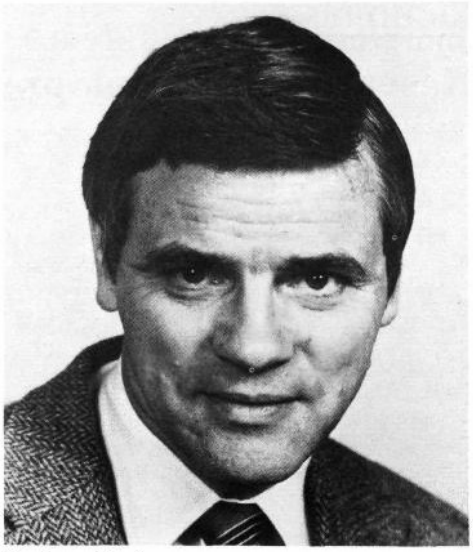


Dr. Susumu Tonegawa

Hood has held grants at NIH since 1963, mainly with NIAID, but also with NIGMS and NCI. From 1967 to 1970 he was on campus as a senior investigator in NCI's Immunology Branch.

He performed detailed studies of antibodies, and showed that portions of them vary biochemically and must, therefore, be programmed by at least three genes. He analyzed and defined in detail how parts of the DNA are reorganized to produce new types of antibodies to recognize an immense variety of substances that are foreign to the body. He also discovered and defined other subtle mechanisms that enable the body to produce as many different kinds of antibodies as it needs.

This is the 42nd year that Lasker awards have been presented. Forty-four Lasker winners have later won the Nobel Prize. One hundred



Dr. Leroy Hood

and twenty-eight of the winners have enjoyed NIH support; three of that number are two-time winners.

Each Lasker award includes a $15,000 honorarium. Leder, Hood and Tonegawa will share the honorarium in basic medical research. □

The NIH Record

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Sharpless, After 51 Years, Continues To Work at NIH

Not many employees remember, much less worked at NIH's 25th and E St. location in Washington, D.C. Dr. Norman E. Sharpless does—he worked at the Division of Industrial Hygiene, starting in November 1936. This division, a branch of the Public Health Service, was absorbed into NIH in 1938 as the Laboratory of Industrial Hygiene.

Sharpless, a physical chemist for NIDDK, was hired initially as a lab apprentice to work on the toxicology of lead and arsenic in insecticides. According to Sharpless, his grade was about a "GS minus 2."

During World War II, he worked on numerous studies relating to the war effort including research on molybdenum and other alloying metals that workers were exposed to in industry. Later he switched from inorganic toxicology to organic toxicology studying DDT and other chlorinated hydrocarbons.

By working in the lab during the day and attending night classes, Sharpless obtained his B.S. degree in 1943 from George Washington University. He received a predoctoral fellowship, and received his Ph.D. from the University of Maryland.

Returning to NIH he worked on numerous

Dr. Norman E. Sharpless

projects—high energy radiation, ultraviolet and infrared spectroscopy and photochemistry. By the end of the sixties he became interested in the visual pigments, as well as drug effectiveness.

With the age of computers, he acquired the necessary knowledge to switch from bench chemistry to theoretical calculations in molecular modeling and quantum mechanics, and to utilize the data in the interpretation of drug actions.

At 71 years of age, he comes to work every day. Recently, Sharpless has been studying the inhibition of the enzyme that is implicated in diabetic cataracts, with the National Eye Institute. "We now have clues useful in understanding the inhibition of the enzyme," he says.

At present he is also studying anti-AIDS drugs by computer modeling and molecular orbital calculations. He has done some work on tricyclic antidepressants.

His hobbies include reading and photography. He and his wife were members of the first NIH square dancing group when dances were held in Wilson Hall.

Recently the Sharpless' gave up their sailboat and are now tracing their ancestors. "I was born in Washington, D.C., the third generation, and my grandmother's family comes from Frederick County, Md.," he said.

For many years he was associated with the NIH Credit Union both on the credit committee and the board of directors, where he served as secretary and as treasurer. □

CFC Campaign Begins on Oct. 21 at NIH

The campaign theme of the 1988 Combined Federal Campaign is "Someone Out There Needs Someone Like You."

The CFC kickoff at NIH is scheduled to begin at noon on Wednesday, Oct. 21. It will be followed by a 3-mile run and 1-mile walk. Registration deadline is Oct. 16 and forms may be picked up at any NIH R&W store.

Anyone is eligible to win the door prizes. First prize is a VCR; second prize is tickets to Roth's movie theaters; third prize is a $25 Safeway stores gift certificate. Additional prizes will be announced at the kickoff. All door prizes are contributed compliments of the R&W Association.

NIH CFC coordinator this year is Stephen Ficca, NHLBI executive officer.

The 1988 goal for CFC is $23 million. This total is distributed among more than 600 agencies from Easter Seals to the Friends of the Clinical Center, which supports the Patient Emergency Fund. Employees can designate any of these (and other) organizations to receive their donations.

It takes all of us to make CFC work! With the CFC banner are (l to r): 1988 NIH CFC campaign coordinator Stephen Ficca, NHLBI executive officer; DHHS Under Secretary Don Newman; Lori Garey, student intern, R&W Association; Randy Schools, general manager, R&W; and Clinical Center patient Danny Martin.

Creeks
(Continued from Page 1)

from detergents used to wash clothes and cars.

Neither NIH stream is spring-fed, Rodenbeck said. Both originate off-campus in environs over which NIH has no control. While the water crosses our campus, it is controlled, he said. Staff of the power plant, grounds maintenance and security conduct periodic rounds to monitor the creeks' condition.

"Laundry drains (from Bldg. 13) do not go into the creek," asserts Cook, adding that the drains are checked periodically to assure that they are not the cause of occasional milkiness seen in stream water.

According to Rodenbeck, the only thing NIH deliberately adds to the streams is "cooling tower blow-down," which is nothing more than tap water used to cool hot air conditioning machinery. The Environmental Protection Agency permits NIH to do this.

When pollution does appear, it can be the result of employees who don't follow proper procedures, he said.

"Pollution is basically a people problem," Rodenbeck explained. Sometimes those who wash NIH trucks fail to empty detergent pails properly. Non-NIH'ers have been known to pull their cars on campus to drain crankcase oil into NIH storm drains, he said.

"We have made a very substantial planning effort for emergency response if oil or chemicals are spilled at NIH," he stated.

Twice a year, NIH conducts drills to test its "Spill Containment and Countermeasure Plan," which covers not only this campus, but also the NIH Animal Center in Poolesville and the Federal Bldg. on Wisconsin Ave.

"An oil-spill drill was held in August," Rodenbeck reported. "NIH has equipment on hand—skimmers, booms, absorbent material—for spills resulting from car leaks, traffic accidents, refueling leaks, generator leaks, etc."

Recently constructed were "containment dikes" near the oil tanks outside Bldg. 11. When oil tanker trucks offload, they rest within the bounds of a dike system that can hold several thousand gallons of oil.

Also built recently was an oil-catch basin adjacent to where the NIH Stream emerges from the ground under the intersection of Center and South Drives. This basin catches all storm runoff from the southwest side of campus. Water enters the basin and swirls around with its load of floating trash and oil, which are skimmed off once a week. A pipe at the bottom of the basin allows skimmed water to continue on its northeasterly way to eventual exit under Rockville Pike at Cedar Lane. From there it flows to Rock Creek, the Potomac River, the

(Continued on Page 5)

A tree provides shade at the confluence of the NIH Stream (l) and the culvert that runs parallel to Cedar Ln. Bldg. 31C can be seen in the background. Pieces of slate form the sides and bottom of the Cedar Ln. culvert, a quiet waterway that makes an attractive place for a noontime stroll.

A Tale of Two Creeks

Two creeks containing storm water runoff cross the NIH campus. One is called the NIH Stream and the other is Stream G.

The NIH Stream emerges from the ground through a wide concrete aqueduct near Bldg. 21 and runs through a wooded valley roughly parallel to Rockville Pike. It meets a Cedar Lane stream at the northeast corner of campus near parking lot 31G and continues under Rockville Pike through an aqueduct dated 1957.

The first glimpse of the NIH Stream may be gained by looking down through the storm drain located at the northeast corner of parking lot 12A. At the bottom of a 20-foot shaft you may observe twin streams feeding in from, roughly, the directions of Stone House and the Clinical Center.

As it emerges from the ground, the stream is diverted into a concrete oil-catch basin. The day the *Record* visited, the basin was a cauldron of swirling, greasy brown-green soup flecked with tennis balls, soda cans and a half-submerged bag of Doritos. Also in the maelstrom were a soggy egg carton, a bird feather, and Styrofoam cups.

Ten feet further north, the stream was virtually clear, having been purged of its effluvia by the oil-catch basin.

As we followed it further, a duck paddled fearlessly into view and posed for a series of photographs.

Further on we encountered a green rubber glove, a car muffler and a can of Schlitz malt liquor that had become inextricably woven into a tangle of creek-side tree roots.

The creek bed at many points has been bolstered by chunks of concrete and asphalt, some with spines of steel rebar still poking out. The NIH Stream babbles gracefully over such hindrances, passing a man who has prostrated himself on a blanket at the foot of a generous willow. Beside him is a tea kettle and picnic lunch. Underneath his head a pair of loafers forms a crude pillow; across his brow a lunch bag offers shade.

Before we reached the boundaries of NIH property, our inventory of stream-side curiosities included a submerged "No Parking" sign; a can of Carb-Medic carburetor, choke and valve cleaner; an 8 oz. plastic bottle of Keson Ultra Fine Marking Chalk; a New Balance running shoe for the right foot, complete with laces; furls of plastic police tape; plumbing fixtures; soda and beer cans and bottles; Styrofoam cups by the dozen and a blizzard of Styrofoam packing chips. All of which bolstered an assertion made by Sven Rodenbeck of DS: "Whatever litter gets tossed on the campus eventually ends up in the creek."

The *Record* did not investigate the course of Stream G, which enters campus from a large pipe behind the National Library of Medicine then continues along NLM's south lawn in an easterly direction before passing beneath the Pike.

Halfway through its brief journey across campus, Stream G has been diverted and buried by road crews building the Woodmont Ave. extension.

Regardless of civilization's encroachment, a family of ducks has been seen nesting peacefully on the banks of Stream G. That, at least, seems a healthy sign for NIH's waterways.

(Continued from Page 4)

Chesapeake Bay and the Atlantic Ocean.

Before accomplishing that remarkable journey, however, the creek enjoys a picturesque run through a valley near Bldg. 21. Tom Cook has taken pains to preserve this stretch of the creek, which is home to mallard ducks that have raised families there.

"We have rerouted the creek before to align it with bridges," Cook said. "But I don't want to see the creek piped (buried underground) near Bldg. 21."

Cook said that, since 1960, the sides of the creeks have been regraded at least three times. "We have also planted willow trees so their roots would prevent the banks from eroding," he said.

Erosion has been a continual problem for NIH creeks, he added. "The bottoms are silty, not firm. If you tried to take a tractor down there it would sink to its axles in a minute. We have dumped stone and riprap to firm up the bottom."

Blame for pollution in the stream must be shared by NIH's neighbors, declares Cook, who says he notices suds in the water "every once in a while." He also notices goldfish.

"The Navy pond (across Rockville Pike) has goldfish in it," he said. "The fish leak into

Riprap—broken pieces of concrete and stone—help firm up the bed of the NIH Stream as it courses past Bldg. 21 on its way to Rock Creek.

NIH when Navy cleans the pond."

Dene Zierdt has seen the goldfish. And the ducks, one of which had eight ducklings this year.

"I get nothing but positive reaction from my coworkers when I mention our pollution and trash problems," she says. "I haven't met one person who wasn't concerned."

She suggests more trash bins around the creek, and "nice, discreet signs" advising against littering. Her strongest recommenda-

tion is to fine those caught littering. "They have fines for parking and driving—why not for litter?"

Concludes Zierdt, whose husband sometimes accompanies her on impromptu trash collection missions near the streams: "We ought to be more responsible."—**Rich McManus** □

October STEP Forum

A STEP forum called "The Effective Manager: Collaborating with the Personnel Office" will present ideas on how to improve productivity and morale through the use of existing personnel mechanisms. It will be held Oct. 21 from 1:30 to 4 p.m. in Wilson Hall, Bldg. 1.

Overviews of the system and how to use it to motivate and recognize employees will be featured. Subjects include the performance appraisal system (Ronald Sleyo, NIDDK); using the federal appointment system in recruiting and staffing (Sheila Johnson, Clinical Center); strategies for classification and promoting employees (Kathleen Meloan, NCI); and using the awards system to enhance productivity and morale (Judy Vickers, Recruiting and Employee Benefits Branch, Office of the Director).

Dr. Charles R. MacKay, director of the Division of Program Development and Evaluation, OPRR, OER, will chair the forum.

Ample time will be provided for questions and answers following the presentations. No preregistration is required for the forum, which is open to all professionals, scientific and support personnel. Additional information is available from the STEP program office, Bldg. 31, Rm. 1B63, 496-1493. □

Seminar Forecasts 'Second Century'

During this Centennial year, much has been written and said about the past and present research accomplishments of NIH scientists and grantees. To round out this picture, the future progress that can be expected in three areas of biomedical research will be presented at the NIH Centennial Science Writers Seminar entitled "The Second Hundred Years." Dr. Joseph E. Rall, NIH deputy director for intramural research, will moderate the seminar on Thursday, Oct. 15, from 9 a.m. until noon in the conference room of the Mary Woodard Lasker Center for Health Research and Education (formerly the convent).

Dr. Solomon H. Snyder, director of the department of neuroscience and distinguished service professor of neuroscience, pharmacology, and psychiatry at Johns Hopkins School of Medicine, will describe new horizons in molecular neuroscience. Snyder was here at NIH in NIMH's intramural program before he moved to Baltimore. He is a grantee of NIMH.

Understanding the human genome and what we can expect to gain from such knowledge will be discussed by Dr. Maxine Singer. Formerly chief of NCI's Laboratory of Biochemistry, she is currently on sabbatical as a senior investigator in that lab.

Dr. Philip Leder will forecast what we can expect from genetics, medicine's newest tool. Leder spent almost 20 years as an NIH intramural scientist, most of this time as chief of NICHD's Laboratory of Molecular Genetics. Since 1981, he has been John Emory Andrus professor of genetics and chairman of the department of genetics at Harvard Medical School.

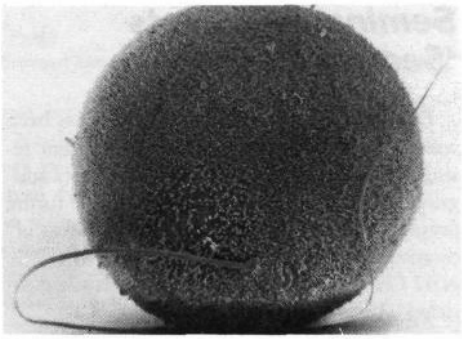
This Centennial event is sponsored by the Division of Public Information, OD. Priority seating will be given to members of the press. To preregister, call Bobbi Bennett, 496-1766. □

Seminar on MLAB

The DCRT Training Unit is sponsoring an informal seminar on MLAB on Oct. 16, from 9 to 11 a.m. in Bldg. 12A, Rm. B51.

MLAB is an interactive language for experimentation and evaluation of mathematical models. It includes a wide variety of computational tools, including curve-fitting and graphical capabilities. MLAB was developed at NIH and has been in use here for more than 15 years.

To register for this seminar, please contact the DCRT Training Unit, 496-2339 or TDD 496-8294. No registration form is required. □



Electronmicrograph of rabbit egg and sperm.

By following the series of photos that accompany this story, readers can trace human development in progressive stages beginning with egg fertilization, infancy (shown here) and then . . .

. . . the first tentative steps. . .

NICHD

(Continued from Page 1)

of pediatrics. He was named director in February 1986. Herewith he shares some of his thoughts on the present and his vision for the future of human development research.

With the institute's broad range of research, is there one theme that holds it all together?

If there is a single theme it's one of "healthy development," and that's all-pervasive. It covers physical, mental, social, behavioral, and environmental health. Under environmental health I include population issues—helping people to have only as many children as they want; working toward a world that is not overpopulated or depleted of resources.

What are some of the most important issues confronting the NICHD?

I consider overpopulation to be one of the greatest threats to the planet. Much of our research focuses on allowing people to have children when they want them; to avoid unwanted pregnancy. We actually address both sides of the population issue, because we also work to help those who have difficulty having children.

The other major issue is the well-being of the next generation and the next generation and the next generation. That really holds the key to everything. We want to help people to have healthy children who can reach their full potential. The future of our nation doesn't hinge on anything so much as the people we produce. We want the next generation to be as healthy and productive as possible.

How does the institute's mission fit in with future health and productivity for individuals and the nation?

To the extent that we're successful in accomplishing the goals of human development research, we improve the health of our people, their happiness, and our productivity as a nation. These goals are many.

The children of the next generation have to be not so great in number that we don't have jobs or food or social resources for them. They have to be as free as possible from birth defects or injuries, and protected against acquired handicap from accidents or illness.

They have to be able to grow up in a nurturing environment so that their social and behavioral development is as good as it can possibly be. We need to know how to provide that—what fosters that kind of growth and development in social, behavioral, and intellectual realms?

They also need to be free of mental retardation and able to reach their full intellectual ability. We need to help them to learn as effectively as possible, and to cope with any learning disabilities.

. . . anticipating arrival of a sibling. . .

We need to encourage them into healthy lifestyles and away from the kinds of things we know will handicap them as adults, physically and mentally. That means avoiding high-risk behaviors—smoking, alcohol and drug abuse, unhealthy diets—plus taking care of themselves physically—exercise, regular health care, and other healthy behaviors.

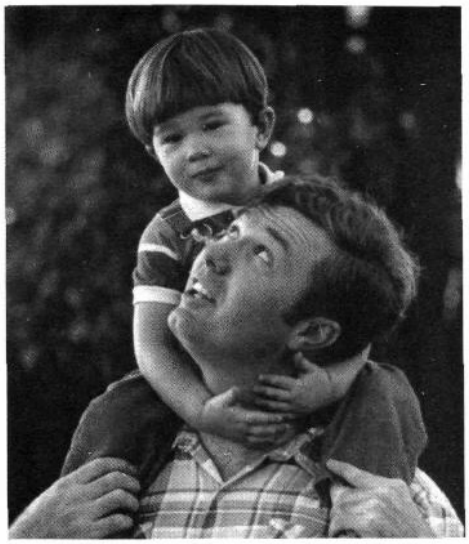
Most of these characteristics are determined in childhood. So the the greatest opportunity we have for making a beneficial, lasting impression from any intervention is with children. We need to learn how to do this best. And, in turn, how to make them good parents that will help to make the next generation even better.

What is the role of human development research in population growth?

Part of it is biological. It's increasing our fundamental knowledge of human reproductive processes and applying that knowledge to contraception. Last year, for example, our grantees isolated a long-sought natural substance called inhibin, which can stop production of sperm and eggs without affecting libido. They determined its chemical structure, and now we're working with it as a potential contraceptive.

We also help to improve the safety of existing birth control methods. Our large-scale evaluations of the pill, for example, have shown which products are best for which women, and have helped in the design of new, safer products.

The behavioral side is important, too. In the United States, although we have good contraceptives, 52 percent of pregnancies are unintended. And teenage pregnancy is a special problem that requires our attention. Either



. . . riding high. . .

people are not doing a good job of using contraceptives, or are not motivated enough to care. We need to learn how to get people to adopt and use successfully the methods of contraception we have.

As the institute has grown in its 25 years, how has it changed?

If there's been a change, it's been toward a more activist philosophy on the part of the institute, toward an increased focus on intervention and prevention. Our earliest years were spent more on basic processes, studying normal development. These were key words—the study of normal development will teach us how to deal with abnormal development.

We have learned a lot and it's now starting to pay off as we develop and test means of intervention. For example, we now have networks of medical centers working on the problem of low birth weight. Low birth weight is this country's main problem in maternal and child health. It has implications across the board—low birth weight babies are more prone to dying and to have lifelong handicaps, both physical and mental.

Now we're designing and testing interventions aimed at preventing low birth weight and infant mortality. And we're developing ways of treating low birth weight infants to enhance their survival. A prime example is human surfactant, a lung lubricant. Our grantees discovered that when surfactant is administered within a few seconds after birth, it reduces the incidence and severity of breathing problems in premature newborns. It has the potential to save most of the 8,000 premature infants who die from respiratory distress syndrome in the United States each year.

We've also become more activist in the area of mental retardation. Over the years, we've increased our ability to prevent mental retardation. Each year, screening tests and treatments prevent 250 cases of mental retardation from phenylketonuria and 1,000 cases from congenital hypothyroidism. Treatment with RhoGam for Rh disease, or maternal-fetal blood incompatibility, prevents several thousand cases of mental retardation per year, and the measles vaccine another 3,000.

Now the leading cause of acquired mental retardation is meningitis caused by a type of bacteria, *H. influenzae type B*, or HIB. It causes an estimated 4,000 cases of mental retardation each year. Our intramural scientists in Dr. John Robbins' lab have developed a new HIB vaccine, the first to work in infants. We are now conducting the clinical trials necessary to have it approved and marketed. With this vaccine, we hope to eliminate HIB as a cause of mental retardation.

Although our birth defects research is in the basic stage, we're starting to get some breakthroughs. Our intramural scientists in the lab of Dr. Igor Dawid are at work on the genes that control the earliest phases of development; what turns them on and off; and how that process may go awry to cause birth defects.

Where is the excitement in human development research today?

There are two major areas where I think the greatest needs and opportunities exist for this research. The first is the enormous opportunity that the new tools of molecular biology have provided for studying all phases of human development. The second is the incredibly rapid pace of change in society today that demands biobehavioral research in human development. To me this combination makes human development research the most interesting and exciting place to be these days.

The new tools of biological science are enabling us to address at last some of the basic questions of biology and human development. Most fundamental of all is the question of how a fertilized egg differentiates into an organism in the likeness of its parents. Here scientists are using recombinant DNA, molecular biology techniques, and animal models like the fruit fly, the frog, and the sea urchin to study the earliest events as genes turn on and off to control and direct development after fertilization.

This research also is giving us clues to what can go wrong in the normal process of development and can lead to birth defects. A 1986 Nobel Prize was awarded to Dr. Stanley Cohen, one of our long-term grantees, for his research demonstrating the role of growth factors in normal growth and their links to abnormal growth and development as well.

We are getting closer to learning how we and other higher animals survive in a world of hostile microorganisms. One of our most exciting discoveries in recent years was made by our intramural scientist Dr. Michael Zasloff, whose research in frogs led him to uncover a new class

(Continued on Page 8)

. . . enjoying friendships of youth. . .

(Continued from Page 7)

. . . *preadolescence. . .*

of natural antibiotics called magainins, which have broad implications for human health.

We're learning more about how the immune system develops and how to enhance its protective function with new vaccines. In the same laboratory where the new HIB vaccine was developed, Dr. Ron Sekura and his colleagues are creating a new pertussis vaccine that promises to be both safer and more effective than the current vaccine.

We're discovering new things about the development of the brain and nervous system. We now know that new growth of nerve cells is possible, contrary to our old thinking. We're also learning more about brain-behavior relationships and about the influence of genetics on behavior.

We're heading toward the ultimate accomplishment in the new genetics: gene therapy for genetic developmental defects. Our scientists have isolated and cloned genes for many conditions that cause mental retardation and other disabilities. They have inserted these genes into cells and had them function in tissue culture and in some animal models. We really think we're going to get there, perhaps within the next 5 years, and will actually be able to succeed in this effort toward gene replacement therapy. We've narrowed down the cause of Down syndrome from the whole extra chromosome 21 to one band on one arm, and probably just a few genes within that band. We're intensively mapping that band to find out what genes are in it and which specific ones are responsible for Down syndrome. And when we learn exactly what they are, the disorder may be treatable or correctable.

All of these studies illustrate how the new techniques of molecular biology are being applied in exciting ways to problems of human development.

What about social research in human development?

That is another area of great opportunity, and it is necessitated by rapid changes in our society, particularly in the family. Never have such great changes occurred in the family in so short a time. Twenty years ago, one-fourth of marriages ended in divorce; today it's one-half. If current trends continue, more than 50 percent of white children and more than 90 percent of black children will spend part of their lives in a single-parent household by the time they are 18. If indeed the family is as important as we have always thought it is for child development and for society, it's essential that we learn the impact of this enormous change and, if necessary, how to modulate any adverse effects.

Very closely related to changes in family structure are changes in maternal employment. Once again, a big change has occurred in a short time, just the last 15 years, primarily. In 1975, one-third of mothers of children under age three were working. In 1985, it was over one-half and headed for two-thirds by 1995. Why are they working? In large part because only one job in four now has a salary adequate to provide for a family of four. There are two key questions here for human development researchers: First, the impact on the child of the mother working and second, the quality and the effect of their child care placement.

What are the main contributions that behavioral research can make to health?

With changes in sanitation and the control of infectious diseases, we have reached the point in the United States where 6 of the leading 10 causes of death are related to behavior. Most are related to smoking, to alcohol, to diet, or to injury. It has been said that the mouth is the most dangerous part of the body. Smoking alone kills the equivalent of the crash of four 747 airliners a day. Alcohol abuse causes one-fourth of hospitalizations in young and middle-age adults and half of all traffic fatalities. We are discovering more and more about the effects of diet and exercise on health. This is a fertile area for human development research. How can we modify behavior to improve health, beginning with children but including adults as well?

What is the role of human development research in battling AIDS?

Vaccine and drug work are important, but work on human development and behavior is also essential. We need to learn more about the development of the immune system. We also need to study the developmental impact of the virus on children who are infected but do not develop the active disease.

We also need to improve our understanding of the behavior of people in their reactions to AIDS victims, and how it may be modified to

. . . *the teenage years. . .*

. . . and, finally, the creation of a succeeding generation.

reflect reason rather than emotion. We need to update our knowledge of sexual behavior in American adults, which is important in order to understand the transmission of the disease and how to target our intervention efforts. We need to learn how and at what age to teach children about AIDS, about its sexual transmission and how to prevent that. We need to learn how to reach adults more effectively and change their sexual and drug-use behaviors to prevent AIDS transmission.

What about the other end of human development, the "graying of America"—does the institute's work have impact there as well?

Many of the health problems in the later years are a consequence of lifestyle and health behaviors, or of disease processes, that began in childhood. The more successful we are preventing or delaying the beginning of these processes, and in encouraging children to adopt healthy lifestyles as a lifelong habit, the healthier, happier, and more productive that "graying population" will be.—**Maureen Gardner**

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ANNIVERSARY
National Institute of Child Health and Human Development

Women's Health Seminar

"Women's Health: Taking Charge," a seminar on women's health issues, will be held in the Clinical Center, Masur Adutorium, on Friday, Oct. 23 from 9 a.m. to 1 p.m.

Renee Poussaint, WJLA news anchor, will open the session and moderate the panel discussions. Dr. Ruth Kirschstein, director, NIGMS, will set the stage for the program with a talk on advances in women's health during the past 100 years.

The panelists, experts from around the country, will discuss "How to Talk With Your Doctor," A Threat to Health: Addictive Behavior," "Nutrition, Energy, Exercise," "Controlling and Combatting Risks of Common Diseases," and other topics. There will be question and answer periods.

NIH employees and the general public are invited to attend. Sign language interpretation will be provided. The seminar is an NIH Centennial event sponsored by the NIH Advisory Committee on Women's Health Issues, with the NIH Federal Women's Program, Division of Equal Opportunity. □

Stone House Symposium

A symposium on "Biochemical Mechanisms in GTP Mediated Protein Interactions" will be held at the Stone House from Monday, Oct. 19, through Wednesday, Oct. 21.

Preregistration is requested. For more information, contact Nancy Shapiro, Fogarty International Center, 496-2517. □

Conference To Discuss Effects of Acid Rain

Acid rain and other forms of acid precipitation are associated with dying forests, lifeless lakes, and stone buildings and sculptures dissolved by acid carried in the atmosphere. But environmental scientists are also investigating the health effects of acid aerosols on the public.

The National Institute of Environmental Health Sciences in Research Triangle Park, N.C. will host an international conference cosponsored by the institute and the U.S. Environmental Protection Agency, Oct. 19 through 21, at NIEHS' Bldg. 101.

The chairman of the October conference will be Dr. Morton Lippmann, professor of environmental medicine at New York University.

Sessions will be devoted to scientific papers on epidemiology, toxicology and exposure studies, and will include reports on research in the U.S., southern Ontario, London, the Netherlands and elsewhere in both Western and Eastern Europe.

"Knowledge about the health dimensions of the acid precipitation phenomenon are central to forming the comprehensive data base upon which a wise response to the problem can be initiated," Dr. David P. Rall, director, NIEHS, said.

This is the second conference on the health effects of acid precipitation jointly sponsored by the two federal agencies; the first, in 1984, was also held at NIEHS.

There is no fee for conference registration, but attendance will be limited by seating availability. Those interested in more information or in registering should contact Janet Riley, Mail Drop B2–01, NIEHS, P.O. Box 12233, Research Triangle Park, NC 27709, (919) 541-7621, or FTS 629-7621. □

Symposium on Military Medicine

The 5th Annual Military Health Professionals Symposium, sponsored by the U.S. Army Reserve, will be held on Oct. 24 and 25 in Masur Auditorium. This year's topic will be "Cardiovascular Issues in Military Medicine."

NIH staffers are invited to attend. For more information and reservations, call Mary Roberts, 593-9595. □

Computer Exhibit Open House

More than 12 companies will be showing advanced graphics and office automation products in Bldg. 1, Wilson Hall on Oct. 7 from 9:30 a.m. to 2:30 p.m.

All personnel are invited. No registration is required and complimentary refreshments will be served. □

NIH Receives Ph.D. Data For Policy Studies

In addition to basic and clinical biomedical research, the NIH conducts research about researchers, their education and professional development. A data resource was recently acquired by the NIH that will aid in policy studies to guide scientific workforce development programs.

All Ph.D.'s awarded in the United States since 1922—more than 1,200,000 individuals—are named in the computer file now being shared by the National Academy of Sciences, NIH and other federal sponsors. The

Accepting an important computer file on behalf of NIH is Dr. Charles R. Sherman (l) of the Office of Program Planning and Evaluation. Representing federal agencies that collaborated in creating the data are Herman G. Fleming, privacy act coordinator for the National Science Foundation and Susan Coyle of the National Academy of Sciences.

NIH continues to provide, through the National Science Foundation, a share of the support for the addition to the file of some 31,000 new degree recipients annually. Legal safeguards protect the privacy of persons named in the file.

The new data resource, known as the doctorate records file (DRF), is one of several databases available through the Office of Program Planning and Evaluation for evaluative purposes.

Among the first studies at NIH that will make use of DRF records will be several looking at the progress of current programs and continued prospects to enhance minority participation in NIH research and scientific review. □

Lecture on Stress

The focus of the 1987–88 Employee Counseling Services' Guest Lecture Series is managing stress. The first lecture, "From Panic to Power," will be presented Wednesday, Oct. 14, from noon to 1 p.m. in Bldg. 31, Conf. Rm. 10, C Wing. □

NIH Director Dr. James Wyngaarden is the recipient of the Juvenile Diabetes Foundation's Richard Schweiker "Excellence in Government Award" for 1987. Presenting him with the award are Eileen Gelick (l), past president of JDF, and Joan Beaubaire, JDF president. The JDF is the major voluntary organization for people with Type I diabetes.

AIDS Therapy Research Funded by NIAID

NIAID is awarding $10 million for cooperative agreements among academia, industry and government for research to discover new therapies for AIDS. The money will fund 11 new National Cooperative Drug Discovery Groups.

Dr. Anthony Fauci, director, NIAID, says the agreements differ from both grants and contracts, which have been more commonly used mechanisms for government funding of scientific research.

Investigators exploit leads from basic studies in virology, immunology, molecular biology, protein chemistry, organic chemistry, x-ray crystallography, medical chemistry, and pharmacology and NIAID will assist in facilitating their research efforts.

At present, only one antiviral drug, AZT, is licensed for the treatment of AIDS, and it is not regarded as a cure. Several other experimental drugs are now undergoing clinical trials at NIAID's 19 treatment evaluation units and at the Clinical Center. □

Blue Pencil Awards

Two NIH offices have been awarded 1987 Blue Pencil Competition awards for editorial excellence by the National Association of Government Communicators.

NIGMS was awarded First Place in the Publication for General Audience (Two or Three Color) Category for "Then & Now: Biomedical Science in 1887 & Today."

NLM was awarded Honorable Mention in the Miscellaneous Group (Maps, Logos, Business Cards and Pocket Folders) of the Visual Design Category for "Grateful Med—User's Guide."

The awards will be presented at a banquet at the NAGC conference on Nov. 19. □

Roach Fastest 'Angel' In 10-Mile Run

The best weather of the year greeted the 91 runners who turned out Sunday, Sept. 27, for the 12th annual running of the NIH Health's Angels race now known as the "Al Lewis 10-Mile Run" in memory of the late club president. Once again the race along the bike path in Rock Creek Park was recognized as the 10-miler in the D.C. Road Runner's Club Championship Series.

The overall winners were 25-year-old Jerry Sweeney of Rockville in 55:08 and Geri Yorke in 74:27 in the men's and women's divisions, respectively.

Tom Roach took the trophy for fastest NIH runner, and *NIH Record* editor Rich McManus captured the Unbody Award; Roach finished in 64:18 and McManus in 79:39. To qualify for the Unbody Award, a Health's Angels tradition introduced by Al Lewis 12 years ago, a runner's weight (lbs) must equal or exceed 2.5 times his height (inches). This award, although sounding somewhat frivolous, addresses a serious purpose and is intended to encourage participation of runners with mesomorphic builds.

Medals were awarded to the top three finishers in each of six age groups, and ribbons were presented to all finishers. The 10-Mile Run was preceded by a 1-miler for children age 10 and under, and by a 2-mile "Run For Your Life."

Race organizers expressed their disappointment with this year's turnout, especially among NIH runners, and are considering innovative approaches to attract more local NIH interest for next year's race.—Dick Henneberry □

Free Clinic Needs Physicians

The Washington Free Clinic, the oldest alternative health care center in the Washington area, is seeking volunteer physicians to staff its clinic in northwest Washington.

For more information, call Sharon Zalewski, 667-1106. □

Normal Volunteers Needed

Men, ages 27–35, and women, ages 20–60, with 4 years of college or less are needed to participate in neuropsychological research at NIMH. Volunteers will be paid for their time. Requires one to three 2- to 4-hour sessions of testing. No painful procedures are employed; only EEG scalp electrodes are applied.

If interested call Diana Carson, 496-7674 between 9:30 a.m. and 2 p.m., Monday through Friday. □

TRAINING TIPS

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

Courses And Programs	Dates
Management and Supervisory 496-6371	
Working with Personal Differences	10/21–22
Managing Behavior in the Work Environment	10/28–30
Practical Management Approaches	10/15–16
MBTI II	12/8–9
Why Can't They Hear Me?	11/18–19
Using Animals in Intramural Research	10/29
	11/19
	12/17
Pragmatic Problem Solving	10/5
	12/2
Networking	10/8
Office Skills 496-6211	
Secretarial Excellence & Clear Communications	10/18
Proofreading and Editing	10/19
Computer Literacy for Support Staff	10/5
Medical Terminology I	10/20

Adult Education 496-6211

Training and Development Services Program 496-6211

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Odle Sets Example For Coworkers

By Francis X. Mahaney, Jr.

The morning sun highlights the young woman's hair as she smiles and greets an office worker with an exuberant "H-e-l-l-o." In quick, graceful movements, her fingers speak sentences that cut across the barriers of silence.

Barbara Odle is deaf and has cerebral palsy, but she does not let these conditions prevent her from working as a clerk typist for the Contracts Review Branch of the National Cancer Institute. At home, she paints watercolors, creates intricate needlepoint, and writes science fiction.

Odle can hear only the faintest of sounds. When cars move across a busy road, for example, they "whisper" to her. The subtlety, beauty and intonation of human language and music are lost. Nevertheless, she is a communicator. She hammers words out on her IBM computer or spells them out in the articulate gestures of sign language.

Her dream is to be an NIH public information specialist for the hearing impaired and those with other communication disorders.

"I want to show the hearing impaired that they can succeed too," she says.

Recently, Odle's coworkers decided to learn sign language and now a group of them meet at lunchtime to learn from her.

Dr. David Joftes, who recognized her abilities and hired her, says Odle is a perfect example of a handicapped person making an excellent contribution to an organization.

Barbara Odle

"No one has done her any favors. She has earned her place in our branch by her competence and delightful personality," he says. "I hope this example will stimulate others at NIH to develop positions for handicapped people in their units."

Doctors first recognized Odle's hearing loss and cerebral palsy when she was 2 years old.

Over the years she has learned to overcome her problems with physical therapy, exercise, and determination. □

Dr. Lewis Thomas, president emeritus of Memorial Sloan-Kettering Cancer Center, recently addressed "The Hard Science of Aging" at NIA's first Florence Mahoney Lecture on Aging, held recently in the ACRF Amphitheater. Among topics Thomas discussed were changes that occur in the human mind over time and patterns of thought.

Hepatitis Patients Needed for Study at Clinical Center

Scientists at NIH are conducting a treatment study with alpha interferon for patients with non-A, non-B hepatitis following a blood transfusion.

To qualify for this study, patients should:

- be between 18 and 70 years old;
- have had hepatitis for longer than 1 year, following a blood transfusion within the last 5 years;
- have no other serious illness; and
- live in the Washington or Baltimore metropolitan areas.

Eligible patients will be screened to determine if they can be helped by this study. Some patients may receive a placebo initially, but all paticipants will eventually receive alpha interferon, a promising experimental treatment for hepatitis.

The study, which will continue for 1 year, is taking place at the Clinical Center. Patients participating in this program will receive their treatment and followup visits at no charge. *The deadline for admitting new patients is Nov. 30.*

For more information, contact NIDDK, 496-3583. □

Barbara A. Weldon, a writer with NIAMS, received the "In Appreciation Award" from the Lupus Foundation of America at its recent annual meeting in Chicago. Citing Weldon's work, Foundation President Evie L. G. Dennis, said that this "is our way of recognizing your contributions to creating public understanding of and knowledge about lupus and is an expression of our esteem for you."

AIDS Vaccine Testing Begins at the Clinical Center

By Blair Gately

The first human clinical trial of an experimental AIDS vaccine has begun at the Clinical Center.

Dr. Anthony S. Fauci, director, National Institute of Allergy and Infectious Diseases, says researchers will study the vaccine in 75 homosexual males who have not been exposed to the human immunodeficiency virus, or HIV, the cause of AIDS. In addition, six persons with no history of risk behaviors will participate in the study.

"This is the first step in what will be a long process toward developing a vaccine to prevent AIDS," Fauci said. He predicts it will not be until the mid-1990s that an AIDS vaccine will be approved for general use.

So far, more than 40,000 persons in the United States have been diagnosed with AIDS, and almost 60 percent of them have died.

The vaccine being tested here at NIH is manufactured by MicroGeneSys, Inc. of West Haven, Conn. It consists of the envelope protein derived from the genetic material of HIV. The virus attacks and destroys cells of the immune system, allowing infectious agents to enter the body and cause life-threatening illnesses.

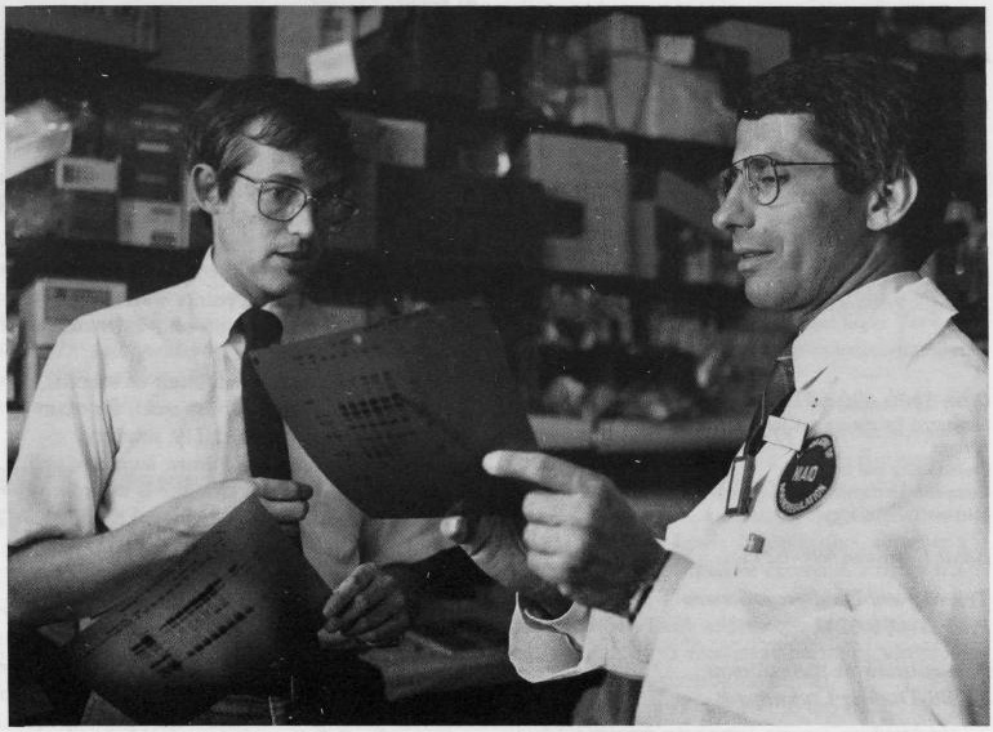
Dr. H. Clifford Lane, deputy clinical director, NIAID, and a senior investigator in the institute's Laboratory of Immunoregulation is carrying out the study. He says the majority of the volunteers are homosexual males since they are the most likely group in the United States to receive an AIDS vaccine.

The volunteers go through "an extensive prescreening process" and are given three lab evaluations and a physical before the vaccine is administered, Lane says. In addition, they are tested twice to make sure they are free of HIV infection and they must agree to observe safe sexual practices while participating in the study.

In theory, the vaccine mechanism would work by taking a portion of the outer coat of the AIDS virus and injecting it into people, hoping their bodies will mistake the vaccine for the virus and causing their immune systems to mount antibody attacks. An antibody positive response would indicate a potentially effective vaccine.

"The vaccine consists of purified protein from HIV and not the virus itself," said Fauci. "Therefore, no one can get AIDS from the vaccine and we expect no adverse effects beyond those that sometimes occur from other immunizations, such as some redness and soreness at the site of the injection."

During the first phase of the testing, which is expected to last about 6 months, the toxicity and side effects of the vaccine will be evaluated, Lane says.



NIAID director and chief of the Laboratory of Immunoregulation, Dr. Anthony S. Fauci (r), and Dr. H. Clifford Lane discuss aspects of the first human AIDS vaccine trial. They are looking at X-ray film results of a Western blot antibody test for AIDS virus infection.

If results are encouraging, the second phase, lasting about 1 year, would involve about 200 volunteers. It is designed not only to explore the safety of the vaccine, but also the immunological response to it and, in addition, to determine proper dosage.

After the success of the second phase is determined, the third phase, involving thousands of volunteers, could begin. It is only after the results of the third phase are analyzed that it can be established whether or not the vaccine has actually prevented AIDS infection.

"This study is a natural outgrowth of the overall goal of NIAID's Laboratory of Immunoregulation, which is to understand the immunopathogenesis of AIDS," Fauci said. "NIAID scientists have been working closely with scientists at MicroGeneSys in developing the vaccine and in assessing its results in animal studies."

To make the vaccine, scientists inserted the modified gene for the entire HIV envelope precursor protein, gp 160, into the genome of a baculovirus, a virus that infects such insects as moths and butterflies. The recombinant virus is grown in a cell tissue culture system, which products the gp 160.

Several other biotechnology companies are working on developing AIDS vaccines, but so far MicroGeneSys is the only one to have received approval from the Food and Drug Administration for human testing. Research is also progressing on development of drugs to treat those already infected with AIDS. □

Milestones in Medicine

A symposium titled "NIH: Milestones in Medicine II" will be held Oct. 15 from 7:30 until 10 p.m. in the ACRF Amphitheater.

Speakers include Dr. Anthony Fauci, director, NIAID; Dr. Sheldon Wolff, Tufts University; Dr. Victoria Harden, curator of the DeWitt Stetten Museum of Medical Research; and Dr. Ramunas Kondratas, Smithsonian Institutions.

The symposium is sponsored by NLM, NIDDK and the Washington Society for the History of Medicine. □

*. . . the welfare and prosperity of all countries and communities, and, . . . individuals, depend upon their morals. . . .—**Abigail Adams** (1778)*