

the NIH Record

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

September 8, 1965
Vol. XVII, No. 18

NATIONAL INSTITUTES OF HEALTH
PUBLIC HEALTH SERVICE

Dr. Hertz Named Scientific Director Of the NICHD

Dr. Roy Hertz has been appointed Scientific Director of the National Institute of Child Health and Human Development, it was announced last week by Dr. James A. Shannon, Director of NIH.

As Scientific Director of the Institute, Dr. Hertz will be responsible for developing the laboratory and clinical research programs here and elsewhere. He will be principal scientific advisor to the Director of the Institute.



Dr. Hertz

Director of the Institute.

Goal Described

The goal of the National Institute of Child Health and Human Development is the study of the whole individual and research into the normal processes of growth and development. One area of major importance will be research related to medical and biological aspects of the population problem.

Throughout his career Dr. Hertz has made significant contributions to the knowledge of ovulation, the physiology of menstruation and pregnancy, and the problems of growth and development. His sci-

(See DR. HERTZ, Page 4)

New Operations Section Established by NIDR

Dr. Francis A. Arnold Jr., Director of the National Institute of Dental Research, recently announced the establishment of a new Operations Section in the Extramural Programs Branch of the Institute.

The new section will provide coordination of extramural operational functions including grants processing, management, analysis and evaluation of program, and general administrative services.

Raymond A. Morrison, a Program Analyst in the Extramural Programs Branch since 1959, has been named Chief of the section.

Study of Squid Axon Advances Nervous System Understanding

By Steven E. Beasley

The squid—a pearly, ten-armed sea animal that swims the world's oceans by jet propulsion—stars in a daily program at NINDB's Laboratory of Biophysics. Because of its giant nerve fiber (axon), the squid has made possible research which has significantly advanced understanding of the nervous system during the past thirty years.

Dr. Mohler Is Appointed Assistant to Dr. Mider

Dr. William C. Mohler of the Laboratory of Chemical Pharmacology, National Cancer Institute, has been appointed Assistant to Dr. G. Burroughs Mider, NIH Director of Laboratories and Clinics.

Dr. Mohler, whose appointment became effective September 1, will assist Dr. Mider with his duties as the principal NIH policy advisor on Intramural programs, including research activities at certain field installations of NIH.



Dr. Mohler

Succeeds Dr. Black

He succeeds Dr. Roger L. Black who has been named an Associate Director of the Clinical Center (see *NIH Record*, Aug. 24).

Dr. Mohler first joined NIH as a Clinical Associate in the Cancer Institute (1955-57). From 1957 to 1959 he was a postdoctoral Fellow in immunology and biochemistry

(See DR. MOHLER, Page 6)

A foot-long creature, the squid belongs to the highest class of mollusks, which includes its cousin, the octopus.

In the squid's long, cigar-shaped body, giant axons carry messages (impulses) which control the animal's rapid intake and outward squirting of water, by which it propels itself in a forward or backward direction.

Fibers Carry Signals

The big nerve fibers function much as those of humans, carrying signals from the brain to the body's muscles and glands.

The squid's giant axon, a single nerve fiber one-fiftieth of an inch thick (about the thickness of a silk thread), can be isolated in 2-inch portions and kept alive in salt water for several hours. Research scientists who work with these axons search for clues to explain how the nerve impulse is conducted.

After firmly clamping the axon

(See SQUID STUDY, Page 6)

Contract for Study Of Family-Planning Goes to Princeton

American family planning practices will be surveyed by Princeton University under terms of a \$377,238 contract from the National Institute of Child Health and Human Development.

The survey, called "The National Fertility Study," will be patterned along the lines of two previous Growth of American Family studies conducted in 1955 and 1960. This study, however, will extend and improve upon information gathered in the earlier surveys.

Data From 6,200

The new study will gather data on family planning practices from a national sample of some 6,200 married women in the 18-54 age group. Data obtained in the survey will supplement the previous studies and will be used as a base of reference for prospective studies on fertility control practices and their influence on the health of women and children.

The study will also prove important because information obtained can serve as a foundation upon which future longitudinal American population studies can be built.

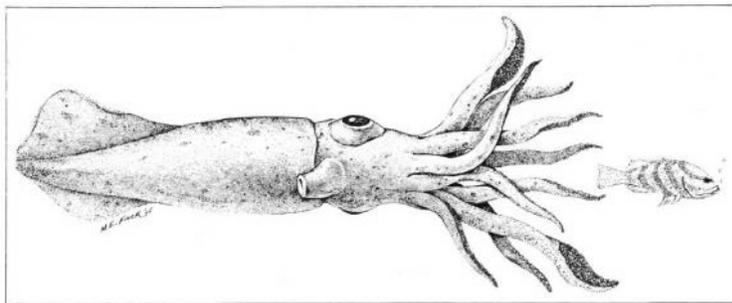
One specific goal of the study will be to gather data on the rapidly changing attitudes toward family planning practices that have taken place during the last five years. This information will then be analyzed and compared with findings from the 1955 and

(See FAMILY PLANNING, Page 8)

Dr. Philip Lee Appointed To New DHEW Position

Dr. Philip Randolph Lee was appointed recently to a newly established position of Deputy Assistant Secretary of Health, Education, and Welfare. He will serve in the area of health and medical affairs.

Dr. Lee comes to the Department from the Agency for International Development where he has served for the last two years as Director of Health Services in AID's Office of Technical Cooperation and Research,



The North Atlantic squid (*Loligo*) captures its prey by engulfing it with tentacles. Propulsion is accomplished by expelling water from the siphon, located just below the eye. Siphon is controlled by impulses from giant axon, an unusually large nerve fiber used in neurophysiology experiments at NINDB.—Drawing by Martin E. Finck.

the NIH Record

Published bi-weekly at Bethesda, Md., by the Public Information Section, Office of Research Information, for the information of employees of the National Institutes of Health, principal research center of the Public Health Service, U.S. Department of Health, Education, and Welfare, and circulated by request to all news media and interested members of the medical- and science-related fields. The NIH Record content is reprintable without permission and its pictures are available on request.

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NEWS from PERSONNEL

SECRETARIAL-CLERICAL

The Employee Development Section, PMB, has published a brochure listing its 1965-66 schedule of training courses for secretarial and clerical employees.

These courses include training in business English, letter writing for secretaries, shorthand refresher courses, and secretarial workshops.

They are presented in brochure form for the entire year to enable supervisors and employees to plan ahead for desired training. During the year each course will be announced separately as it is offered.

The first course this year, in business English, will begin September 21. Brochures and nomination forms have been sent to I/D personnel offices for distribution. Interested supervisors or employees who have not received a brochure by Sept. 15 may obtain one from I/D personnel offices.

Orientation Program

In addition to the above mentioned optional courses offered by PMB, each new secretarial or clerical employee participates in an orientation program which consists of a basic program including a course in telephone techniques and courtesy.

The schedule for the orientation program has been revised this year. New employees will now report to PMB immediately after induction each Monday morning and take part in a basic orientation program lasting until 3 p.m.

After this training session the employees will report to their own Institute or Division. All new employees will be expected to partici-

Congressman Seeks List of Wisconsin Grads in Gov't

The office of Congressman Kastenmeier of Wisconsin is seeking the name, degree, date of graduation, and present position of Federal employees who have been graduated from the University of Wisconsin. If any readers of the *NIH Record* are Wisconsin graduates and Federal employees, the requested information will be appreciated by Congressman Robert W. Kastenmeier, 1203 House Office Building, Washington, D.C. 20515.

pate in this program unless excused by their personnel offices.

The telephone training portion of the program will be given from 1 to 2:30 p.m. This part of the program is open not only to new employees but to any NIH employee who has not had such training.

After securing the consent of their supervisors, employees may call PMB on Ext. 62147 to arrange for attendance at one of the Monday sessions.

OUTSIDE WORK REPORT

Reports from staff members engaged in approved outside work or activity are due not later than September 16. Because of the recent change from semi-annual to annual reporting requirement, the present report will cover the eight months from January 1, 1965 through August 31.

An estimate of outside activity for the 12 months from September 1 to August 31, 1966 must also be reported at this time. Forms on which this report is to be made may be obtained from I/D personnel offices.

4-Story Building 12A Near Completion, Designed for Computer Science Center

Except for finishing touches and landscaping, construction of the 4-story extension to Building 12 is now complete. Numbered 12A, the new building has been assigned for the use of computer science and technology. This assignment, coupled with present computer occupancy of Building 12, will provide for a computer science center on the NIH reservation.

Until the computer program is fully staffed, however, several other organizational units will be moving in shortly to occupy a portion of the new building on a temporary basis.

Design and construction of the

new building, including the remodeling of a large part of Building 12, was handled directly by the Plant Engineering Branch of the Division of Research Services rather than by the General Services Administration. The total cost of the building was \$1.4 million.

The surrounding area, including a sunken garden at the southwest corner of Building 12A, will be landscaped this fall. Special attention will be given to upgrading the present industrial appearance of the area.

The new extension, located north of Building 12, measures 86 feet by 162 feet and contains 60,000 gross square feet. The net usable floor space is 39,246 square feet.

174 Office Spaces

There are 174 office spaces on the top four floors, and the basement will be used entirely for housing mechanical equipment. All computer operations will remain in Building 12.

A 2-story closed passageway connects the two buildings, but only the first-floor level is usable at this time. The second-floor level presently leads into the garage area of Building 12 and will be closed off until that area is renovated into office space at a later date.

The new extension has two elevators and a loading platform, located at the west end near the main entrance. Stairwells are located at both the east and west ends of the building.

Flu Vaccine Schedule Established by EHS For NIH Personnel

Influenza vaccine will be offered to NIH employees this month according to the following schedule:

Building 10 Health Unit, Rm. B2A06, 1:30 p.m. to 4:30 p.m., names A-D, Sept. 20; names E-H, Sept. 21; names I-L, Sept. 22; names M-P, Sept. 23; and names Q-Z, Sept. 24.

Building 31 Health Unit, Rm. B2B34, 1:30 p.m. to 4:30 p.m., Monday, Sept. 27 and Tuesday, Sept. 28.

Building 13 Health Unit, Rm. 2910, 1:30 p.m. to 4:30 p.m., Thursday, Sept. 30 and Friday, Oct. 1.

Westwood Building Health Unit, Rm. 30, 9 a.m. to 4 p.m., Wednesday, Sept. 29.

North Bethesda Office Center No. 1, Rm. 119, 1:30 p.m. to 4 p.m., Monday, Oct. 4.

Wiscon Building, basement level near B1A10, 1:30 p.m. to 4 p.m., Tuesday, Oct. 5.

Individuals vaccinated since July 1963 will need only one inoculation; others will need a second dose. Dates for the second inoculation will be published later.

The vaccine will not be administered to those who are hypersensitive to egg or egg products.

EHS to Show Movie on Ulcer-Producing Tension

The Employee Health Service will present as its September health education film, "The Daily Grind," a dramatic film about a man whose tensions contribute to his having an illness from which millions suffer—an ulcer.

The 26-minute, color film will be shown at the Westwood Building, Conference Rm. A, on Tuesday, Sept. 14, at 1:30 and 2:30 p.m.; Clinical Center auditorium, Sept. 15, at 11:30 a.m. and 1 p.m.; North Bethesda Office Center No. 2, Conference Rm. 113, Sept. 16, at 1:30 p.m.; and North Bethesda Office Center No. 1, Conference Rm. 202, Sept. 16, at 2:30 p.m.

NIAID 'Common Cold' Study Again in Need of Volunteers

This notice, carried in the Aug. 24 issue of this paper, is reprinted at the request of the Laboratory of Infectious Diseases, NIAID.

The NIAID Laboratory of Infectious Diseases is again in need of volunteers for its continuing study of the "common cold."

The researchers in this laboratory are attempting to isolate and identify the viruses which cause common colds.

Volunteers will be asked to contribute nasal washings plus two blood specimens. Interested NIH personnel with colds, preferably within the first three days of illness, may call Mrs. Sara Kelly, Ext. 65811, for additional information. Participants will be paid \$2 for each blood sample.

Lloyd Stewart Named To Civil Defense Post

The appointment of Lloyd R. Stewart as Assistant for Civil Defense Mobilization at the National Institutes of Health was announced recently by George P. Morse, Chief of the Plant Safety Branch, OD.



Mr. Stewart succeeds Edward J. Stevens who recently became the Assistant for Civil Defense to the Acting Director of Field Administration, Office of the Secretary, Department of Health, Education, and Welfare.

Mr. Stewart will develop plans to increase survival chances of NIH employees and nearby Montgomery County residents in the event of major disaster. His first step will be to develop shelter management and self-protection plans and organizations.

Shelters to Be Stocked

NIH buildings already marked as fallout shelters are to be stocked with food, water, medical and other supplies, and personnel will be trained to manage each shelter area.

Mr. Stewart also will assist Mr. Morse in working with NIH mobilization officials and other Public Health Service officials in developing national plans and procedures for an Emergency Health Service.

Before joining NIH, Mr. Stewart served with the Emergency Planning Staff of the Small Business Administration.

He also had 25 years service with the Army, retiring in 1958 as a Lt. Colonel.

Mr. Stewart attended Indiana University and the University of Maryland.

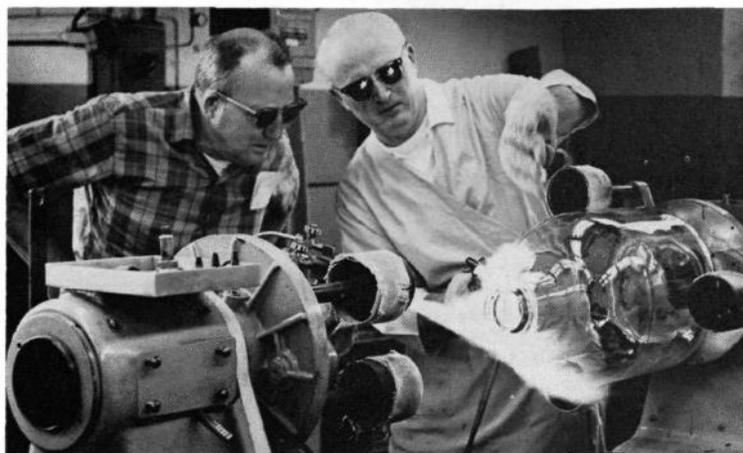
Education Office Issues College Financing Guide

Guidelines to help students and parents shop for the most favorable terms when borrowing money for college education are provided in a booklet recently issued by the Office of Education.

The 14-page publication, "Borrowing for College, A Guide for Students and Parents," discusses loans available through Federal, State, and college programs, and from commercial banks, finance companies, savings and loan associations and credit unions.

"Borrowing for College" (OE-55039) is available at 20 cents per copy from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

DRS's Glassblowing Unit Creates New, Unusual Glassware for Scientists' Use



William Kump, Chief of the Glassblowing Unit, watches as Joe Fox heats a five-gallon jug prior to replacing a broken spout.—Photos by Jerry Hecht.

By Bill Kleven

NIH scientists use more than a half-a-million pieces of glassware each month. Most of it can be, and is, obtained from commercial sources. But research by its very nature demands innovation in techniques and equipment, including newly designed glassware.

Ralph Reeder Appointed NIMH Personnel Officer

Ralph Charles Reeder has been appointed Personnel Officer for the National Institute of Mental Health, effective yesterday, September 7.



Mr. Reeder

The appointment was announced by Dr. Stanley F. Yolles, Institute Director, and John M. Sangster, Chief of the NIH Personnel Management Branch.

Mr. Reeder replaces Paul French who left the Institute in May to take a personnel assignment with the National Institute of Allergy and Infectious Diseases.

Mr. Reeder comes to NIH from the Agricultural Research Service in Hyattsville, Md., where he was Assistant to the Director of the Personnel Division.

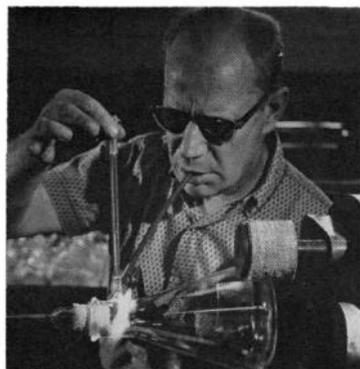
Joins PHS in 1957

He has been with the PHS since 1957, first as a classification and wage specialist at the Regional Office in Berkeley, Calif., and then as a supervisory placement specialist in Beltsville, Md.

He received his M.A. in political science from the University of California at Berkeley in 1957 and his A.B. from Hastings College in Nebraska in 1952. At Hastings he majored in philosophy and sociology.

A native of Longmont, Colo., Mr. Reeder served in the Army from 1952 to 1954 as a transportation agent in Paris, France.

To this end, NIH has its own Glassblowing Unit in the Biomedical Engineering and Instrumentation Branch of the Division of Re-



Edward Wright fuses a new hose connection on a suction flask.

search Services. Tucked away in a corner of Building 13, the unit is made up of five men whose experience in glassblowing adds up to more than 100 years.

Whether it's a 5-gallon beaker, a flask within a flask, or a micropipette with an opening so small that it can only be seen with a microscope, one of these men can make it.

Since most of the work is on newly designed glassware, it is not a case of "you name it, we'll make it," but rather one of "you draw it and we'll make it," according to the Unit Chief, William Kump.

Under these circumstances the scientist designs his own equipment tailored to the needs of a particular experiment. He may want something as simple as an odd-sized test tube or as complicated as a circu-

(See GLASSWARE, Page 7)

1963 Study Shows Only 3.5 Percent of Nurses In Mental Health Work

A detailed study of data collected in a 1963 survey shows that only 3.5 percent of professional nurses were employed in mental health establishments, according to the National Institute of Mental Health.

An estimated 18,500 professional registered nurses were working in psychiatric settings during the first half of 1963, as compared with a total of 532,000 nurses employed in all settings.

The NIMH survey reported that 75 percent of the mental health nurses were employed in public hospitals for the mentally ill, 10 percent in public institutions for the mentally retarded, and 8 percent in private hospitals for the mentally ill.

Field Attracts Males

Relatively few were reported as employed in outpatient mental health clinics and private institutions for the retarded.

It was found that psychiatric nursing attracts more males (7 percent) than other areas of nursing (1 percent). The male nurse is older, with an average age of 43, than the female nurse, with an average age of 41, and has attained a higher level of education.

In addition, the male nurse has had more mental health nursing experience, averaging 14 out of a total of 17 years of professional experience, than the female nurse, who averages 8 years in mental health out of a total of 15 years in nursing.

The American Nurses' Association estimates that 90 percent of employed nurses have no college degree, 8 percent hold baccalaureate degrees, and 2 percent graduate degrees.

24 Percent Hold Degrees

Among mental health nurses, in contrast, 20 percent hold baccalaureate degrees and 4 percent graduate degrees.

Average work week for the mental health nurses surveyed was 41 hours, with a majority of their time spent in direct patient care. Males reported slightly more administrative duties and less time in patient care.

As the education level increases, the time spent in patient care decreases and the time spent in administration and teaching increases. Time spent in research was negligible for all.

The study was published in Mental Health Manpower Current Statistical and Activities Report, July 1965, by the Training and Manpower Resources Branch, NIMH.

Dr. Andrews Retires as Radiation Safety Head; Serves PHS 28 Years

Dr. Howard L. Andrews, Radiation Safety Officer of the National Institutes of Health and Chief of the Clinical Center Department of Radiation Safety, retired from the Public Health Service August 31. He will become Assistant Director for Health and Safety at the Puerto Rico Nuclear Center which is part of the University of Puerto Rico.



Dr. Andrews

Dr. Andrews' affiliation with the Public Health Service dates from 1937. His research contributions have been varied and significant, including the development of instruments for measuring radiation, the biological effects of high doses of radiation, and the applications of human whole-body counter techniques to clinical medicine.

Holds Two Positions

He joined NIH just after the start of World War II, in the Division of Industrial Hygiene, and was named NIH Radiation Safety Officer in 1958. When the Clinical Center Radiation Safety Department was established in 1963, Dr. Andrews was appointed its Chief and held the two positions concurrently.

While conducting research on drug addiction at the PHS Hospital in Lexington, Ky., he was the first to demonstrate that the opiates tend to control the subjective reaction to pain rather than to suppress the sensation of it.

As the program of nuclear weapons testing developed, Dr. Andrews became involved as a member of the advisory panels considering the safety aspects of test detonations.

Since 1945, when he became a PHS Commissioned Officer, he has worked primarily in the field of radiation biology. He headed the Radiobiology Section in the National Institute of Arthritis and Metabolic Diseases for 14 years, and served as Chief of the Radiation Physics Section in the National Cancer Institute from 1959 to 1963.

Receives PHS Award

In February 1965, Dr. Andrews was awarded the PHS Medal for Meritorious Service for "his outstanding achievements in the broad field of physical biology."

Dr. Andrews has been a member of the National Academy of Sciences' Biological Effects of Atomic Radiation Committee since its creation in 1956 and served as its Executive Secretary from 1959 to 1964.

He is a Fellow of the American

Birth Deformities in Lambs Traced to Common Plant Found in High Altitudes

A series of severe birth deformities in lambs has been traced to a common plant found in high altitude feeding ranges in the Rocky Mountain area. The teratogenic effects result from the consumption of *Veratrum californicum*, one of a genus of poisonous herbs, by ewes during the breeding season.

This was reported at a recent NIDR seminar by Dr. Wayne Binns of the U.S. Department of Agriculture. NIDR interest in this subject stems from the Institute's concern with congenital oral-facial malformations and the contributing influences of environmental factors.

Finding Is Significant

This finding is considered of great economic significance because congenital malformations in domestic animals have long been ascribed to genetic defects, due most probably to inbreeding. The accepted solution has been to eliminate animals suspected of being responsible for the "bad line."

Dr. Binns is veterinarian in charge of investigating stock poisoning by plants at the Animal Disease and Parasite Research Division in Logan, Utah. With a team of USDA scientists he began investigating the etiology of the deformity occurring in the lambs in 1955.

Due to the sudden increase in the number of malformations observed, as well as their specificity—cyclopia (fusion of both eyes in the center of the head), hydrocephalus, and cleft palate, the investigators suspected an environmental insult, rather than a genetic factor, as the probable cause.

Determines Area First

Since a retrospective study could not be carried out, Dr. Binns first determined the geographical area where the incidence was highest. He found that the affected herds had all been quartered above 5,000 feet on moist, fertile ranges with a variety of plants for grazing.

To determine whether any of the plants might be the causative agent, Dr. Binns carried out a range-grazing experiment with ewes of known breeding date.

He found that the animals ignored other palatable foliage in favor of *V. californicum*. He then fed *V. californicum* to the ewes in

Physical Society, a member of the Radiation Research Society, and is currently President of the Health Physics Society.

He has authored numerous articles on radiation physics and biology and co-authored the textbook, Nuclear Radiation Physics, which has been a standard college text since 1948.

varying schedules during the critical period of embryonic growth and development.

Lambs with one or more deformities were born to ewes that had eaten the plant on the 14th day of gestation, a critical stage in the organogenesis of the nervous system.

14th Day Important

The severity of deformity seemed to be correlated to the amount of *V. californicum* ingested on that day. Ewes eating the plant any time before, but not including, the 14th day bore normal lambs; those eating it only after the 14th day frequently suffered fetal deaths.

Dr. Binns and his co-workers also observed that some of the ewes bearing malformed lambs had gestation periods that markedly exceeded the usual 147 days. Some of the lambs born of this prolonged gestation period were larger than normal at birth. There was no sex difference in the incidence of malformation.

In several instances of twin births, one lamb appeared normal and the other deformed. This variation was attributed to differing rates of development for each fetus.

Toxic Response Noted

Many of the ewes also had a toxic response to the plant. Their symptoms ranged from vomiting to a dangerous slowing of heart and respiration rate. The researchers found, however, that the toxic reaction lessened or disappeared if the plant was ingested in small amounts over a long period of time.

Research is still underway in USDA laboratories to determine the metabolic pathway by which *V. californicum* exerts its teratogenic effect. Thus far the study has revealed one promising possibility: that an unidentified alkaloid, found in *V. californicum*, may be the causative agent.

The investigators suspect that the substance producing toxic symptoms in the ewes is not the same one that is responsible for the teratogenic effects. Also unknown is the effect, if any, of the plant on other grazing herds, such as cattle or horses. Identification of the responsible plant and its habitat, however, permits a practical preventive measure by grazing the ewes at lower altitudes.

The Statue of Freedom on the dome of the Capitol building is 19½ feet tall, is of bronze and weighs 14,985 pounds. At its base are the words E Pluribus Unum (Out of Many One).—*The World Almanac*.

DR. HERTZ

(Continued from Page 1)

entific accomplishments relate mainly to reproduction and to cancers arising in the reproductive organs.

He and his colleagues developed the first cure by drugs of a rare malignancy arising in pregnant women from what would normally be the afterbirth or placenta.

This condition, called "choriocarcinoma," which was previously fatal, can now be cleared up by drugs in 90 percent of the cases, if treatment is begun early enough. Also in such early cases the patient no longer needs to have her uterus removed and can subsequently have perfectly normal babies.

Hormone Pills Developed

Dr. Hertz, in collaboration with Dr. William W. Tullner, also developed the first orally active forms of hormone pills for the treatment of menstrual disorders in women. Such substances are now used as an ingredient in oral contraceptives, a subject of direct concern to the National Institute of Child Health and Human Development.

Currently Chief of the Endocrinology Branch of the National Cancer Institute, Dr. Hertz received a Distinguished Service Award from the Department of Health, Education, and Welfare in 1963. In 1957 he received the Anne Frankel Rosenthal Memorial Award of the American Association for the Advancement of Science for outstanding accomplishment in the field of cancer research.

A native of Cleveland, Ohio, Dr. Hertz has been with the National Institutes of Health since 1941.



Peggy A. Alexander, CC Blood Bank Department donor recruitment assistant, receives a superior work performance award from Dr. Paul J. Schmidt, Department Chief. Miss Alexander was cited for her dedication to the NIH blood donor recruitment program. Dr. Schmidt said her award is a tribute also to the NIH employees who have responded to her emergency calls for life-saving blood. Sometimes as many as 50 calls must be made to find 5 donors who are both eligible and available.

John Roatch to Direct CC Social Work Dep't; Succeeds Ellen Ferris

John F. Roatch, Research Consultant, Clinical Center Social Work Department, was named Chief of the department, effective September 1, succeeding Ellen



Mrs. Ferris



Mr. Roatch

Walsh Ferris who resigned.

Mr. Roatch joined the PHS Commissioned Corps in 1959 and was assigned to the CC Social Work Department. He served as clinical social worker in the department's Mental Health and Heart Social Work Sections for five years prior to his appointment in 1964 as Research Consultant.

Prior Experience Cited

Before coming to NIH, Mr. Roatch was Chief Social Worker, Section on Alcoholism, Indiana State Health Department, Indianapolis, from 1956 to 1959. His previous experience included psychiatric social positions at the Menninger Foundation in Topeka, Kans.; Dayton Receiving Hospital for Children, Dayton, Ohio; and Larned State Hospital, Larned, Kans.

Mr. Roatch graduated *magna cum laude* from Hamline University, St. Paul, Minn., in 1948, and attended the Graduate School of Sociology, University of Minnesota from 1948-1950. He received his M.S.S.W. at George Warren Brown School of Social Work at Washington University, St. Louis, Mo., in 1952, and also took his doctoral training there in 1963-1964.

New Work Published

Mr. Roatch is the author of several articles in his field, including "Casework Treatment of Spouses of Severely Depressed Hospitalized Patients" which will be published soon.

Mrs. Ferris has been Chief of the CC Social Work Department since 1961. She came to NIH in 1953 and served as Assistant Chief of the department until this appointment.

A native of Ohio, Mrs. Ferris graduated *cum laude* from Seton Hill College in Pennsylvania in 1940 and received her M.A. degree in social service from The Catholic University of America, Washington, D.C.

She is an instructor at The

Clowns Caper and Balloons Fly High at 3rd Annual CC Patients' Carnival Here

By Marilyn Norris
Summer Information Trainee

A most un-hospital air prevailed at the Clinical Center's Third Annual Patients' Carnival here recently. Booths were draped with crepe paper and pennants, music played over a public address system, and a costumed clown swatted playfully at a hula dancer's bare feet.

Because of generous community cooperation, about 200 research patients and their guests were able to be festive for free.

One of the most popular activities was the Space Balloon Booth where patients launched 139 helium-filled balloons with self-addressed postcards.

The card returned from the farthest point will win. Last year's winning card was returned from the Coast Guard Station at Chincoteague, Md.

Booths included turtle races where one energetic turtle named George won most of the races. Vol-



TALL CLOWN in a pink polka dot suit chats with Melissa Ford, 3-year-old Clinical Center patient from Houston, Texas, held by Red Cross Gray Service volunteer Betsy Popof. The clown is Red Tannen, a member of the R&W Association Hamsters. On his stilts Red Tannen is 9 feet tall.—Photos by Ed Hubbard.

New Members Named to Advisory Heart Council

The appointment of two new members to the National Advisory Heart Council was announced recently by Surgeon General Luther L. Terry of the Public Health Service.

Dr. Walter J. Burdette of the University of Utah College of Medicine and Dr. Richard V. Ebert of the University of Arkansas Medical Center will serve four-year terms beginning October 1965.

Catholic University of America School of Social Service and is a visiting lecturer at Columbia University's New York School of Social Work. She also is the author of many articles in her field.

unteers in striped vests helped patients play pokeno, grin for Polaroid photos, have handwriting analyzed, and aim at assorted targets—with darts, bean bags, rings, poker chips and wet sponges.

CC patients drank a pink no-cal punch concocted by the Nutrition Department to satisfy possible dietary restrictions. Also pink, and nine feet tall on stilts, was clown Red Tannen.

The Sheraton Park Hotel's miniature train, which was to give free rides around the reservation, was "derailed 10 miles south," according to a posted sign. Police would not allow it to be driven up Wisconsin Avenue with a defective tail-light.

Many Groups Participate

Volunteers were from B'nai B'rith, Bradley Hills Presbyterian Church, Bethesda Christian Church, Bethesda First Baptist Church, Silver Hill Volunteer Fire Department, Gray Service, Peggy Holt Dancing School, Normal Volunteer patients, and the CC Patient Activities Section which planned the event.

Among CC staff members attending were Dr. Clifton Himmelsbach, Associate Director, and his wife; Janet Fitzwater, Chief, Surgical Nursing Service; and Margaret Badger, Administrative Officer. Mrs. Louise Anderson, Chief of the CC Nursing Department, cut the ribbon opening the carnival.



PINK DOG, presented by Marilyn Schoon, a volunteer from the Bethesda First Baptist Church, wins for Debra Sue Hawkins, a patient from Fairmont, W. Va., the first carousel prize.

Dr. Birren, Director of NICHD Aging Program, Retires September 1

Dr. James E. Birren, a pioneer investigator in the field of aging and Director of the Aging Program of the National Institute of Child Health and Human Development, retired from the Public Health Service September 1.



Dr. Birren

He will become Director of the new Rossmore-Cortese Institute for the Study of Retirement and Aging and Professor of Psychology at the University of Southern California.

Dr. Birren has been Director of NICHD's Aging Program for more than a year. From 1953 to 1964, he was Chief of the Section on Aging in the Laboratory of Psychology, National Institute of Mental Health.

Widely recognized as one of the leading scientists in the aging research field, Dr. Birren has served in the Public Health Service since 1944. He recently received the PHS Meritorious Service Medal "in recognition of his excellent contributions and achievements in the field of Gerontology."

Edits Scientific Texts

Dr. Birren was editor of the Handbook of Aging and the Individual: Psychological and Biological Aspects, published in 1959, and was an editor of Human Aging: A Biological and Behavioral Study, published last year. His most recent volume is a textbook, The Psychology of Aging.

He is co-editor of Behavior, Aging, and the Nervous System and editor of Relations of Development and Aging.

Prior to becoming Chief of the NIMH Section on Aging, Dr. Birren was a research psychologist with that Institute from 1951 to 1953. He served in a similar capacity with the National Heart Institute's Gerontology Branch from 1947 to 1951 and was a Research Fellow at NIH in 1946 and 1947.

Dr. Birren is a native of Chicago and earned his B.Ed. degree from Chicago Teachers College in 1941. He received his M.A. from Northwestern University in 1942 and Ph.D. from the same institution in 1947.

He has received numerous awards for his work in the aging field including the Ciba Foundation Award for Research on Problems of Aging (1956) and the Stratton Award of the American Psychopathological Association (1960).

SQUID STUDY

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at each end, the researchers insert very fine-tipped glass tubes (micro-electrodes) filled with a solution which conducts electricity (concentrated potassium chloride) into the axon, and then study its changes during an impulse.

Scientists now know that certain chemical changes occur as the electrical signal passes through the axon. Charged particles (ions) of sodium and potassium flow through the axon's outer covering (membrane), causing a voltage change to occur in the axon. The impulse moves on and these ions gradually return to their original locations.

More Data Sought

These chemical and electrical events must be more completely understood before the medical scientist can effectively treat the person who has one of the many diseases of the brain and nervous system involving impaired nerve function.

Using the giant squid axon, scientists at the NINDB Laboratory of Biophysics have been carrying on this important research under the guidance of their chief, Dr. Kenneth S. Cole.

In July, five NIH scientists interested in nerve impulse research participated in an NINDB-sponsored conference at the Woods Hole Marine Biological Laboratory, Woods Hole, Mass., attended by nearly 300 scientists.

Drs. Cole, Robert Taylor, Eduardo Rojas, and Richard FitzHugh, of the NINDB Laboratory of Biophysics, and Dr. I. Tasaki, NIMH Laboratory of Neurobiology, presented some of their recent findings concerning nerve membrane and the nerve impulse.

Dr. Cole Honored

The conference participants honored Dr. Cole for his outstanding contributions over the past thirty-five years to the field of nerve conduction. The present thrust of research at NINDB's Laboratory of Biophysics carries on this tradition and seeks to further develop Dr. Cole's methods.

Perhaps the most important single discovery in the exploration of the way nervous signals are generated was that electrical and chemical changes in the nerve cell membrane occur during the impulse. How these changes occur has been the fascinating subject of Dr. Cole's research since 1926.

In 1942 Dr. Cole and Dr. H. J. Curtis made the first direct reading of the voltage (potential) difference between the inside and outside of a nerve's membrane, taking advantage of the squid's giant axon for the experiment.

The large-sized fiber made possible the insertion of one electrode



Dr. James A. Shannon, NIH Director (right), and Mrs. C. K. Himmelsbach of the Clinical Center Social Work Department, admire a tiepin engraved with the PHS seal, which Dr. C. K. Himmelsbach, retiring Associate Director of the Clinical Center, received at a farewell party given by his NIH friends and associates August 13 at the Navy Officers Club. Another gift from NIH staff members—a silver tray engraved with a map of the United States showing locations Dr. Himmelsbach served during his 34 years with the PHS was presented to him by Dr. Jack Masur, Clinical Center Director. Dr. Himmelsbach assumed his duties Sept. 1 as Associate Dean for Research at Georgetown University's Schools of Medicine and Dentistry.—Photo by Jerry Hecht.

into the core of the axon while another electrode rested on the nerve's external surface.

In 1949 Dr. Cole developed the "voltage-clamp" to demonstrate the relationship between electrical voltage and current flowing in an axon during an impulse. This method involves unusually sensitive measurement of membrane potential in the giant squid axon.

This research advance gave birth to other discoveries by Profs. A. L. Hodgkin and A. F. Huxley of Great Britain, who won the 1963 Nobel Prize in physiology for their mathematical description of ion flow in the squid axon during an impulse.

Squid used at the NINDB laboratories are supplied from the Eastern Shore of Maryland. They are brought here, by truck, in an aquarium.

Chilean Squid Larger

Each summer some of the staff move to Woods Hole where fresh squid are available daily. For a long time scientists have known of the much larger squid available off the coast of Chile.

Within this larger squid, the giant axon may reach a diameter of one and a half millimeters (three times the size of the North Atlantic squid's axon). Using this unique structure, experiments can be carried out which are impossible to accomplish with any of the smaller squid available in the northern hemisphere.

Dr. Taylor points out that scientists in many laboratories have succeeded in "replacing the internal contents of the squid axon with salt

DR. MOHLER

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at the McCollum Pratt Institute of Johns Hopkins University.

He returned to NCI in 1959, serving as a Senior Investigator in the Clinical Pharmacology and Experimental Therapeutics Service which later became the Laboratory of Chemical Pharmacology.

From Cleveland, Ohio, Dr. Mohler received his B.A. degree in psychology from Yale University (1949) and his M.D. from Columbia University's College of Physicians and Surgeons (1953).

He was an intern and an assistant resident in the medical service of the Presbyterian Hospital in New York City. His primary research interests are cell biology and pharmacology, and he has collaborated with Dr. Mortimer M. Elkind on Cancer Institute studies in cellular radiobiology.

Dr. Mohler is a member of the American Association for the Advancement of Science, the Society of General Physiologists, and the New York Academy of Science.

solution (perfusion), in order to more easily study how the axon functions.

"In a sense," he maintains, "we are approaching the end of an era in physiology. Aspects of nerve conduction such as the relationship between electrical voltage in nerve and eye movements, are well understood.

"We know there is probably a two-molecule fatty acid layer mak-

The Second Edition of Lab Animal Care Guide Is Broader in Scope

The Public Health Service has announced the publication of a second edition of the Guide for Laboratory Animal Facilities and Care, a 45-page reference booklet for institutions with laboratory animal programs. The scope of the first edition, published in March 1963, has been broadened to include recommendations on care and facilities for large domestic animals.

"The second edition of the Guide," Surgeon General Luther L. Terry said, "reflects a growing recognition that the care of laboratory animals is an institutional responsibility as well as the responsibility of individual investigators.

"The animal care programs of most large institutions are based increasingly on this partnership of responsibility, and the recommendations in the Guide assume it.

"The scientific community has long recognized a scientific and ethical responsibility to provide humane care for experimental animals used in the service of man and animals," Dr. Terry added.

"This commitment to high standards is expressed in the codes guiding animal experimentation and care adopted by numerous scientific societies and institutions. The second edition of the Guide extends these codes by defining humane care in professional terms."

DRG Distributes Booklet

The booklet is distributed by the Division of Research Grants to all scientific investigators who receive PHS support for research involving animals. It makes recommendations for the appropriate training and evaluation of animal caretaking personnel and professional supervisors, and describes the physical facilities necessary for the suitable care of laboratory animals.

Appropriate cage sizes, postoperative care, cage washing and other procedures are also suggested. These recommendations are based on scientific principles, expert opinion and experience with methods and practices which have proved to be consistent with high quality animal care.

The new edition was prepared by the Institute of Laboratory Animal Resources (National Academy of Sciences-National Research Council) under a contract administered by the Animal Resources Branch of the Division of Research Facilities and Resources.

ing up the nerve membrane, but we aren't certain of the other constituents. Application of the most advanced techniques to the study of giant axons in the large Chilean squid makes discovery of these other portions foreseeable."

Dr. Meader Leaves NCI; 18-Yr. Career Parallels Research Grants Growth

Dr. Ralph G. Meader, Associate Director for Grants and Training of the National Cancer Institute, is leaving Federal employment in mid-September to assume responsibility for the administration of the research program at Massachusetts General Hospital, Boston. He ends a term of service here that coincides with the period of rapid growth and expansion of the NIH research grants program.



Dr. Meader

Dr. Meader came to NCI in 1947 as a consultant and Scientific Director of the Cancer Research Grants and Fellowships Branch.

None of the other categorical Institutes of NIH had yet been created. The Division of Research Grants was less than two years old.

It was in 1947 that the grants and fellowships appropriation had for the first time reached \$500,000. From 1938, when the NCI grant program had officially begun, until 1947, the figure had remained in the neighborhood of \$100,000.

Research Expanded

By the time Dr. Meader took up his consultant post here the Fiscal Year 1948 appropriation approximated \$2.5 million and the Congress had provided over \$2 million to begin the NCI research facilities construction program which has expanded into the Health Research Facilities Program of NIH.

In May 1948 Dr. Meader joined NCI on a full-time basis and became successively Deputy Chief and Chief of the Research Grants Branch in the period 1948-60, and Associate Director for Grants and Training, 1960-65.

He was active in the development of policies and plans for the research and training programs of NIH and PHS generally, and was primarily responsible for such programs in NCI. The Institute's grant program has expanded to an annual appropriation of more than \$72 million.

Much of Dr. Meader's own time has been devoted to work on the NCI Specialty Fellowships Board. During his service in both policy development and program operating capacities here, his advice has been sought by other Federal, state and private organizations.

He helped to organize the first Gibson Island Conference on Cancer that has developed into the annual Gordon Conference on Cancer, and he is now a member of the Selection and Scheduling Committee of the conferences.

Grounds Unit Labors to Save NIH Trees Threatened by Construction and Drought

Four consecutive years of drought, plus new building excavations, utilities trenching, and additional roads and parking lots, are endangering one of the greatest natural assets of the NIH reservation—its trees.

Obviously, the trees in construction sites have to be removed or transplanted. But more important and far-reaching is the lowering of water tables caused by trenching and large excavations. Pavement also causes a smothering effect, shutting off soil air and preventing natural percolation of rain water into the soil.

Charged with the responsibility of protecting the trees from such natural and man-made elements is the Grounds Maintenance and Landscaping Section of the Plant Engineering Branch, DRS.

Section Chief Milford Myers says that the older, mature trees are of primary concern, for it is impossible to transplant them.

Trees Weakened

"Even though a tree may not actually be touched," says Mr. Myers, "such changes as raising or lowering grades in the vicinity, changes in the water table, and compaction weaken the trees, which, in turn, are targets for insects and disease."

During the initial planning of any construction at NIH, Mr. Myers and his staff play a significant role in the design and selection of sites which will affect the minimum number of trees.

For example, a shallower-footed, lower-faced curb than normal was used along North Drive and Wilson Drive to avoid deep excavation in root zones of mature trees.

A native of Michigan, Dr. Meader received the A.B. degree from Ohio Wesleyan University, the M.A. from Hamilton College, and the Ph.D. in anatomy from Yale University, where he became an instructor in that subject in 1931. He had risen to the rank of Associate Professor at the time of his departure to join NCI.

From 1938 to 1939, Dr. Meader was a Rockefeller Foundation Fellow in Neurology working with Prof. Ariens Kappers at the Central Institute for Brain Research, and with Prof. Bernard Brouwer at the Neurological Institute of the University of Amsterdam in The Netherlands.

From 1942 to 1948 he served the Jane Coffin Childs Memorial Fund for Medical Research, first as Assistant to the Director, then as Assistant Director. He has been Executive Secretary for the National Advisory Cancer Council since 1947.

A Fellow of the American Association for the Advancement of Science, he is a member also of the American Association of Anatomists; American Association for Cancer Research; Corporation of

the Bermuda Biological Station for Research, Inc.; Phi Beta Kappa, Sigma Xi, and numerous medical and technical societies. He is the author of 22 published papers.

During the past year over 860 shrubs, 63 trees, and 10,000 ground cover plants have been transplanted from construction sites. The trees ranged from 3 to 15 inches in diameter, were 15 to 35 feet high, and weighed from 400 pounds to 20 tons. Of these, only three medium-sized trees have been lost.

Beech, Willows Transplanted

In addition, 25 young American beech have been transplanted from the Poolesville Animal Center to NIH, and 30 weeping willows have been started along the stream banks and are doing well.

Other trees, not transplanted, have been prepared as much as possible to withstand the shock of a changing environment by fertilizing, pruning, and watering.

Wetting agents allow deeper penetration of water, and antitranspirants reduce moisture loss through the foliage.

Sprinkling systems are being operated around-the-clock in critical areas, even when it is raining.

A stepped up insecticide and fungicide spray program to protect weakened trees is also in progress.

Mr. Myers says that future losses of healthy, mature trees can be expected. "The worst area will be along Old Georgetown Road and the area of the new NCI-NINDB-NIMH complex," he said.

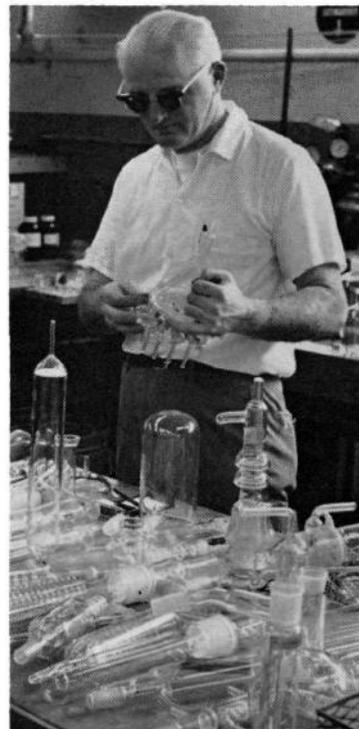
Contract Awarded for Cancer Research Using Rat-Size Marsupials

Several species of rat-size marsupials—relatives of the opossum—from South America and Australia, will be established as laboratory animals and used in cancer research by University of California scientists who have been awarded an initial \$97,433 contract by the Public Health Service.

The contract will be administered by NCI investigators who are interested in developing new systems for testing potential cancer-causing agents.

Since much of the embryonic development of young marsupials may be observed directly while they are in the mother's pouch, these animals provide special opportunities for determining the effects of cancer-causing chemicals on normal growth.

the Bermuda Biological Station for Research, Inc.; Phi Beta Kappa, Sigma Xi, and numerous medical and technical societies. He is the author of 22 published papers.



Joe Fox tags for identification one of several pieces of repaired glassware shown in the foreground.

GLASSWARE

(Continued from Page 3)

lar manifold with a tube within a tube having a dozen lead offs.

Whatever the case, the investigator sends a rough sketch, along with the specifications, to the Glassblowing Unit. Except for the unusually difficult jobs, the finished product will be back on his desk within a week.

Most of the work in the unit is with pyrex. However, there are exceptions. One job in which Mr. Kump takes particular pride is a glass electrode made by himself.

It consists of lead glass, sodium-free glass, asbestos fiber, and platinum and silver wires. "The real trick is to fuse the body of the electrode, which is made of lead glass, to the bottom bulb made of sodium-free glass," said Mr. Kump.

Quartz Cell Designed

Another piece to which the glassblowers point with pride is a quartz cell used in photochemical studies of nucleic acids. The ability of quartz to transmit ultra violet light makes it an invaluable tool.

The cell, which took William Dehn an entire week to make, was formed by first cutting a quartz cylinder into two half-circles. These two pieces were then fused together at the edges and a neck put at the top to form something similar to a hip flask. The solutions under study are placed inside the cell, which is positioned around a UV light.

"Truly a piece of art," was the comment of the investigator upon receiving the cell.

FAMILY PLANNING

(Continued from Page 1)

1960 surveys.

In addition, survey findings will supplement official government statistics by supplying data on family planning, fertility, and sterility, that is not collected by such agencies as the Bureau of the Census and the National Center for Health Statistics.

Data collected will have considerable significance to health research efforts. For instance, when the last survey was made in 1960 oral contraceptives were just going on the market.

Updates Prior Survey

Since that time, their use has grown to include an estimated 6 million women in the world, including some 4 million Americans. Thus the older surveys, though still containing useful information, need updating to encompass data on oral contraceptives not included in earlier studies.

The 1965 study will provide data on a full range of characteristics of families using various fertility control methods, and will provide important baseline data from which other studies, geared more specifically to health problems, can be formulated.

Study data are expected to shed light on trends in sterility induced by various causes, including voluntary surgical sterilization for fertility control purposes.

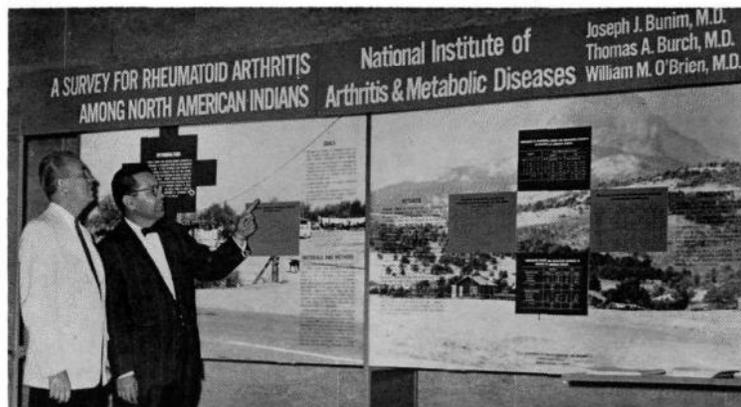
Questions asked during survey interviews will include those on demographic characteristics of the family, detailed pregnancy and fertility data, attitudes toward future pregnancies, size of family desired, and types of family planning methods used.

Needed Information Listed

Information gathered on characteristics of individuals in the study sample will concern: birth control methods previously used; side effects reported by women using various fertility control methods; time required to regain fertility after discontinuing oral contraceptive use; socio-economic background of the family; age; estimates of women's age distribution at menopause; sources of family planning information.

Dr. Charles F. Westoff, Professor of Sociology, Chairman of the Department of Sociology, and Associate Director in the Office of Population Research at Princeton; and Dr. Norman B. Ryder, Professor of Sociology at the University of Wisconsin, will be principal investigators for the project.

Overheard on the NIH reservation—One employee to another: "So many people ask me for directions; I often wonder where they end up when I tell them."



Dr. Thomas A. Burch (right), of the National Institute of Arthritis and Metabolic Diseases, shows NIAMD Executive Officer Willam G. Baylis graphic results of his study in a new Institute exhibit. Dr. Burch, head of an NIAMD team making epidemiological studies of arthritis and diabetes among North American Indians, found that the Pima Indians inhabiting the warm Arizona climate have a higher occurrence of rheumatoid arthritis than the Blackfoot Indians of Montana.—Photo by Ed Hubbard.

Over \$1 Million in Contracts Awarded For Intensive Virus-Leukemia Research

8 Groups to Study Leukemia in Cattle In NCI Program

Leukemia in cattle will be the subject of eight studies supported by awards totaling more than \$1.25 million from the Public Health Service. These studies will be an integral part of the special virus-leukemia program of the National Cancer Institute.

Research on bovine leukemia has been stimulated by recent reports of virus-like particles in cow's milk, revealed by the electron microscope.

The particles were found in greatest quantity in a few individual and pooled samples of milk from an experimental herd with a high incidence of leukemia. Cattle known to have leukemia are not used for commercial dairy purposes.

Possibility Remote

The possibility that these particles are related to human leukemia is minimized by the relatively small number of leukemia cases—17,000 per year in the U.S.—compared with the millions of persons who drink milk regularly.

The new Institute-related work, however, will help determine if the observed particles represent viruses, are causally related to leukemia in cattle, and are similar to viruses known to cause leukemia in laboratory animals.

The projects will be located at the University of California, Davis and Berkeley; University of Pennsylvania, Philadelphia; University of Minnesota, St. Paul; State University of New York, Syracuse; South Jersey Medical Research Foundation, Camden, N.J.; and the

Mycoplasma Studies To Be Conducted By 3 Institutions

Mycoplasma — microorganisms appearing frequently in human and animal leukemic tissues—will be intensively studied by scientists in three institutions awarded contracts totaling \$189,685 by the Public Health Service. The contracts will be administered by the National Cancer Institute.

The institutions and amounts of the contracts are: University of Texas M. D. Anderson Hospital and Tumor Institute, Houston (\$99,629); Wistar Institute, Philadelphia (\$49,125); and Roswell Park Memorial Institute, Health Research Division, Buffalo (\$40,931).

Studies Are Broad

The studies will help determine if mycoplasma are causally related to leukemia, if they are contributory factors, or if they are "passenger" agents.

Studies such as these on the cause and prevention of leukemia constitute one of the four principal areas of the Cancer Institute's special virus-leukemia program. Other program areas are treatment of human leukemia, the nature of animal leukemias, and the control of hazards involved in virus-cancer research.

Because mycoplasma may resemble viruses closely in size,

Public Health Service's Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

The study at the Taft Center is being supported by a transfer of funds from NCI; the others, under contract arrangements.

Child Health Establishes 3 Training Committees

The National Institute of Child Health and Human Development has established three training committees to review all training applications in the Institute program areas of Reproduction, Child Development and Mental Retardation, and Aging.

These newly formed program-oriented committees will review all training grants, career awards, or fellowships pertinent to the interests of the program areas with which each committee is concerned.

They replace two former committees, one of which was concerned with training grant applications for all NICHD program areas, and the other which was concerned with all career award and fellowship applications in the Institute's area of interest.

Establishment of the new committees will provide for a sharper focus by each committee on training important to specific programs and scientific fields, and will give scientists with special competencies in a particular program area a better chance to advise on training needs in their own specialty fields.

NIH Orchestra Begins 7th Season Rehearsals

The NIH Orchestra, sponsored by the Recreation and Welfare Association of NIH, will begin rehearsals for its seventh concert season next Tuesday, September 14, at 8 p.m. in the CC auditorium.

Thereafter, rehearsals will be held every Tuesday evening at the same time and place.

Mark Ellsworth, Concertmaster of the National Gallery Orchestra, will again conduct the NIH Orchestra. Membership is open to any NIH employee or family member, able to play an instrument.

structure, and certain chemical properties, improved techniques must be developed to characterize and differentiate these organisms.

The studies will attempt to detect mycoplasma in the bone marrow and sera of leukemia patients and to correlate their presence with the course of the disease and the immunologic status of the patient.

Leukemic and normal cells grown in tissue culture will be examined for the organisms, and practical methods of preventing mycoplasma contamination of cultures will be devised.

The research will also evaluate the effects of infecting mice with mycoplasma, both alone and in combination with viruses that cause leukemia in these animals. Animal cell cultures will also be infected to study the changes induced.