

the



Record

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NATIONAL INSTITUTES OF HEALTH

Cancer Mortality Study Of U.S. Nonwhites Shows Relation to Environment

A new geographical study of cancer death rates among the non-white population in the United States further supports a relationship between environment factors and cancer risks, according to a recent National Cancer Institute report.

The *Atlas of Cancer Mortality Among U.S. Nonwhites: 1950-1969* describes cancer death rate patterns which often were similar for nonwhites and whites, but further study will be necessary before many of the specific reasons for these patterns can be identified.

Relates To Other Atlas

The *Atlas* is a companion publication to the *Atlas of Cancer Mortality for U.S. Counties: 1950-1969*, which describes geographic patterns for cancer among whites.

Authors of both volumes are Dr. Thomas J. Mason, Frank W. McKay, and Drs. Robert Hoover, William J. Blot, and Joseph F. Fraumeni, Jr., of the NCI Environmental Epidemiology Branch.

Both publications are based on
(See *CANCER STUDY*, Page 5)

3 NIH Publications Win 1976-77 STC Awards

Three NIH publications received awards from the Society for Technical Communications at the 1976-77 awards luncheon at the Washington, D.C. chapter on Jan. 18 at the Bolling AFB Officers Club.

In the brochures category, *The Human Heart—A Living Pump*, a National Heart, Lung, and Blood Institute publication, won an Award of Excellence.

In the house organs category, the *NIH Record* was presented an Award of Excellence.

The *Journal of the National Cancer Institute* received an Achievement Award in the complete periodicals category.

Winners of the Awards of Excellence are entered automatically in the STC International Publications Competition in May.

Experts in Many Areas Pool Knowledge, Aid Persons With Rare Bone Diseases

The bone disease center at the Washington University Medical Center in St. Louis is one of the world's most comprehensive facilities for treating diseases that affect the bone.

Using a 25-bed General Clinical Research Center, funded by the Division of Research Resources, experts in endocrinology, pathology, internal medicine, radiology, nu-



Dr. Avioli points out signs of bone disease on an X-ray.—Photos by Tony Schanuel.

clear medicine, medical genetics, pediatrics, and orthopedic surgery pool their knowledge in both clinical and research areas.

Since 1966, more than 1,500 persons with bone disease have come to the center. Often their disease is rare, or thought to be incurable, or may require detailed study before any diagnosis or treatment can be determined.

Dramatic progress by Dr. Louis V. Avioli, director of the Division of Bone and Mineral Metabolism, and his associates is evidenced by "miracle cure" stories related by patients:

- A 14-year-old boy from Australia, confined to a wheelchair for 4 years with a severe form of vitamin D-resistant rickets, walks out the door with the help of crutches and with hope of discarding them forever.

- A Seldon, N.Y., youth, unable to walk or stand due to a resident form of rickets, now plays football with friends.

- A middle-aged Hawaiian, who suffered from severe osteoporosis of the spine and was in constant pain, experiencing actual physical shrinkage, reports that he is "overjoyed by return of muscle strength in my forearms; my back feels stronger,

and I no longer fear that my legs won't hold up."

- A choreographer—suffering from progressive loss of bone, became immobilized and hunched over in a wheelchair most of the time—now, after diagnosis and treatment, is able to walk about with a cane.

The areas of bone study and treatment include Paget's disease, various types of rickets disorders, chronic renal disease, osteogenesis imperfecta, effects of cortisone on bone metabolism, the relationship of vitamin D and bone loss, and bone reduction in diabetics and chronic alcoholics.

Studies at the Bone Center also are relevant for the general public.
(See *BONE EXPERTS*, Page 4)

Dr. Oleg Jardetzky, DRR Grantee, Wins Von Humboldt Award

Dr. Oleg Jardetzky, professor of pharmacology at the Stanford University School of Medicine, has received the Alexander von Humboldt Award.

Dr. Jardetzky is the principal investigator and director of the Stanford Magnetic Resonance Laboratory supported by the Division of Research Resources.

The award of \$15,000 recognizes the scientist's pioneering work on the application of nuclear magnetic resonance to the understanding of protein structure and dynamics.

The method of nuclear magnetic resonance makes it possible for researchers to pinpoint all the atoms in a complex protein molecule.

The Stanford laboratory was among the first to introduce this technique which allows observation of how atoms move through space and time.

The Alexander von Humboldt Foundation was created in 1860, and is now conducted under the auspices of the government of the Federal Republic of Germany. Its objective is to encourage international academic cooperation.

Research on Prisoners Is Subject of Commission's Recently Released Report

On Jan. 14 HEW Secretary David Mathews released the *Report and Recommendations on Research Involving Prisoners* compiled by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research.

The Commission was established in late 1974 under the National Research Act, Public Law 93-348, and was required to make recommendations with regard to research on human subjects generally, and on prisoners, the mentally infirm, psychosurgery, and the fetus.

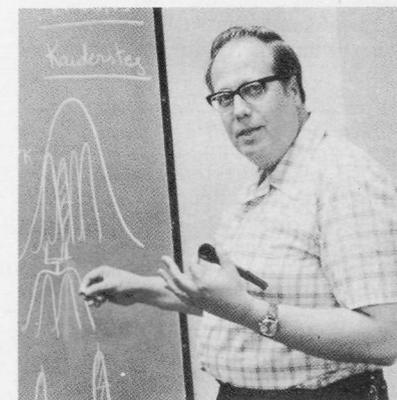
Recommendations Implemented

Recommendations on fetal research appeared in August 1975, and were promptly implemented by HEW.

The Commission has carried out an extensive study of the nature of research on prisoners conducted in the U.S. In addition, Commission members made visits to four prisons, including interviews with inmates who had been research subjects. Consultants to the Commission conducted similar studies at five additional prisons.

Public hearings were held to hear testimony from prisoner advocates, prisoner legal services, research scientists, and members of the general public.

The Commission also sponsored
(See *PRISONER RESEARCH*, Page 6)



Dr. Jardetzky—pictured teaching at Stanford—will be presented the von Humboldt award in Bonn, Germany, on Feb. 20.

the NIH Record

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Tax Forms, Aid on Returns Will Be Available on Feb. 2

Tax forms, tax information, and limited assistance in computing 1976 returns will be available for NIH employees in Bldg. 31, Room 7A-08, beginning Feb. 2, from 10 a.m. to 2 p.m., Monday through Friday.

Appointments may be made on Wednesdays *only* by calling Ext. 62018.

Prior to seeking assistance, employees should prepare a "draft" copy of their return, and bring to the tax assistant when requesting help the material furnished by the Federal and State governments.

This is a service provided by the Division of Personnel Management.

Radiation Safety Talks For Housekeeping NIH'ers

How to avoid the potential hazards of radiation sources will be discussed in a presentation entitled Radiation Safety for Housekeeping Personnel.

So that all interested persons may attend, three sessions will be held in the CC Masur Auditorium:

Wednesday, Feb. 9, from 2 to 3 p.m. and from 5 to 6 p.m.

Thursday, Feb. 10, from 2 to 3 p.m.

The program will be presented by the Radiation Safety Branch, DRS, in cooperation with the Environmental Sanitation Control Department, CC, and the Sanitation Services Branch, DAS.

Interested employees should contact their supervisors to schedule attendance.

History of Med. Soc. Meets Tomorrow to Hear 2 Speakers

The next meeting of the Washington Society for the History of Medicine will be held tomorrow (Thursday, Jan. 27) at 8 p.m. in the Billings Auditorium at the National Library of Medicine.

Fear, Confusion, Optimism; Pediatricians and the Mental Hygiene Movement will be discussed by Alice Smuts, University of Michigan.

Also, Dr. Kehl Markley, National Institute of Arthritis, Metabolism, and Digestive Diseases, will give an illustrated lecture on The Art of Healing in Pre-Hispanic Peru.

Visitors are welcome.

Blood Donor Month Held; Everyone Urged to Give

In celebration of National Blood Donor Month—January 1977—President Ford issued the following statement:

"Blood Donor Month gives all Americans an annual opportunity to honor their fellow citizens who have voluntarily given blood so that others might live.

"Their gift is easy and painless. Yet it represents one of the supreme acts of human compassion and generosity.

"It has earned them the thanks of many grateful recipients and of a nation whose well-being they have served.

"I urge every American to join in building an all-voluntary system of blood donation. It is in the finest American tradition of humanitarian concern for those in need."

Everyone is urged to give blood in support of patient care and the NIH Blood Assurance Program in the Clinical Center.

To become a volunteer donor, please contact Jimmie Driscoll, CC Blood Bank, Ext. 61048, 8:30 a.m. to 4 p.m.

Special Westwood Drive Seeks Blood Donors

Because blood shortages are greatest during the winter season, the Clinical Center Blood Bank and the Montgomery County chapter of the American Red Cross are holding a drive at the Westwood Bldg., Conference Room D, on Tuesday, Feb. 1, from 9:30 a.m. to 3:15 p.m., for new and regular donors.

Help make this winter safe for those who need blood.

Maximum Per Diem Travel Costs Increase

The maximum daily per diem travel allowance has increased from \$33 to \$35, effective Oct. 1, 1976. It was last increased in May 1975.

The rate is higher in some, specified, cities: Washington, D.C., and Queens and Brooklyn, N.Y., are now \$50 a day. New York City metropolitan area was already \$50. Others above the \$35 maximum are Boston, \$49; Philadelphia, \$46; Chicago, \$43; Newark, \$42; San Francisco, \$41; and Los Angeles, \$40.

The uniform daily allowance for meals and other expenses has increased from \$14 to \$16 a day.

The mileage rate for Federal employees who use their own cars on Government business has increased from 15 cents to 15½ cents a mile. For privately owned aircraft used on Government business the rate has increased from 22 cents to 24 cents a mile.

Also the Washington, D.C., rate has been expanded and now includes—in Virginia—the cities of Alexandria, Falls Church, Fairfax, and the counties of Arlington, Loudoun, and Fairfax. In Maryland it includes Montgomery and Prince George's counties.

Active C.O.'s Get Dental Care

Commissioned Officers of the U.S. Public Health Service on active duty and assigned to NIH can receive dental care at the Commissioned Officers Dental Clinic, Bldg. 31, Room B2-B34.

For more information and appointments, call Ext. 62944 between 8:30 a.m. and 2 p.m.

Registration for FAES Courses Jan. 27-Feb. 2

In-person registration for spring courses in the Graduate Program, sponsored by the Foundation for Advanced Education in the Sciences, begins tomorrow (Thursday, Jan. 27) through Feb. 2 in the FAES office located in the Bookstore, Bldg. 10, Room B1-L-101.

The spring Catalog Supplement omitted in error the course on Medical Bacteriology, MICR 300, which will be given on Wednesdays, from 5:30 to 7:30 p.m.

Also, a new course, Introduction to Studio Art, GENL 106, is being offered on Thursdays from 7:40 to 9:40 a.m.

PSYC 426, Death and Dying, has been cancelled by the instructor.

For information, call Ext. 65272.



Computer operator Linda Ford puts a fresh roll of paper into the new IBM 3800, the high-speed printer recently installed in the National Library of Medicine's computer room. Instead of printing by the impact of mechanical type, the IBM 3800 uses a combination of laser and electrophotographic technology. The previous printer produced off-line rates of about 900 lines per minute. The new printer's high-speed capability of about 9,000 lines per minute should continue to assure next-day mailing of bibliographies printed off-line, even with increased use of the system.

NIH Visiting Scientists Program Participants

1/1—Dr. Katerina Dorovini-Zis, Greece, Medical Neurology Branch. Sponsor: Dr. W. King Engel, NINCDS, Bg. 10, Rm. 10D16.

1/1—Dr. Israel Izja Lederhender, Canada, Section on Neural Systems. Sponsor: Dr. Daniel L. Alkon, NINCDS, Bg. 36, Rm. 2A29.

1/1—Dr. Hiroshi Oda, Japan, Laboratory of Central Nervous System Studies. Sponsor: Dr. Carleton Gajdusek, NINCDS, Bg. 36, Rm. 5B16.

1/1—Dr. Michael Przybylski, Germany, Laboratory of Chemical Pharmacology. Sponsor: Dr. Richard H. Adamson, NCI, Bg. 37, Rm. 5D.

1/1—Dr. Georg Stingl, Austria, Dermatology Branch. Sponsor: Dr. Stephen I. Katz, NCI, Bg. 10, Rm. 12N250.

1/2—Dr. Tetsuo Arimitsu, Japan, Section on Neurochemistry. Sponsor: Dr. Giovanni Di Chiro, NINCDS, Bg. 10, Rm. 2D15.

1/2—Dr. Cesare Fieschi, Italy, Laboratory of Cerebral Metabolism. Sponsor: Dr. Louis Sokoloff, NIMH, Bg. 36, Rm. 1A27.

Comes From Japan

1/2—Dr. Toshiro Fujita, Japan, Hypertension-Endocrine Branch. Sponsor: Dr. Frederic C. Bartter, NHLBI, Bg. 10, Rm. 8N214.

1/2—Dr. Kathe Jentzsch, Austria, Radiation Oncology Branch. Sponsor: Dr. Ralph E. Johnson, NCI, Bg. 10, Rm. B3B38.

1/2—Dr. Lawrence C. Pollak, U.S.A., Arthritis and Rheumatism Branch. Sponsor: Dr. John Decker, NIAMD, Bg. 10, Rm. 9N218.

1/5—Dr. Richard Kvetnansky, Czechoslovakia, Laboratory of Clinical Science. Sponsor: Dr. Irwin J. Kopin, NIMH, Bg. 10, Rm. 2D46.

1/6—Dr. Walter Fratta, Italy, Laboratory of Preclinical Pharmacology. Sponsor: Dr. Erminio Costa, NIMH, WAW Bg., St. Elizabeths Hospital, Washington, D.C.

1/9—Dr. Bruce Leonard Webber, South Africa, Laboratory of Pathology. Sponsor: Dr. Louis B. Thomas, NCI, Bg. 10, Rm. 2A29.

1/11—Dr. Paul Grof, Canada, Laboratory of Clinical Science. Sponsor: Dr. Dennis L. Murphy, NIMH, Bg. 10, Rm. 3S229.

Four Russian Visitors Tour NEI Research Facilities, Inspect Q-Switched Laser



Left, Dr. Nelson (r) describes the electrophysiology of a cat retina to Mr. Gorelik (l front), Mr. Zimin, and Ms. Frida Grauer, an interpreter. At rear are Mr. Goglidze (l) and Julian M. Morris, NEI director of information. Above, Dr. Gaasterland (l) explains how the new Q-switched laser works to Mr. Zimin (c) and Mr. Gorelik.—Photos by Sally DiMartini, AFB.

As part of a nationwide tour of U.S. facilities for the blind, four visitors from the All Russia Association of the Blind recently visited the National Eye Institute, showing great interest in its research.

Included in the tour—sponsored by the American Foundation for the Blind—were Boris Zimin, president of the All Russia Association of the Blind and president of the World Council for the Welfare of the Blind; Sergei A. Jamakochian, head of the Department of Employment, Ministry of Social Security of the Russian Federation; Akaki A. Goglidze, president of the Georgian Association of the Blind; and Mikhail E. Gorelik, principal of the Moscow School for Partially Sighted Children.

Also with the group were Jack Ross, assistant to the executive director of the AFB, and other AFB representatives.

The visit followed a similar tour of the Soviet Union by U.S. leaders in blindness rehabilitation last year.

The NEI tour began at the Clinical Center with a demonstration, by Dr. David Cogan and his staff, of research on eye movement abnormalities, aimed at improving diagnosis and understanding of the origin of these disorders.

Eye movements are stimulated by having an individual follow a target of light while seated in a rotating

motorized chair placed in a large dark drum. Response to stimulation of the entire visual field is measured by electro-oculography, a technique for recording changes in electrical potential of the skin around the eyes when the eyes move off center.

Since different portions of the brain control different aspects of eye movements, electro-oculography may be useful in localizing lesions in the brain which cause eye movement abnormalities.

Next, Dr. Ralph Nelson demonstrated recordings of electrical responses from individual cells in the cat retina to various kinds of visual stimulation. These studies are aimed at better understanding the functional organization of the retina and how it is affected by disease.

Finally, Dr. Douglas Gaasterland showed the visitors NEI's new Q-switched laser which will be used in experimental glaucoma surgery with monkeys.

Most cases of chronic open angle glaucoma can be adequately treated with medication applied several times daily. In some patients, however, medication is not sufficient and surgery, which is 60 to 85 percent successful, is the only alternative. NEI is searching for ways to improve this success rate.

The impetus for this project came from an exchange of visits between Dr. Carl Kupfer, NEI Director, and Dr. Mikhail M. Krasnov, Director of the State Institute of Ophthalmology in Moscow.

Studies by Dr. Krasnov, who pioneered the use of the Q-switched laser for treating glaucoma, suggest that lasers of this type may provide an alternative to conventional glaucoma surgery.

However, Dr. Krasnov found that this treatment must be repeated every 6 months. NEI is investigating whether the required frequency of laser therapy could be reduced and if its use could replace

Dr. Gottschalk Is Given Kidney Foundation Award

Dr. Carl W. Gottschalk, University of North Carolina, was recently presented the David M. Hume Memorial Award.

The presentation was made by Dr. Nancy B. Cummings, associate director for Kidney, Urologic, and Blood Diseases in the National Institute of Arthritis, Metabolism, and Digestive Diseases.

Dr. Gottschalk—honored at the National Kidney Foundation annual award banquet in Washington, D.C.—was cited for his

significant contributions to the understanding of kidney function, notably for the development of a technique for analysis of nephron function in mammals.

This technique has opened the door to a wealth of knowledge about kidney activity in health and disease.

He is co-chairman of a NIAMD-supported study, Evaluation of Research Needs in Nephrology and Digestive Diseases.

Fluorides and Caries: Proceedings of Dental Symposium Published

The proceedings of an international symposium on the Cariostatic Mechanisms of Fluorides have been published as a special supplement to *Caries Research*.

The symposium, held in 1976, was sponsored by the National Caries Program of the National Institute of Dental Research and organized in cooperation with the American Dental Association Health Foundation.

The purpose of the symposium was to evaluate existing information on the mechanisms of action of fluorides and to provide a basis for development of more effective fluoride regimens for the prevention of dental caries.

The proceedings encompass *in vivo* and physicochemical aspects of fluorides in caries inhibition and the biochemistry and microbiology of plaque fluoride. Specific assessments of these areas of research and recommendations for priorities of future research are also included.

A limited number of copies of this publication are available from Dr. Thomas C. O'Brien, Westwood Bldg., Room 522, Ext. 67884.

daily medication in some instances.

Q-switched lasers release as much as 10 million watts of energy in very quick bursts that cut a clean hole through tissues, while conventional lasers burn tissues with less intense energy and usually form scar tissue.

Q-switched lasers can thus produce new channels to drain the fluids normally produced in the eye. Glaucoma, one of the most common serious eye diseases, is caused by increased pressure that develops in the eye when these fluids cannot drain properly.

Investigators Check Pressure of Cheeks As Measurable Force in Shifting Teeth

Wind instrumentalists may find strong cheek muscles advantageous, but orthodontists find them a problem because these muscles can work to collapse the dental arch.

Dr. Sam Weinstein, professor of orthodontics at the University of Connecticut School of Dental Medicine, and Dr. Wallace W. Bowley, professor of mechanical engineering from the Storrs campus, have teamed up to measure cheek muscle forces.

The co-investigators, who have received a grant from the National

orthodontics at the University of Connecticut, are working to electronic recording equipment outside the mouth.

As the plunger moves in or out responding to changes in pressure from the cheek, its movements, as well as cheek forces, are displayed and recorded by the electronic equipment.

"This has to be sensitive," Dr. Weinstein noted, "because we are dealing with distances of only a few millimeters and forces of several grams per tooth. Forces placed on teeth by braces are much greater."

He pointed out that even a small force acting steadily over weeks and months can have a significant effect and must be considered by orthodontists.

"Even at rest," he added, "the cheek exerts about four to five grams of force against each tooth. This force increases as teeth are moved outward against the cheek."

In addition to forces, the team will also study some other characteristics of cheek muscles. For example:

Future Studies Outlined

Do the muscles tend to adjust and lose some of their inward pressure after an orthodontic appliance holds the cheeks outward for a period of time?

Do they increase their rate of tension in a uniform or nonuniform pattern?

How do they change with age and growth?

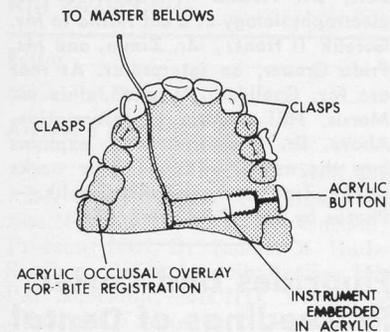


Diagram of the dental plate with its attachments which receive cheek pressures and transmit them via the tube to a recorder.

Institute of Dental Research to help support their study, are interested in providing information which will help orthodontists design appliances to reduce the forces that cheek muscles exert on teeth. These forces are strong enough to shift teeth to different positions.

Co-Workers Named

Working with them will be Dr. Thomas Gay, an associate professor of oral biology, and Dr. Raymond Vanderby, a research fellow in engineering.

As Dr. Weinstein explained in a recent interview: "In orthodontics we are always dealing with small forces because we use appliances to move teeth very short distances over time to improve bite or alignment.

Relapse May Occur

"Once the new, desired tooth position has been achieved," he observed, "we sometimes see a relapse with a tooth, or teeth, returning to the original location. Cheek pressures can help cause this in certain cases.

"We've known for a long time," Dr. Weinstein added, "that cheeks exert an inward force on teeth. Among the key questions are: How much and what levels of force are present as teeth are moved outward or inward, toward or away from the cheek?"

The team will use a unique device developed by Dr. Bowley to obtain exact information about the effects of cheek muscle forces.

It consists of a removable partial plate with a small plunger which can rest against the inside of the cheek. The appliance is connected

BONE EXPERTS

(Continued from Page 1)

Dr. Alvioli said, "We know that diet may play an important role in predisposing to the increased incidence of bone fractures in some people."

One of the aspects that makes the Bone Center so special is the development of simplified bone biopsy procedures which can be performed under local anesthesia.

Also, the center is one of the few places in the Nation studying the effects of cortisone on bone metabolism.

Another technique developed is use of the scanning electron microscope, which has proved most effective in delineating the actual structural defect in the bone collagen of children with an inherited disorder of bone known as osteogenesis imperfecta.

Studies Cause

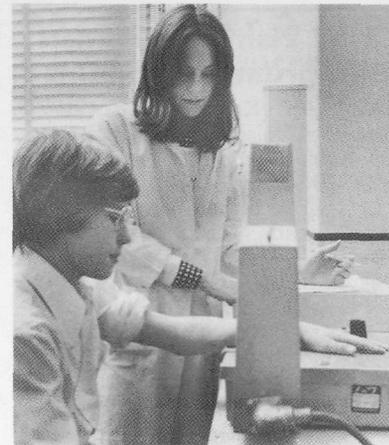
These studies were instrumental in detailing the specific cause for the many bone fractures experienced by these children.

The inevitable bone loss associated with chronic renal disease is another area in which the Bone Center has made some significant progress through development of a method of measuring parathyroid hormone levels in blood.

Research in this area has led to exciting new concepts regarding prevention of bone disease "by appropriate dietary manipulation . . . now being applied worldwide," according to Dr. Alvioli.

While tackling the major problems like renal osteodystrophy, there are occasional spin-offs which lead to discoveries in allied areas.

For instance, specialized techniques developed to look at vitamin



The Bone Mineral Analyzer passes a beam through the radial mid-shaft of the arm and measures the amount of mineral content in the bone.



Absorption of calcium from the patient's food is of prime consideration in dietary treatment of various bone diseases. The Tri-Carb Scintillation Spectrometer measures the calcium absorbed by the skeleton. Clinical researchers are delving into the relationship between vitamin D and bone loss.

D, calcium, and phosphate metabolism led to the development of assays which can be routinely applied to patients.

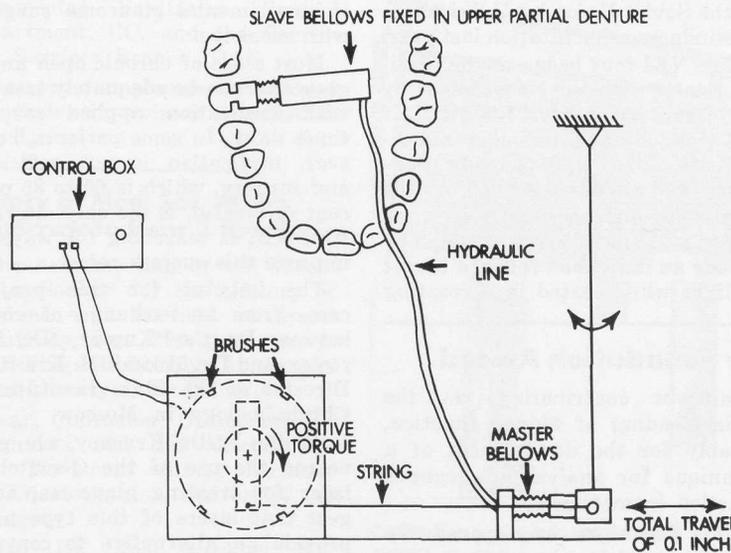
Another area of study is in treating Paget's disease, a bone disorder with an unknown cause which may affect over 10 percent of the geriatric population.

Hormone Evaluated

The hormone calcitonin, which comes from the thyroid gland and blocks bone resorption, was recently evaluated. When it proved capable of suppressing the bone disease without deleterious side effects, it was successfully administered to patients with the disease in a routine fashion.

A detailed article by Phyllis Hillinger about the Washington University School of Medicine Bone Center was recently published in their quarterly publication, *Outlook*.

A single free copy of a 7-page reprint describing the center, entitled *Bone Disease Study at the General Clinical Research Center*, is available at the Office of Science and Health Reports, DRR, NIH, Bethesda, Md. 20014.



USE: TIME VARYING CURRENT IS GENERATED IN CONTROL BOX EITHER BY MANUAL OR MECHANIZED INPUT. THIS CURRENT CONTROLS TORQUE MOTOR OUTPUT WHICH IN TURN PROVIDES A COMPRESSIVE FORCE ON MASTER BELLOWS.

Diagram showing how time-varying current is coordinated with cheek pressures transmitted from the mouth via hydraulic tube to master bellows.

Puerto Rico Scientists Report Progress Toward Immunizing for Schistosomiasis

Progress in immunization against schistosomiasis, an unconquered parasitic disease, has been reported by Dr. George V. Hillyer, head of a research group at the University of Puerto Rico.

Appearing in the December 1976 issue of *Federation Proceedings*, monthly publication of the Federation of American Societies for Experimental Biology, the report, *Can We Vaccinate Against Schistosomes?*, is one of eight scientific papers written by researchers of the Minority Biomedical Support Program, which is funded by the Division of Research Resources.

Parasites Cause Disease

Schistosomiasis is a disease of man and animals caused by blood flukes (parasitic worms) of the genus *Schistosoma*. The parasites causing human disease are found in the Orient (an estimated 200 million Chinese are infected), portions of Africa including The Nile, South America (especially Brazil), and some of the islands for the Caribbean.

Infectious Host Needed

It is estimated that 300,000 persons are infected in Puerto Rico. Infection does not occur in the U.S., but is present in the bloodstream of some immigrants entering the country.

It takes three to make a schistosomiasis infection—mammalian host, intermediary snail host, and the parasitic schistosome (a blood worm or fluke).

Transmitted by excretion, a schistosome egg passes through the intestine of an infected mammal into fresh water and hatches into a larval stage called a miracidium.

The miracidium infects a specific type of snail, and after several developmental changes in the snail, the parasite evolves into a fork-tailed larva or cercaria.

When the cercaria leaves the mollusk, it propels its way through the water in search of a mammalian host.

When it makes contact with a human being, it penetrates the skin and enters the body. The cercariae eventually turn into mature schistosomes which live in the blood-

stream. The parasites mature and mate, and the female lays its eggs.

The adult worms remain in the blood vessels surrounding the intestinal tract or urinary bladder, their eggs traveling through the bloodstream to various organs of the body, particularly the liver. The victim generally experiences itching, pain, weakness, and a shortened life span.

Re-infection Resisted

When animals and man are infected with schistosomes, they acquire immunologic resistance to re-infection. Apparently the cells produce a toxicity which is induced by an antigen.

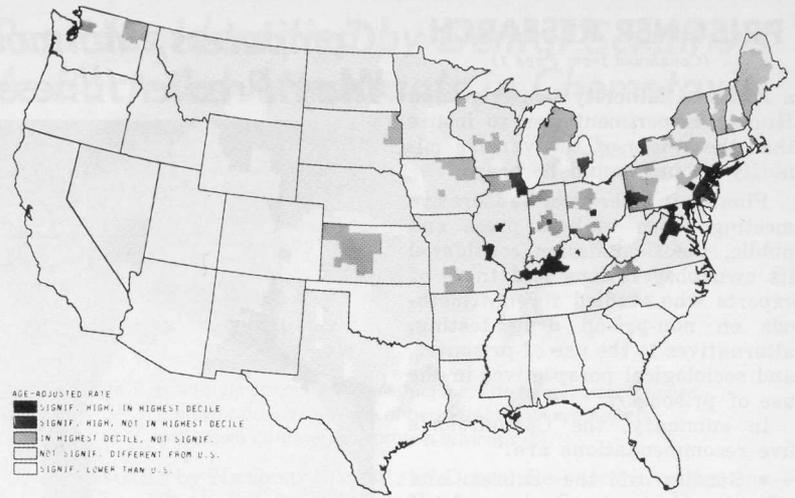
Dr. Hillyer's group has been conducting long-range studies on immunology induction in mice and hamsters before infection. In recent laboratory experiments, the researchers have found a complex of polyadenylic-polyuridylic acid (poly AU) to be a powerful stimulant of antibody production when inoculated into animals together with an antigen.

By use of *Fasciola* antigens (from another kind of fluke) combined with one injection of poly AU, the researchers achieved a 67 percent reduction in worm burden (schistosome infection) in mice. When two inoculations of poly AU were used, the worm burden reduction was 74 percent, according to Dr. Hillyer.

Antigens Prime Host

They also report that mice immunized with *Fasciola* antigens had 4-fold or higher titers of antibodies to schistosomes than mice infected with schistosomes but not immunized.

Concluding that *Fasciola* antigens prime the host to have a secondary reaction when infected with schistosomes, the Minority Biomedical Support group at the Uni-



Cancer Mortality, 1950-69, By State Economic Area Large Intestine, Except Rectum; Nonwhite Females

CANCER STUDY

(Continued from Page 1)

tabulations of deaths for 35 types of cancer compiled by the National Center for Health Statistics.

As with their previous publication, the NCI scientists believe the new *Atlas* should be used to identify U.S. communities or regions where investigations into possible environmental factors may prove most fruitful.

The similarity in geographic patterns of cancer for whites and nonwhites was particularly striking for cancers of the breast, colon, rectum, and esophagus, which showed generally high rates in the North and low rates in the South. Cancers of the larynx, bladder, and ovary also had above-average rates in the North.

Rates High in North

For lung cancer, both white and nonwhite males experienced high rates in northern areas and generally low rates in the South.

The pattern of high rates for white males along the Gulf and Southeast Atlantic coasts was much less pronounced among nonwhites.

Cancers of the uterine cervix had above-average rates primarily in rural areas of the South. Among nonwhites this reflects the higher

iversity of Puerto Rico is now attempting to purify the antigen(s) involved in this protection.

The researchers are optimistic that eventually a vaccine can be prepared which will give total protection against this parasitic disease now so prevalent in China, Africa, South America, and Puerto Rico.

"Eighty percent of all scientists since the beginning of time are alive today; relatively few are retired and 35 to 50 percent of all scientific research ever done is being conducted today." — Dr. Nathaniel Berlin, addressing Northwestern Univ. medical students.

cervical cancer risks of black women, the scientists indicated.

To compare cancer rates among whites and nonwhites — blacks, American Indians, Chinese, and Japanese—the NCI scientists also tabulated national death rates for each race.

Compared to other racial groups, blacks experienced high rates for cancers of the mouth and throat, esophagus, stomach, pancreas, larynx, lung, bladder and cervix, and multiple myeloma.

Racial Variations

American Indians experienced more cancers of the gallbladder, bile ducts and liver; Chinese had high rates for cancers of the nasopharynx (inner passages of the nose); and Japanese had increased stomach cancer rates.

Single copies of the *Atlas of Cancer Mortality Among U.S. Nonwhites: 1950-1969* are available free of charge from the NCI Office of Cancer Communications.

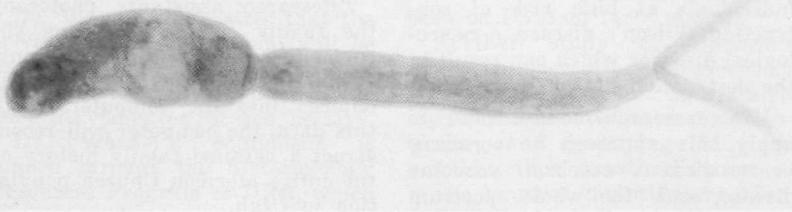
Searches on MEDLINE, World Requests Increase

The use of MEDLINE and the other on-line bibliographic retrieval services continues to grow. Searches are now being done at the rate of about 600,000 per year, and over 620 institutions are in the network.

New Partners Join

In the past year, Iran, Mexico, and South Africa have entered into partnership arrangements with the National Library of Medicine for MEDLARS/MEDLINE, joining eight other NLM partners: Australia, Canada, France, Germany, Japan, Sweden, the United Kingdom, and the World Health Organization.

Under the agreements, the foreign partners provide indexed citations for NLM's MEDLARS data base; in return they receive the MEDLARS computer tapes or direct on-line access to the Library's computers in Bethesda.



SKIN INVADER. Fork-tailed larvae (400 microns long) can penetrate the skin and eventually turn into mature schistosomes. DRR-supported researchers at the University of Puerto Rico are making progress in the effort to develop a vaccine against schistosomiasis—a parasitic disease affecting over 300,000 persons on the island.

PRISONER RESEARCH

(Continued from Page 1)

a National Minority Conference on Human Experimentation to insure that the voices of the various minority groups would be heard.

Finally, in a series of deliberative meetings open to both press and public, the Commission considered its own observations and those of experts who studied foreign methods on non-prison drug testing, alternatives to the use of prisoners, and sociological perspectives in the use of prisoners.

In summary, the Commission's five recommendations are:

- Studies of the causes and effects of imprisonment and of prison life may be conducted provided that the risks are minimal and do not seriously inconvenience the subject.

- Research may be conducted on new or accepted methods of diagnosis or treatment which are intended to improve the health or well-being of the individual prisoners and have a reasonable chance of success.

- Other types of research may not be conducted unless the research is found by the head of a responsible Federal department, in consultation with a national ethical review body, to fulfill an important social and scientific need. The reasons for involving prisoners must be compelling, and the conditions of imprisonment such as to insure a high degree of voluntariness on the part of the subject and openness on the part of the correctional institution.

- The investigators must in all instances be competent, the research facilities adequate, and the research subject to review by an institutional review board including among its members prisoners or prisoner advocates as well as meeting all other requirements for institutional review boards.

- Current research projects, subject to regulation by the Secretary of HEW, that cannot meet these requirements should be permitted to continue not longer than 1 year from the date of publication of the recommendations, or until completed, whichever is earlier.

Under the terms of the National Research Act, the Secretary must seek public comment on these regulations before either rejecting or implementing them within the next 180 days.

Every whisper of infamy is industriously circulated, every hint of suspicion eagerly improved, and every failure of conduct joyfully published by those whose interest it is that the eye and voice of the public should be employed on any rather than on themselves.—*Samuel Johnson.*

Computers, Mormon Genealogy Records May Predict Illness, Say Utah Scientists



Dr. Warner checks a computer printout in his office at University of Utah-affiliated Latter Day Saints Hospital, Salt Lake City. Funded by DRR, Dr. Warner is leading an effort which will computerize the genealogy records of the Mormon Church in Utah and link this information with medical records from throughout the state. Dr. Warner and his colleagues hope to determine if there are family relationships in certain types of cancer and other diseases, and if high risk individuals can be identified early.

Mormon Church genealogy records are being computerized at the University of Utah Medical Center in Salt Lake City to study the role family history may play in serious illness. Eventually, the information could help in the prevention and early detection of cancer and other diseases, according to Dr. Homer Warner of the University's Medical Biophysics and Computing Department.

Using a CDC 3300 computer funded by the Division of Research Resources, a group of investigators headed by Dr. Mark Skolnick, a population geneticist, will link the genealogy of 250,000 Mormon families with medical records to test several genetic hypotheses related to disease.

Data Base Is Unique

Dr. Warner, a Mormon church official, calls the genealogy records "a unique data base that makes up the most detailed family relationship records in the United States."

The Utah researchers, funded by a National Cancer Institute grant, will determine first whether cancer runs in families.

If a strong family relationship is confirmed, they will search for distinguishing traits of cancer-prone families.

Dr. Warner eventually hopes to find a relationship between certain genetic markers—such as fingerprints—and cancer.

He envisions quantifying these genetic markers for computer use so they can help identify high risk individuals within these families.

Dr. Warner explains that medical authorities now believe certain types of cancer run in families.

"If a family at risk can be identified, then it might be possible to identify individuals within that family who have traits corresponding to genes which might predispose them to cancer," he says.

Need Early Identification

"By identifying these people early, we can expose them to unusual detection efforts that would be cost-prohibitive to carry out for the entire population. With such thorough testing, we should be able to identify many lesions before they become malignant.

"We also can improve cancer prevention by counseling these people on environmental dangers—such as poor diet and smoking—which may trigger the start of cancer."

Dr. Skolnick already has used family relationships to determine individuals at high risk of contracting Wilson's disease, a neurological disorder which can result in the destruction of the liver.

Utah researchers also plan to apply this approach to coronary heart disease, cerebral vascular disease, and "the whole spectrum of illness."

Now, however, the study is concentrating on translating the Mormon Church genealogy records into computer usable language.

Latest Guidebook Offers Revised Exchange Lists To Plan Nutritious Meals

Single copies of the updated *Exchange Lists for Meal Planning*—a publication long familiar to persons with diabetes—are available from the Office of Scientific and Technical Reports, National Institute of Arthritis, Metabolism, and Digestive Diseases.

The colorful revised 24-page guidebook reflects current thinking in nutrition education. Essential for diabetic patients, it is of interest to anyone concerned about weight control, good health, and prevention of heart disease.

The new lists are concerned with total calorie intake as well as modification of fat intake, and they count all calories in the meal plan.

Some Are Unchanged

Major changes over previous editions are in the milk, vegetable, bread, meat, and fat lists, but the fruit list is unchanged.

The six lists are specific groups of measured food items, which contain the same amount of calories, carbohydrate, protein and fat, and similar amounts of minerals and vitamins.

Substitutes Variety

Food items within any one group may be substituted for others within the same group to add variety to meal planning.

The guidebook emphasizes that it must be used only with the consultation of a diet counselor, who may be a registered dietitian, physician, or teaching nurse.

The bicentennial edition of the exchange booklet was prepared jointly by committees of the American Diabetes Association, American Dietetic Association, NIAMDD, and the National Heart, Lung, and Blood Institute.

Copies in quantity may be purchased from the American Diabetes Association or any of the Association's many chapters.

"Each Mormon is encouraged by the church to fill out a four-generation family chart which is kept by the Genealogical Society in the Mormon Church Office Building here in Salt Lake City," Dr. Warner explains.

Assistants Photo Copy

"Research assistants photocopy the family charts and bring the copies to nearby Latter Day Saints Hospital where the information is entered into the computer. With this data, the computer will reconstruct a detailed family history of the entire Mormon Church population in Utah.

"We hope to link this history to hospital medical records, death records, and the state's cancer registry to gain an insight into the

(Continued on Page 7)

Scientists Find New Synthetic Hormone Prevents Hereditary Angioedema by Correcting Biochemistry

NIH scientists have shown that a new synthetic hormone, Danazol, prevents potentially life-threatening attacks of hereditary angioedema (HAE). In addition, the National Institute of Allergy and Infectious Diseases and the National Institute of Child Health and Human Development investigators have found that the drug acts to correct the inherited biochemical abnormality believed to cause the disease.

Hereditary angioedema is a rare but serious condition characterized by episodes of swelling of the hands, feet, face, or airway passages and recurrent abdominal pain.

Can Cause Death

Although these attacks can occur without provocation, anxiety, stress, or minor trauma—such as dental work—have been associated with an increased incidence of attacks. Deaths due to HAE—usually caused by airway obstruction—have been reported to be as high as 30 percent.

Lacking effective means of stopping an attack once it starts, patients with HAE have relied on long-term use of various drugs to prevent the attacks.

However, these agents can produce serious side effects, thus limiting their usefulness. In addition, the prolonged use of one class of these drugs—androgens—by women with HAE can result in masculinization.

The NIH researchers, therefore, decided to study the effectiveness of a new androgen, Danazol, which has a reduced potential for producing masculinization. Five young

women and four men who had a history of one or more HAE attacks each month received randomized courses of either Danazol or a placebo.

Each course lasted 28 days, unless an attack occurred. A new course was begun either after successful completion of a 28-day course, or after an attack subsided. Neither the physicians nor the patients knew when a patient was taking Danazol or a placebo.

Side Effects Are Few

During 46 Danazol courses completed by the nine patients, only one HAE attack occurred. Side effects of the drug were minimal: some weight gain in all patients, and menstrual irregularity in the women. However, the hormone did not produce virilization of the women nor affect the sexual potency of the men.

In sharp contrast, during the 47 courses of placebo in the same patients, 44 HAE attacks occurred.

In addition, the Bethesda researchers found that Danazol reversed the biochemical defect thought to be the cause of HAE—low amount and diminished activity of a protein which inhibits the first component of complement (a series of interacting serum proteins involved in immune responses).

While on Danazol, the amount and activity of this inhibitor protein in these patients climbed to almost normal levels.

One patient, who discontinued Danazol, after 60 days experienced a decrease in the level of this protein until she resumed taking Danazol.

The scientists hope that any possible side effects of long term use of Danazol might be offset by lower dosages. Most of the patients—all of whom have chosen to remain on Danazol—have been able to decrease their daily dosages.

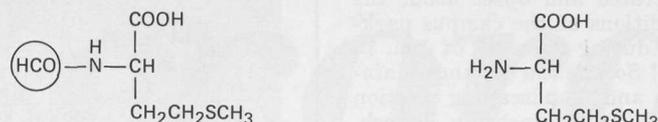
No Toxicity Seen

No further toxicity has been seen even in those patients who have been on Danazol for 6 months.

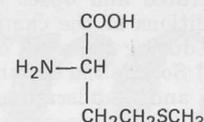
Further study of Danazol's action in hereditary angioedema may provide a greater understanding of the underlying factors controlling and modifying this, and possibly other, genetic diseases.

The team of investigators—Drs. Jeffrey Gelfand, David Alling, and Michael Frank of NIAID, and Dr. Richard Sherins of NICHD—reported their study in the Dec. 23, 1976 issue of *The New England Journal of Medicine*.

Peptides Identified by Dental Scientists As Bacterial Attractants in Chemotaxis



a.



b.

Figure 1. N-formylmethionine and methionine. The formyl group (circled) is present during initiation of bacterial protein synthesis (a) and absent during animal protein synthesis (b).

Recent studies by National Institute of Dental Research investigators—including Dr. Elliott Schiffmann, Ms. Barbara A. Corcoran, Dr. Sharon M. Wahl, and Dr. A. Aswanikumar—have clarified how white cells in the blood detect a bacterial infection and migrate to the area. Once in the area, the white cells engulf and eliminate the invading organism.

Earlier studies showed that the bacteria produced something that attracted the cells. In cells, detection of a chemical is often linked to movement of the cell to the source of the chemical—a process known as chemotaxis.

Attempts to identify a specific attractant produced by bacteria were unsuccessful because it occurs in extremely small amounts and appears to be a mixture of peptides which are fragments of proteins.

Knowing that bacteria synthesize proteins with formylmethionine as the initiating chemical whereas all higher forms of life use methionine for this purpose, (Fig. 1) the investigators reasoned that perhaps peptides containing formylmethionine might be attractants because they would obviously be foreign to animal cells.

Therefore, the scientists synthesized a number of formylmethionine peptides and tested them for chemotactic activity. As shown in Fig. 2, white cells position themselves in response to a streak of attractant laid in front of them.

Now many peptides have been

prepared, some extremely potent at 10^{-12}M and others inactive or even inhibitory. The team's studies have provided evidence for the following sequence of events:

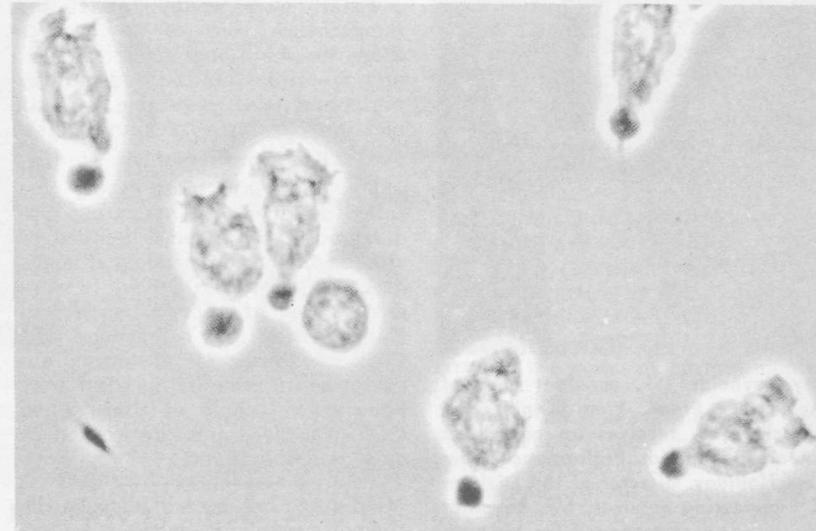
- 1) reaction of peptide with cell membrane,
- 2) activation of the cell and
- 3) cleavage of the bound peptide.

This last step frees the cell to react with other molecules and detect the level of attractants.

The synthetic compounds have been shown to activate each of the four major phagocytic cells involved in fighting bacterial infections, and to cause the release of histamine and other biologically active substances.

Since the compounds are active *in vivo*, they are being tested as stimulants of wound healing and as infection-combating substances. Inhibitory compounds are being examined for their ability to suppress local inflammatory reactions.

Organisms other than man appear to use formylmethionyl peptides to detect bacteria. Interestingly, these include such species as slime molds, which eat bacteria, and thus may represent an ancient and general adaptation.



White cells on a glass cover slip migrate toward a chemical attractant just beyond the top of the picture, dragging circular "tails" behind them. Photo, courtesy of Dr. Sally Zigmond, department of biology, University of Pa.

MORMONS

(Continued from Page 6)

role genetics plays in cancer etiology

"From here, it should be possible to search the medical file for all patients having any particular disease and then locate these same patients in the genealogical files to determine interrelationships.

"This will provide an invaluable resource for genetic research, not only for investigators at this institution, but all over the world."

The Utah team has been cataloging the genealogy files for more than 2 years. In another year, the investigators hope to begin linking the family history information with the medical data.

Dr. Warner emphasizes that the privacy of each individual will be scrupulously protected. It will be impossible to identify actual people from the computer records, he says.

Dr. Warner's equipment is funded through the Biotechnology Resources Program of DRR, which conceives, develops, and assures the availability of resources that concentrate on the application of the physical sciences, mathematics, and engineering to biology and medicine.

Snow and Ice Frustrate Grounds, Other Workers

Frustrated and upset about the icy conditions of the campus parking lots during the week of Jan. 10 thru 14? So was the Grounds Maintenance and Landscaping Section of the Plant Engineering Branch, DES.

GML, responsible for the snow and ice control program for NIH, took "several" calls from employees who could not understand why the parking lots were not clear when they came to work on Tuesday, Jan. 11 after a full day and night of no snow.

Thomas Cook, chief of GML, explains that when the snow and sleet stopped at 4 a.m. on Monday there was not sufficient time to plow the lots before normal working hours, and areas that were plowed continued to get freezing rain, creating extremely hazardous conditions.

Hope Sand Works

It was therefore decided to sand the 1 inch-plus of rain-soaked snow in the parking spaces (a 3-hour operation) and hope the temperature would rise enough to melt it.

But the temperature rose only enough during the day to thaw the top, smooth it out, absorb the sand, and then freeze again that night. Further plowing of parking spaces was virtually impossible because of the cars during the day and the frozen conditions at night.

Parking lot travel lanes and spaces were sanded each morning (between 4 a.m. and 7:30 a.m.) and salt was applied where possible at times when the temperature rose above 24 degrees (the required temperature for salt to work).



Roy Reynolds (r), assistant head of the Utility Plant, Plant Engineering Branch, DES, receives an award for Sustained Superior Performance from Ross Holliday, director of the Division of Engineering Services. Mr. Reynolds was recently commended for his outstanding initiative and major contributions to the management of the NIH physical plant.

Smile, America!



National Children's Dental Health Week

Feb. 6-12

To keep on the right track
to dental health

1. Every day, eat foods from these groups—milk, meat, fruits and vegetables, breads and cereals.
2. Stay away from sugary snacks—gum, candy, cakes, cookies, and soft drinks.
3. Brush and floss your teeth each day.
4. Have regular dental checkups.

National High Blood Pressure Program Report Emphasizes Detection, Treatment

A recent report of the National High Blood Pressure Education Program marks "the first time this country's medical associations and authorities have reached a consensus on an approach to diagnosis and treatment of high blood pressure," according to Dr. Robert I. Levy, Director of the National Heart, Lung, and Blood Institute.

The Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure underlines agreement over

when and/or what treatment is appropriate for high blood pressure. Dr. Levy noted that it provides a cost-effective, practical basis for addressing a health problem that is estimated to affect 23 million or more Americans.

The report emphasizes that early detection of high blood pressure is only part of the problem and that getting a person to begin and maintain proper treatment represents perhaps an even greater challenge. Screening efforts should continue, says the report, but if all physicians regardless of specialty, as well as dentists and other medical specialists, would measure blood pressures routinely, the need for mass screening efforts would greatly decrease.

Similar Problems Everywhere

Mr. Cook says most people who called reported icy areas but understood the problems because of similar difficulties they had at home.

A few, however, called to suggest a lack of effort when everything possible was being done. Mr. Cook apologizes for the short answers he or some of his staff may have given people at times when GML was tired and had worked 24 to 36 hours straight.

Middle age has been said to be the time of a man's life when, if he has two choices for an evening, he takes the one that gets him home earlier.

—Alvan L. Barach

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The report recommends that:

- Virtually anyone with a diastolic pressure of 105 mmHg or more should be treated with anti-hypertensive drugs.
- Drug treatment may or may not be appropriate for persons with diastolic pressures between 90-104 mmHg.
- Only a few, limited tests are needed to evaluate properly most people with high blood pressure and that hospitalization is rarely needed.
- A simple, "stepped-care" approach to drug treatment should be used.

The report describes dosages,

side effects, and contraindications for antihypertensive medications including propranolol, a drug recently approved for the treatment of hypertension by the Food and Drug Administration.

The report was endorsed by the High Blood Pressure Coordinating Committee composed of major medical organizations who act in a mutually advisory and coordinating capacity to the National High Blood Pressure Education Program (NHBPEP).

The report was published in the Jan. 17 issue of the *Journal of the American Medical Association*. Copies will also be available from the High Blood Pressure Information Center, 120/80 National Institutes of Health, Bethesda, Md. 20014.

The report describes dosages,

☆ U.S. GOVERNMENT PRINTING OFFICE: 1977—241-163/7

1st Annual Geigy Award Presented to 4 NIH'ers, 2 Indiana Collaborators

Four scientists from the National Institute of Neurological and Communicative Disorders and Stroke's Epilepsy Branch and two collaborators at the New Castle State Hospital, New Castle, Ind., have won the first annual \$1,000 Geigy Award for the best published controlled trial of an antiepileptic drug.

The award, sponsored by the Commission on Antiepileptic Drugs of the International League Against Epilepsy, was given for the article, Carbamazepine for Epilepsy: A Controlled Prospective Evaluation, published in *Neurology* (24:401, 1974).

Authors Listed

The authors are Dr. James Cereghino, Dr. J. Kiffin Penry, Lawrence Smith, and Bill White of NINCDS, Dr. Joseph Brock and John Van Meter of the State Hospital.

The study, performed at the New Castle State Hospital, was supported in part by NIH.

This year's prize—given for controlled trials published before Jan. 1, 1976—was awarded for superior study design, acquisition of quantitative data, statistical controls, and consideration for human rights.

Youth Advocacy Volunteers Needed to Assist Adolescents

Youth Advocacy volunteers are being asked to share their interests with adolescents needing extra understanding and encouragement.

A few hours each week of a volunteer's time can make a lifetime of difference to a troubled youth.

Volunteers to become a Youth Advocate must apply by Feb. 2; training begins Feb. 9.

To obtain an application and for more information, call the Mental Health Association of Montgomery County at 949-1255.

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