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PUBLIC HEALTH SERVICE
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Program Revised, Category Added, Guidelines Set

The NIH intramural program for visiting scientists has been revised and renamed the Visiting Program, following its reappraisal in the light of changing research needs and concepts.

Significant changes embodied in the revision include:

- Establishment of general guidelines limiting the growth of the program.

- Addition of a "Visiting Fellow" category, essentially for the training of recent postgraduates.

- Redefinition of the two previous categories, now termed "Visiting Associate" and "Visiting Scientist."

- Establishment of groups constituting review boards for each of the three categories.

Nominations for appointment will be initiated by the Institute, rather than the individual.

The revision was approved by Dr. Shannon on January 26. No announcement of the program is (See PROGRAM, Page 2)

World Flu Specialists To Meet at NIH; 400 Expected

Approximately 400 virologists, epidemiologists, clinicians, and other specialists in influenza will participate in the International Symposium on Asian Influenza, to be held at NIH Wednesday through Friday of this week.

All sessions will be held in the CC auditorium. PHS Surgeon General Burney will be the first speaker at the Friday sessions, dealing with "The Role of Health Organizations in the Future."

The symposium is jointly sponsored by NIAID and the University of Southern California School of Medicine. Dr. Clayton G. Loosli, Dean of the U.S.C. School of Medicine, is Chairman of the Conference Committee.

The symposium will enable scientists of the U.S. and other countries to exchange information about the 1957 Asian flu outbreak and other pandemics.

Countries to be represented at the conference include England, Canada, Switzerland, Japan, Holland, and the U.S.S.R.

SCIENCE WRITERS PARTICIPATE IN PANEL



Participants in a recent panel discussion of NIH information practices exchange news-gathering anecdotes with Jack Fletcher, Chief, ORI. Left to right: Science Writers Mike O'Neill, of Medical News and the New York Daily News, and Nate Haseltine, of the Washington Post; Mr. Fletcher; Bert Ivry, Washington News Editor, National Broadcasting Co.; and Hugh Jackson, NIAMD Information Officer. The panel session, fourth in a series of special programs for information officers, was attended by information and other staff members. The meeting was arranged by Mr. Jackson.

Budget Hearings Begin This Week; \$400 Million Requested for 1961

Dr. Shannon, Institute Directors, and other immediate staff this week will begin testifying before the House of Representatives Subcommittee of the Committee on Appropriations in support of the NIH budget request for Fiscal Year 1961.

The request is for \$400 million, exclusive of \$25 million for research facilities construction grants. The NIH total is a part of the Public Health Service request for \$765 million, included in the President's request for \$3½ billion for the Department of Health, Education, and Welfare.

Retirement Recalls Pioneering Days

The retirement of Harley G. Sargent, research technician at the NIAID Rocky Mountain Laboratory, Hamilton, Mont., serves as a reminder of the rapid growth of the nation and its medical research facilities.

Born 65 years ago in Seward, Neb., Mr. Sargent at the age of two journeyed with his family by wagon train to the Bitterroot Valley of Montana.

Thirty-three years ago, when he joined the RML staff, it was located in an abandoned schoolhouse in the town of Canyon Creek. Within that span of little more than three decades, he has seen the Laboratory expand to its present modern and extensive quarters on the outskirts of Hamilton.

In the days when RML was working to conquer Rocky Mountain spotted fever, its scientists needed millions of infected ticks

(See RETIREMENT, Page 2)

Job Opportunities Open for Stenos, Typists

The NIH Recruitment and Placement Section, Rm. 21, Bldg. 1, is anxious to interview persons who have passed the new Civil Service examinations for typist and stenographic positions.

Qualified applicants are being considered for full-time positions in Bethesda and Silver Spring. A few part-time positions are also

available for persons who are able to work at least six hours per day.

Applicants who have not passed the Civil Service examination since November, 1959, may take the examination without appointment at 8:45 a.m., Monday through Friday, in Building 15-K. For further information about these positions, call Ext. 2404.

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Susan Jennings (right), a new employee in NCI, gets first-hand information about the NIH reservation from Chris A. Hansen, Chief, DRS, and Ronald J. Harron, Research Facilities Planning Branch, DRS. The three-dimensional model of the reservation, on display in the Bg. 1 lobby was recently brought up to date to include models of the new buildings now under construction.

NIH Medical Board Appointed for 1960

The NIH Medical Board for calendar year 1960 was appointed last month by Dr. Shannon.

Representing the medical staff, the Medical Board is responsible for developing policies governing standards of medical care in the Clinical Center. All actions of the Board are advisory to the Director, and when approved by him are made operating policies of the CC.

Under the chairmanship of Dr.

Joseph E. Rall, NIAMD, the Board is made up of the following members: Drs. Robert W. Berliner, NHI; Edward J. Driscoll, NIDR; Vernon Knight, NIAID; William C. Jenkins, NIMH; G. Milton Shy, NINDB; Joseph J. Bunim, NIAMD; Robert R. Smith, Louis B. Thomas, and Charles G. Zubrod, NCI; Gilbert R. Christenson, Robert M. Farrier, Theodore F. Hilbush, Jack Masur, and George Z. Williams, CC.

NIAID Members Attend Seminar at Berkeley

Eight NIAID staff members attended a three-day seminar at the University of California at Berkeley, February 1-3, to discuss in closed session the subject of animal cells and viruses.

Participants from the Laboratory of Cell Biology were Dr. Harry Eagle, Chief; Dr. James E. Darnell, Dr. Leon Levintow, Dr. Norman P. Salzman, and Dr. Wolfgang Joklik. Dr. Joklik is a Research Fellow from the John Curtin School of Medical Research, Australian National University, Canberra.

Also in attendance were Dr. Karl Habel, Chief of the Laboratory of Biology of Viruses, and Dr. Victor H. Haas of his staff.

Dr. Bill H. Hoyer of the Rocky Mountain Laboratory, Hamilton, Mont., also contributed to the sessions.

BUDGET

(Continued from Page 1)

Following is a breakdown of the request for appropriations:

Appropriation	(Millions)
NCI	\$ 88.9
NIMH	67.6
NHI	63.2
NIDR	11.0
NIAMD	47.5
NIAID	34.7
NINDB	39.7
GR&S	47.2
Total	\$400.0*

* Exclusive of construction

The House Subcommittee is headed by Rep. John E. Fogarty of Rhode Island. Other members of the Subcommittee are Winfield K. Denton, Indiana; Fred Marshall, Minnesota; Melvin R. Laird, Wisconsin; and Elford A. Cederberg, Michigan.

PROGRAM

(Continued from Page 1)

anticipated outside of NIH.

The fundamental purpose and spirit of the program are:

1. To broaden the utility of the physical facilities and the intellectual environment of the NIH as a national research resource; and
2. Within limits, to strengthen the mutually productive scientific relationships between similar centers throughout the world with that part of the scientific community represented by the NIH.

Dr. Ronald E. Scantlebury, Chief, Foreign Grants and Awards, is also Chief of the Visiting Program. Both programs are administratively within DRG.

A brochure explaining in detail all essential features of the Visiting Program can be obtained from Dr. Scantlebury's office, Building T-18, Room 112, Ext. 4335.

NIMH to Publish Research Journal

The *Journal of Psychiatric Research* is being established here, with Dr. Seymour S. Kety, Chief, Laboratory of Clinical Science, NIMH, as editor-in-chief. Associate editors are Drs. Joel Elkes, Chief of the Clinical Neuropharmacology Research Center, NIMH, and David A. Hamburg, Chief of the Adult Psychiatry Branch, NIMH.

The editors hope to obtain contributions relevant to psychiatric problems from a variety of sources in order to meet a need for the publication of research of high quality in the field of mental illness and mental health.

They will welcome original research reports of a theoretical nature, speculative but heuristic contributions, and constructive critical reviews in important areas.

Contributions may include studies of clinical application as well as research in processes basic to an understanding of the nervous system and of behavior.

The Journal will be issued quarterly. Members of the editorial board of 30 persons include scientists from England, Canada, and the United States.

Briton to Speak at Reed

Gen. Leonard D. Heaton, Surgeon General of the Army, has issued an invitation to the NIH staff to attend the third in the 1959-1960 series of medical meetings, to be held at 8 p.m., February 18, in Sternberg auditorium at the Walter Reed Army Medical Center.

The principal speaker will be Lt. Gen. Sir Alexander Drummond, Director General of Army Medical Service of Great Britain, who will discuss military medical problems in Great Britain today.

RETIREMENT

(Continued from Page 1)

for the manufacture of spotted fever vaccine.

Mr. Sargent specialized in the collection of ticks and animals in the field, and in rearing ticks in the laboratory. His knowledge of their habits enabled him to discover several species of ticks and to provide new information about known species.

On a field assignment last summer, Mr. Sargent spent his 65th birthday in that area of the Bitterroot Valley to which he had emigrated in the summer of 1896. His retirement was effective February 1.

Mr. and Mrs. Sargent plan to remain in Hamilton "to enjoy the beauty of the Bitterroot." And he hopes to spend some time hunting and fishing and riding the mountain trails that surround the valley.

Science Section

This four-page section, devoted chiefly to summaries of research findings that have been reported by scientists of the National Institutes of Health, is prepared with the cooperation of the Information Offices of the Institutes and Divisions of the National Institutes of Health.

Studies of Hemoglobin Provide New Data On Oxygenation

Basic research at the National Institute of Arthritis and Metabolic Diseases is leading to a clear understanding of how heavy metals are bound to human hemoglobin. The research has important implications for understanding of the oxygenation process since the mechanisms governing heavy metal binding are believed to be similar to those governing oxygen binding.

One of the most vital of all physiological processes is the binding of oxygen by hemoglobin, a process which enables red blood cells to transport oxygen throughout the circulation. Basic studies of human hemoglobin, by Dr. Makio Murayama of the Laboratory of Pathology and Histochemistry of the National Institute of Arthritis and Metabolic Diseases, have now provided valuable new information about the mechanisms of this complex binding process. The studies were reported in the *Journal of Biological Chemistry*.

Heavy Metals Significant

The objective of the NIAMD research was to study the way in which hemoglobin binds heavy metals, such as mercury, arsenic and copper. The binding takes place at eight heavy metal-binding sites on each of the hemoglobin molecules, and the mechanisms of this type of binding are believed to be analogous to those of oxygen binding, which takes place at four other binding sites on the hemoglobin molecule. Thus, a full understanding of heavy metal binding can help to explain the oxygenation process.

Heavy metal binding and oxygen binding can be looked upon as two sides of the same coin, since the binding sites are all close together in the molecule and influence one another.

Dr. Murayama's study of the eight heavy metal-binding sites has revealed that a cooperative interaction takes place among them. That is, once the first heavy metal ion attaches to a binding site, it becomes progressively easier for succeeding metal ions to attach to the remaining sites. The binding sites are inside the molecule rather than on its surface, and the process can be visualized as a "wedging

Techniques for Study Of Brain Physiology Devised by NIMH

New techniques for studying brain physiology have been devised by scientists in National Institute of Mental Health's Laboratory of Neurophysiology and reported at the American Physiological Society meetings.

F. J. Brinley and Dr. E. R. Kandel have devised a very useful method of doing tracer work on the cerebral cortex. This method appears to be applicable to many chemicals but has so far been used only for K^{42} . The K^{42} is transferred into the cortex through the arachnoid-pia membrane system. The rate of release of the K^{42} is then followed as a function of various chemical agents or spreading cortical depression.

It has been found, significantly, that gamma amino butyric acid causes only a small transient increase in K outflux. This strongly suggests that this drug does not act by depolarizing dendrites. It has also been observed that the surface negative phase of spreading cortical depression is accompanied by a very similarly shaped wave of K ion outflux from the cortex.

Dr. Felix Strumwasser has found that single cells can be excited extracellularly and has made an extensive study of this in frog brain. The stimulus is delivered through the recording electrode. This method permits identification of otherwise silent cells and gives previously unavailable information about the excitability characteristics of the cells.

apart" of the hemoglobin molecule.

As the wedging increases it becomes easier for additional metal ions to get inside the hemoglobin molecule, attach to its binding sites, and increase the wedging effect. This type of cooperative interaction is also known to exist at the four oxygen-binding sites.

At the heavy metal sites the interactions are known as mercapto-mercapto interactions (mercury-capturing interactions), and at the oxygen sites they are known as heme-heme interactions.

The NIAMD scientist has been able to determine the physical "constants" that govern the mercapto-mercapto interactions and,

Bone Changes Resulting from Acute Leukemia Described

The bony changes resulting from acute leukemia, with direct correlation between X-ray findings and histological abnormalities, have been described in a collaborative study by National Cancer Institute scientists and investigators of the Clinical Center's Diagnostic X-Ray Department. Their results, which were published in a recent issue of the *AMA Archives of Internal Medicine*, formed the basis of an exhibit that was shown at the 107th meeting of the American Medical Association.

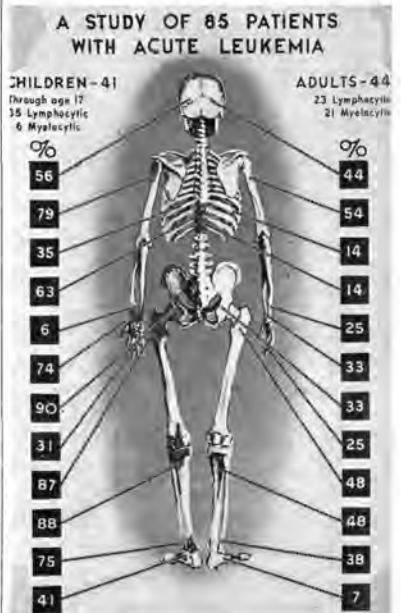
The findings showed multiple areas of bone destruction, radiolucent bands, particularly in children, some new bone formation, heavy leukemic infiltration. Growth lines were often demonstrated in patients experiencing periods of remission following antileukemic therapy.

This work was summarized by Drs. Theodore F. Hilbush, Byron E. Besse, Jr., Lee B. Lusted, and Marvin L. Daves of the Diagnostic X-ray Department; Louis B. Thomas, Pathologic Anatomy Branch, NCI; and Claude E. Forkner, Jr., General Medicine Branch, NCI.

Section through knee joint showing diffuse osteoporosis, irregular cortical destruction, acute infarct of tibia, destruction of articular cartilage, and hemorrhagic leukemic infiltrate in joint capsule.



X-ray from a four-year-old girl with myelogenous leukemia, showing periosteal new bone formation (arrow), small areas of bone destruction, and radiolucent bands under heavily calcified epiphysis.



Distribution of skeletal changes in patients with acute leukemia.

for the first time, measure the degree of interaction. Such measurements provide a most useful adjunct to studies of oxygenation mechanisms.

The present study also suggests an interesting approach to the treatment of sickle cell disease, a disease caused by an abnormal type of hemoglobin known as S hemoglobin.

Molecules of S hemoglobin have an abnormal shape; when they are not carrying oxygen they appear to "stack up" inside the red blood cell, and the cell becomes twisted into its characteristic sickle shape. Such sickle shaped cells seriously impair blood flow in the capillary

network and account for the pathology of the disease.

The apparent stacking does not occur as long as S hemoglobin molecules are wedged apart, either by oxygen molecules or by heavy metal ions, so that sickling could be prevented if heavy metals were kept bound to the hemoglobin.

Unfortunately, the heavy metals are too toxic for this purpose. What is needed, therefore, is some innocuous material that would attach to the heavy metal-binding sites and keep the S hemoglobin molecule wedged apart.

Studies are being continued in an attempt to find a material that might accomplish this purpose.

Progress Shown in Research On Cell Culture Biosynthesis

Dr. Harry Eagle, Chief, Laboratory of Cell Biology, National Institute of Allergy and Infectious Diseases, last week (Feb. 9) delivered the National Institutes of Health Lecture on Biosynthesis in Human Cell Cultures. He recently summarized progress in research on the metabolism of amino acids in mammalian cell culture in an article in Science. Most of the extensive data presented in the publication, and only partially represented here, is derived from NIAID studies.

A number of cell lines from normal and malignant tissues have now been serially propagated. Cells and medium can be separately analyzed, balance experiments set up, metabolic processes examined, and corresponding enzymatic activities explored in cell-free extracts.

While eight amino acids suffice for nitrogen balance in man (Rose), every cell culture so far examined has required at least thirteen for survival and growth. Several possible explanations may be advanced. Experiments with fresh first culture passage monkey kidney cells have shown that this additional requirement is not due to loss of biosynthesis mechanisms in the course of prolonged growth; but Dr. Eagle points out that these experiments do not exclude the possibility that the necessary enzymes are lost from the cells within the first few hours after their removal from the animal. Cells in culture have a rapid growth characteristic which might outpace capacity for biosynthesis of the additionally needed nutrients.

Synthesis Capacity Limited

Although glutamic acid at physiological levels usually does not substitute for glutamine in these cell cultures, cells do have a limited capacity to synthesize glutamine. As shown by DeMars, the amount of glutamine-synthesizing enzyme is greatly enhanced by adaptation to high levels of glutamic acid, after which the cells can grow at low levels of glutamic acid for long periods and perhaps indefinitely. As an exception to the general rule, monkey kidney cells in primary passage can use glutamic acid or glutamine interchangeably; and these cultures contain increased amounts of glutamine synthase.

Along with glutamine, arginine, histidine and tyrosine cultured cells rigorously require cyst(e)ine. The report in *Science* draws data from a paper in preparation (Eagle, Oyama, Piez, Fleischman) in demonstrating that cultures human cells have several sources for the provision of cyst(e)ine. One of these is *de novo* synthesis. Cystine is one of 3 compounds (inositol and pyruvate are the others) which are required by certain cells despite the fact that they can be synthesized in amounts which should suffice for growth.

Another major source for the provision of cystine in cell cultures is the release from the serum protein of the medium of half-cystine residues which are bound to -SH groups, and which can be dissociated by a number of reducing sulfur compounds.

The biosynthesis of the "non-essential" amino acids is also under investigation by the NIAID Laboratory of Cell Biology. The specific source of the alpha-amino nitrogen of the 8 nutritionally non-essential amino acids is one of the facets now under study, as well as their metabolic interrelationships.

Serine Loss Major Factor

Small cell populations have been found to have special nutritional requirements. The major factor involved in the anomalous requirement for a non-essential amino acid, serine, by small cell populations is the loss of serine from the cell pool into the medium at a rate which exceeds the biosynthetic capacity of the cell.

Dr. Eagle further discusses the amino acid pool. All cultured human cells thus far examined concentrate amino acids from the medium. The composition of the pool in culture is essentially similar to that in animal tissues. Glutathione, taurine, glutamine, ammonia, and glutamic acid are present in largest amounts and together constitute approximately 60 percent of the total pool amino acids. It has been possible to determine for a number of specific amino acids the average intracellular concentrations necessary for the initiation of protein synthesis and cell growth.

Serum Protein Provides Compound

The serum protein which is necessary for the growth of most human and animal cells, over and above the 28 defined growth factors, is not itself used as an important source of amino acids. Studies now in press have shown that the protein can actually be dispensed with, and that its primary function is the provision of small molecular weight compounds either bound to the protein or formed by its degradation.

Although the basal medium has been employed successfully for the cultivation of cells directly from the animal host, there is no information as to the proportion



An NIAID scientist uses a scintillation counter to trace nutrient material which has been made radioactive and fed to living cells.

of cells which grow out, or as to the additional growth factors which would be required for maximally efficient cloning. Until such cloning can be achieved with essentially 100 percent efficiency, the identification of cell cultures, as for example, "liver," "lung," or "bone marrow" is suspect. Dr. Eagle further notes that specialized organ functions are conspicuously absent in almost all serially propagated dispersed cell cultures. It remains to be determined whether this reflects incorrect identification of the cells, an irreversible loss of their biosynthetic capacities, absence from the environment of necessary precursors or cofactors, or the fact that cellular organization and interaction are essential to those specialized functions.

Amino Acids Important

An understanding of metabolism of essential amino acids and of protein turnover in the cultured cell, outlined in the *Science* report, has permitted studies of the role of amino acids in the biosynthesis of poliovirus. Dr. Eagle relates data from several papers in press or recently published by his colleagues in the Laboratory of Cell Biology which describe progress in this area.

An early study left open the question as to whether the viral protein was formed from the amino acid pool of the cell, whether the cells utilized their own protein for viral synthesis, or whether these two possibilities were the same, in the sense that cell protein turnover could supply the free amino acids. Recent observations indicate that the synthesis of poliovirus by the HeLa cell requires the presence of a full complement of amino acids in the pool.

In contrast to the results obtained in large cell populations, when a relatively small number of cells were placed in a large volume

Tumor Growth Rate Related to Intake Of Sodium Ion

Previous studies by scientists of the National Cancer Institute's Laboratory of Physiology have shown that tumor-bearing rats fed a diet containing lyophilized tumor tissue consume more food and water, gain more weight, and produce larger tumors than do rats receiving casein.

Dr. Julius White and his associates have now reported that the growth stimulatory properties of Walker carcinosarcoma 256 tissue are shown also by the water-soluble fraction prepared from it, and that the factor principally responsible for the activity is sodium ion. Addition of sodium chloride to the water-insoluble fraction of Walker 256 tumor tissue and to the casein diet results in markedly increased water intake, food intake, and weight gain.

Coauthors of the paper in the *Journal of the NCI* are Jane N. Toal, Dr. Florence K. Millar, and Robin H. Brooks.

of medium containing only glucose, glutamine, and salts, the amount of virus formed per cell was strikingly reduced. In this situation there is rapid loss of amino acids from the cell pool; and the capacity of the cell to form virus was restored by the addition of a full complement of amino acids to the medium.

It is clear that optimal poliovirus synthesis by the HeLa cell requires the presence of free amino acids in the pool, and recent experiments with labeled amino acids and purified virus (Darnell and Levintow) have unequivocally shown that these amino acids are used in the synthesis of viral protein, rather than host protein.

Parainfluenza 3 Relationship to Human Virus Indicated

Parainfluenza 3, a virus closely related to a common human viral agent, has been isolated from cattle with the respiratory disease known as shipping fever, adding weight to the thesis that viruses may be an important cause of this infection.

From 1957 through 1959 in seven separate outbreaks of respiratory disease in calves and older cattle, thirteen isolations of this agent were made from nasal secretions and diseased lungs of the sick animals and from the nasal secretions of three apparently normal calves. The viruses were isolated on tissue culture of bovine embryonic kidney and were identified by the hemadsorption-inhibition technique. Although serological neutralization tests were done, hemagglutination-inhibition was found to be equally sensitive and was therefore used extensively throughout the studies.

Report Published

A report on this research appears in the current issue of the "American Journal of Hygiene." Co-authors are Drs. F. R. Abinanti and R. J. Heubner, Laboratory of Infectious Diseases, National Institute of Allergy and Infectious Diseases; Drs. R. J. Byrne, L. J. Polema, and F. R. Lucas, University of Maryland Department of Veterinary Science and the Maryland Livestock Sanitary Service at College Park; and Dr. R. L. Watson, Communicable Disease Center, Atlanta.

Prior to recovery of this virus from cattle, a closely related virus, which is apparently common in humans, was shown to be responsible for respiratory illnesses in infants and young children. In a study published last year, parainfluenza 3 virus was shown to have caused 50 percent more acute respiratory disease in hospitalized children than the virus of Asian influenza.

Useful as Models

The authors point out that the study of respiratory disease in cattle is of great importance not only to the livestock industry, which must cope with the economic aspects of animal disease and death due to such outbreaks as shipping fever, but to those interested in human viral disease.

The investigators believe that respiratory diseases in cattle can serve as useful models of respiratory disease in humans. Rates of infection and the influence of the immunological and physiological state on these rates may be studied, as may the relationship of clinical infection to clinically inapparent infection, seasonal prevalence of disease, and physical factors concerned with the spread of respiratory infections. With a bovine population it is also pos-



Artist's conception of a negative test: tissue culture to which red blood cells had been added where no virus was present; and of a positive test: tissue culture in which the virus was growing and hemadsorption takes place following the addition of red blood cells.

sible to do detailed studies on the use of vaccines, assessing their usefulness in the control of respiratory disease.

With regard to the isolation of virus from apparently normal calves, the investigators note that their current studies do not establish whether these animals became infected by exposure to cattle or to humans. Parainfluenza 3 spreads readily from person to person so that bovine or other animal sources are unnecessary to explain frequent human infections. However, the possibility that domestic animals may serve as reservoirs of common human viruses requires careful study.

Interest in the problem of respiratory disease of cattle is international. During their research, Dr. Abinanti and his co-workers in the Laboratory of Infectious Diseases have run serological tests of bovine sera not only from different parts of the United States but from Tahiti and Japan, and have demonstrated parainfluenza 3 antibody in these sera. In Sweden, investigators at the Swedish Institute of Veterinary Medicine have reported isolation of a virus identical with parainfluenza 3, which they believe might be the primary cause of so-called transport disease.

Antibiotics Tested For Oral Effects

One of the continuing research programs of the National Institute of Dental Research is concerned with the testing of antibiotics and other agents which may be used for the control of calculus formation, caries and other oral conditions.

Scientists at this Institute recently completed studies in which chloramphenicol and chlortetracycline, both broad spectrum antibiotics, were tested for their effect on the development of dental calculus and caries in rats. The drugs were added at a level of 0.0005 percent to one diet known to promote caries development and to another diet known to accelerate calculus deposition. Calculus severity ratings were then compared with control groups receiving the same diets without antibiotics.

The results indicated that neither antibiotic influenced calculus formation. Both, however, demonstrated significant caries reduction

in the test animals, with chlortetracycline showing the more marked effect.

These results complement earlier NIDR findings with germfree animals where it was demonstrated that calculus-like deposits may occur in the absence of oral bacteria while dental decay does not.

In the current study further significant findings were made when samples of the crude and ashed calculus deposits from the animals were analyzed and subjected to electron and x-ray diffraction. The mineral phase was identified as hydroxyapatite; thus the dental deposits in the rat may be considered analogous to oral calculus of humans.

Data from this cooperative study by Drs. R. J. Fitzgerald, H. V. Jordan, D. B. Scott and Mr. H. G. McCann, representing three Laboratories of NIDR, will provide research workers with a useful tool for the study of deposition and control of dental calculus under experimental conditions. This work will be published in the Archives of Oral Biology.

Addiction Incidence Related to Traits Of Personality

In a study of personality characteristics of 270 hospitalized narcotic addicts, investigators at National Institute of Mental Health's Addiction Research Center found significant evidence associating mental disturbance with the occurrence of drug addiction. Drs. Harris E. Hill, Charles A. Haertzen, and Robert Glaser found that personality characteristics of narcotic addicts are either associated with psychopathy or are predominantly psychopathic in nature, although they may include many of the classical psychoneurotic and psychotic features.

MMPI Provides Scores

The investigators administered the Minnesota Multiphasic Personality Inventory (MMPI), which provides scores on several aspects of personality related to mental disturbance and conduct disorder, to 270 male, former narcotic addicts during 1951-52 who were undergoing rehabilitative therapy at the Public Health Service Hospital at Lexington, Kentucky. They were tested approximately 4-8 weeks following admission and recovery from the illness which follows withdrawal of opiates. The patients were not deteriorated or overtly psychotic.

The present study compared the composite profiles produced by these addicts in (a) a "teenage" group, (b) a White group, and (c) a Negro group. Except for a small number of individuals it was found that all groups and subgroups of this study produced abnormal composite profiles and that one deviation they possessed in common was an abnormally high T-score on the psychopathic deviate scale.

Delinquency Relation Suggested

The present study was concerned with individuals after they had become addicted. However, various studies considered in conjunction suggest that the preaddiction personality does not change fundamentally following addiction. In addition, these MMPI profiles revealed no appreciable differences between the personality characteristics of adolescent addicts and those of adult addicts.

The results also show a strong similarity between adolescent addicts and non-addict delinquents, which reinforces the assumption that some common denominators in psychopathology may be importantly involved in the etiology of addiction and delinquency.

The study was reported in the *Journal of General Psychology*.

New Technique Speeds Nerve Impulses

A new technique that speeds nerve impulses by short-circuiting internal resistance has been devised by National Institute of Neurological Diseases and Blindness investigators.

The normal velocity of transmission of nerve impulses in the squid axon has been enormously increased through the use of low surface-resistance wires threaded along the interior of nerve fibers. By this technique, the nerve's longitudinal electrical resistance is short-circuited and conduction rates may become almost infinite over the short region occupied by the wire.

The technique also provides an example of an almost perfect "space clamp." An ideally space-clamped region is defined as one over which potential changes may occur, but where the potential is the same at every point at any instant.

The important new finding was reported by Dr. J. delCastillo, formerly of the NINDB Electroencephalography Branch, and Dr. J. W. Moore of the NINDB Laboratory of Biophysics, in the *Journal of Physiology*.

Expectations Confirmed

Previous experiments have shown that small changes in the speed of nerve impulse transmission are observed when the external longitudinal resistance is varied. However, much greater impulse transmission velocity was expected and found when the large internal resistance of the nerve was reduced by the insertion of a wire.

Giant motor-nerve fibers dissected from the squid were placed in a horizontal cell, and microelectrodes for measuring action potentials were inserted into the membrane. The transmission speed between these microelectrodes agreed with speeds reported by other studies.

However, when an axial platinum wire electrode was inserted, a marked increase in conduction velocity resulted. In some cases, the time difference between action potentials recorded by the two microelectrode tips was reduced from a thousandth of a second to a few millionths of a second.

As was expected, the increase in the conduction velocity was inversely related to the surface resistance of the electrodes, so that with wires of resistances as low as 20 ohm centimeters, the conduction velocity was 250 times greater than normal over short lengths (1.5 cm.) of axon.

The investigators also concluded that the space clamp achieved by using electrodes of this resistance approaches the ideal.

Studies Show Mechanism of MER-29 In Lowering of Blood Cholesterol

Because the body synthesizes large amounts of cholesterol, actually more than is provided by the diet, the possibility of lowering serum cholesterol levels by inhibiting the body's own production of cholesterol through drug treatment has attracted increasing attention over the past few years.

A number of pharmaceutical companies are conducting large-scale screening programs in a search for non-toxic inhibitors of cholesterol synthesis. One of the most promising compounds in this area, MER-29, was shown by investigators at the William S. Merrell Company (Thomas Blohm and Robert Mackenzie) to be effective in experimental animals, and preliminary studies in several clinics have shown it to be effective in man without any important toxic effects.

Reaction Pinpointed

Recent findings by investigators at National Heart Institute and National Institute of Arthritis and Metabolic Diseases have pin-pointed the reaction blocked by the drug. This appears to be the very last step in the complex pattern of reactions by which the cholesterol molecule is formed.

The NIH investigators observed that the sterol material in the livers of rats treated with MER-29 had properties that differed subtly, but definitely, from those of cholesterol, which constitutes the major sterol in normal livers. Careful fractionation procedures led to the isolation of large amounts of desmosterol, a compound resembling cholesterol in almost every detail of structure but lacking two hydrogen atoms at one point in the molecule.

The investigators injected radioactive acetate into animals treated with MER-29 and found that most

of the radioactivity accumulated in desmosterol rather than in cholesterol. Clinical studies showed that desmosterol accumulates in high concentrations in the serum of treated patients.

Conversion Blocked

Published in a 1960 issue of the *Journal of Research Communications*, these and other findings permit the conclusion that MER-29 exerts its effects on the cholesterol levels in man by blocking conversion of desmosterol to cholesterol. The findings also help to elucidate the process of normal cholesterol biosynthesis in man by providing factual evidence to support the assumption that desmosterol is a necessary intermediate in this process.

The biologic role of desmosterol warrants more thorough investigation, the investigators suggest. Information thus gained might be pertinent to the safe long-term use of drugs, such as MER-29, which may lead to the pile-up of compounds normally present in only very low concentrations.

Synthesis of MER-29 was announced by Frank Palopoli and his co-workers at the William S. Merrell Company in Cincinnati in 1958. Its effect in lowering serum cholesterol in rats was announced by Thomas Blohm and Robert Mackenzie of the same pharmaceutical concern in 1959. MER-29, also called "triparanol" was made available for clinical research by the William S. Merrell Company.

The NIH studies were conducted by Drs. Joel Avigan and Daniel Steinberg of the National Heart Institute and Mr. Malcolm J. Thompson and Dr. Erich Mosettig of the National Institute of Arthritis and Metabolic Diseases.

Gas Chromatography Detecting System Developed in NIH

For maximum usefulness as an analytical tool in the biologic sciences, the principle of gas chromatography as introduced from England has required the design and incorporation of more sensitive and versatile systems for detecting the constituents of complex samples once the chromatograph had separated them.

Investigators in the National Heart Institute Laboratory of Technical Development have attacked this problem on several fronts with notable success, designing and developing detecting systems which permit extension of gas chromatography to many new research areas.

Equipment Described

New detecting equipment utilizing variations or measured sound velocity was described by Frank W. Noble at the conference on Electrical Techniques in Medicine and Biology recently held in Philadelphia under sponsorship of the Institute of Radio Engineers, the Instrument Society of America, and the American Institute of Electrical Engineers.

The velocity of sound passing through a gas varies according to physical characteristics of the gas, such as its molecular weight, Mr. Noble pointed out. With the equipment described, voltage is applied to a sound transmitting crystal at one end of a tube containing the sample and recorded from a receiving crystal at the other end of the tube. Phase differences, induced by particular samples, between the two voltages are sufficiently definitive to imply analytical usefulness for the principle.

The actual value of the sound velocity principle as utilized in the equipment Mr. Noble described remains to be demonstrated in applied research.

Cancer Studies in Nuns, Married Women, Reveal Differences

Previous studies have suggested that women in religious orders have a higher risk of developing cancer of the breast and a lower risk for cancer of the uterine cervix than other women. Dr. Ruth S. Taylor, Benjamin E. Carroll, and J. William Lloyd, of the National Cancer Institute's Field Investigations and Demonstrations Branch, have now reported results of a study comparing mortality among three orders of Roman Catholic nuns with that of a group of women in the general population of similar age and background, with particular reference to cancer.

The study was designed to detect any differences that might be

attributed to the single as contrasted to the married state, and to obtain definitive information concerning total cancer and some of the major causes of death other than cancer.

The findings of the present study with respect to breast cancer are in general agreement with those of previous studies, all of which indicate that single women have a lower risk of mortality from breast cancer early in life, then increasingly higher rates, with a lifetime rate that is much higher than that of married women.

The results also confirmed a mortality risk for cancer of the uterus that is much higher among married than among single women.

The evidence indicates that the difference is due to a deficiency in the rate of cancer of the uterine cervix among single women.

The Sisters showed lower total cancer mortality than did the controls between the ages of 20 and 59, higher rates above that age, and total experience about the same. They showed a much higher mortality rate from tuberculosis than did the controls, the highest risk occurring between the ages of 20 and 29. In mortality from cardiovascular-renal disease, the Sisters had more favorable experience than did the controls, particularly after age 50.

These results were summarized in a recent issue of *Cancer*.

Radiation Belt Expert To Speak at Luncheon

Dr. James A. Van Allen, discoverer of the radiation belts in space that now bear his name, will be the luncheon speaker at the Fifth Annual Engineers, Scientists and Architects Day program, to be held at the Presidential Arms Hotel in Washington, February 25. Dr. Van Allen will speak on "The Radiation Environment of the Earth."

The five-hour program will begin at 9:30 a.m. with an open discussion among four leaders in the fields of science, engineering, and architecture.

Tickets, which include the luncheon, are \$3.00, and may be obtained by calling J. C. Kinsey at Vitro Laboratories, Silver Spring, WH. 2-7200, Ext. 371-2.

Research Grants Makes Two Appointments

Two new appointments were recently announced in DRG.

Steve Remias has been appointed Chief, Statistical Processing Section, Statistics and Analysis Branch, DRG. He joined DRG on February 1.

Mr. Remias transferred from the Office of the Surgeon General of the Air Force, where he was Deputy Chief of the Biometrics Division. Prior to that assignment he was a Public Health analyst with the Bureau of Medical Services, PHS.

Dr. Joseph V. Michalski will join DRG March 1 as Assistant Chief for the Biological Sciences Research Group, Research Grants Review Branch. He will be Project Review Officer and Coordinator for the eight study sections in the group.

Dr. Michalski is presently a Public Health Research Program analyst for the Extramural Programs Branch of NIAID. Before coming to NIH in 1958 he served for two years as Chief of the Medical Museum Laboratory, Armed Forces Institute of Pathology.

Dr. Curreri Appointed To Cancer Council

Dr. Anthony R. Curreri, Professor of Surgery at the University of Wisconsin Medical School and Director of the University's Cancer Research Hospital, has been appointed a member of the National Advisory Cancer Council.

Dr. Curreri's term of office, which began on January 1, 1960, will extend to September 30, 1962.

This appointment fills the vacancy created by the resignation of Dr. Charles A. Evans, Professor of Microbiology, University of Washington School of Medicine, Seattle.

RESEARCH CONDUCTED IN VIETNAM



Dr. Albert L. Russell, NIDR epidemiologist, conducts a dental examination under the curious eye of a South Vietnam soldier in a mountain village near Dalat. Dr. Russell, Chief of the Epidemiology and Biometry Branch, and Dr. Ernest C. Leatherwood, also of NIDR, recently returned from two months in Vietnam where they served as members of a special survey team sponsored by the Interdepartmental Committee on Nutrition for National Defense. They examined approximately 3,700 Vietnamese to record the status of oral disease in that country. Data collected on the incidence and severity of dental caries and periodontal disease in Vietnam will appear in an ICNND report late in 1960, and will complement similar epidemiological data collected during surveys in India, Alaska, Ethiopia, Peru, and Ecuador.

Local AFGE Members Attend Banquet

Twelve members of NIH Lodge 1690, American Federation of Government Employees, attended the Annual Civil Service Anniversary banquet January 16, in the main ballroom of the Willard Hotel. The banquet is sponsored each year by the AFGE.

Barbara Bates Gunderson, Civil Service Commissioner, acted as master of ceremonies. Speakers included Senate Majority Leader Lyndon Johnson and Veterans Administrator Sumner Whittier, a member of the AFGE.

Officers of Lodge 1690, recently elected to serve during the present year, are: Hazel Gump, NCI, President; George LeCompte, DRS, 1st Vice President; William F. M. Campbell, CC, 2nd Vice President; Thomas Schrader, Jr., DRS, Treasurer; Martha B. Smith, DRS, Secretary; and William E. Olson, DRS, Sergeant-at-Arms.

Archie Thompson Retires

Archie R. Thompson, a laboratory animal caretaker in the Laboratory of Biology, NCI, retired at the end of December. He came to NIH in 1947, and twice during his Government career received an Outstanding efficiency rating. Mr. Thompson is a native and resident of Gaithersburg, Md.

Bank Hours Extended

The NIH Branch of the Bank of Bethesda, in the CC, will extend its banking hours on Civil Service paydays, starting February 16.

Payday hours will be 9 a.m. to 4 p.m.

Banking hours on Wednesday following each payday will be 11 a.m. to 2 p.m. Otherwise, the bank is open from 9 a.m. to 2 p.m., Monday through Friday.

Training Committee For Microbiology Established Here

A Microbiology Training Committee has been established in DGMS following approval by Surgeon General Leroy E. Burney. The committee, composed of experts representing the different specialties of microbiology, held its first meeting at NIH on January 11.

Under the chairmanship of Dr. Morris F. Shaffer, Chairman, Department of Microbiology, Tulane University School of Medicine, the committee will serve to review training grant applications in microbiology and related fields. It will function under Dr. G. Halsey Hunt, Chief of DGMS, and Dr. Frederick L. Stone, Assistant Division Chief and Chief of the Research Training Branch. Dr. Margaret Carlson will be Executive Secretary.

The microbiology program is designed to support training at predoctoral and postdoctoral levels in medical schools, schools of public health, veterinary schools, other recognized graduate schools, research institutions, and hospitals, in the basic aspects of microbiology, bacteriology and virology. Included will be such areas as microbial genetics, cellular physiology, and cellular metabolism.

The program seeks to provide a basis for the development of senior members of departments in various fields of academic medicine who will teach or carry out research work in health-oriented fields.

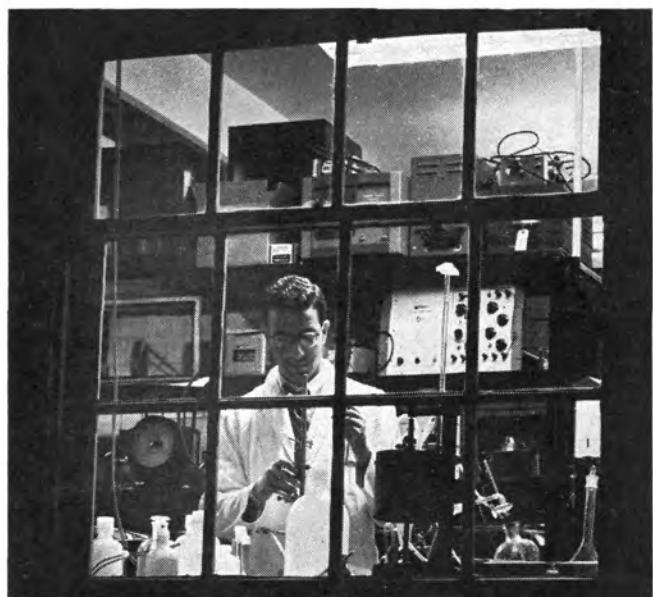
Members of the Committee include: Dr. George W. Kidder, Amherst College; Dr. Charles L. Wiseman, Jr., University of Maryland; Dr. Orville Wyss, University of Texas; Dr. Alan W. Bernheimer, New York University College of Medicine; Dr. S. Edward Sulkin, Southwestern Medical School, University of Texas; Dr. Ralph Emerson, University of California; Dr. A. F. Rasmussen, Jr., University of California Medical Center; and Dr. P. W. Wilson, College of Agriculture, University of Wisconsin.

Following its review of training applications, the Committee will make appropriate recommendations to the National Advisory Health Council.

Miss Pilgren Dies

Elizabeth Pilgren, research technician with the Laboratory of Bacterial Diseases, NIAID, died on January 22 following surgery.

Miss Pilgren came to NIH in 1943 and had worked in infectious diseases research from that time until her death. She was a native of Washington, D. C., and lived in Bethesda.



Though the office lights go out at 5 p.m. and most of the staff leaves the reservation, NIH is active throughout the night. From left to right, starting at the top: Cars bring visitors to CC patients, and window lights mean cleaners are busy, while in one of the laboratory buildings a scientist con-

tinues an experiment. A nurse on night duty brings medication to patients on her ward, and in the CC gymnasium a group of employees learns how to stay slim. The housecleaning crew cleans the floors at night, and the guards patrol the grounds at hourly intervals until morning.

All photos, except that of the nurse, by Jerry Hecht, NIH.