

# the NIH Record

FILE COPY

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

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NATIONAL INSTITUTES OF HEALTH

## Agency Status, Quality of Research and Programs Mark Growth Under Shannon

Establishment of several new organizational components, elevation of the National Institutes of Health from bureau to agency status, and growth of the budget to above the billion-dollar level—these are some indicators of NIH expansion during 13 years of direction by Dr. James A. Shannon.

The NIH of August 1968 differs greatly in size, status and scope from the NIH of August 1, 1955, when Dr. Shannon was appointed Director.

Even before he became Director, Dr. Shannon had recognized the need for a scientific base on which to establish adequate tests and standards for new biologics.

It was this recognition that led to creation of the Division of Biologics Standards with both regulatory and research functions. This might be considered to have heralded the Shannon era of growth and development.

In 1955, NIH consisted of seven Institutes (Cancer, Mental Health, Heart, Dental Research, Arthritis and Metabolic Diseases, Neurological Diseases and Blindness, and Allergy and Infectious Diseases); the Clinical Center; and the following Divisions in addition to Biologics Standards: Research Grants; Research Services; and Business Operations.

Today, the NIH consists of eight

## Congress Passes Bill For Eye Institute

A bill establishing a National Eye Institute in the National Institutes of Health is awaiting Presidential signature as the *NIH Record* goes to press.

The bill (H.R. 12843), which was passed by the House by voice vote on Aug. 1, 1968, was adopted by the Senate a day later.

The new Institute will be responsible for the conduct and support of research for new treatment, cures, and training relating to blinding eye diseases and visual disorders.

The functions which the National Institute of Neurological Diseases and Blindness and other institutes now exercise with regard to blinding eye diseases and visual disorders will be transferred to the new Institute under the bill.

Institutes (Cancer, Heart, Dental Research, Arthritis and Metabolic Diseases, Neurological Diseases and Blindness, Allergy and Infectious Diseases, General Medical Sciences, and Child Health and Human Development); the Clinical Center; the Divisions of Biologics Standards, Research Grants, Research Services, Research Facilities and Resources, Computer Research and Technology, and Environmental Health Sciences; and, since April 1, 1968, the Bureau of Health Manpower, and the National Library of Medicine.

These organizational changes and the growth of NIH appropriations merely hint at the vastly more im-

(See *STATUS*, Page 8)

## Dr. Shannon Honored at State Dept. Reception

Dr. James A. Shannon was honored at a farewell reception in the John Quincy Adams Room at the State Department Building last Thursday evening, attended by Congressional and Executive Branch leaders, scientists and colleagues.

Dr. Robert Q. Marston, who will succeed Dr. Shannon, introduced DHEW Secretary Wilbur J. Cohen, who spoke briefly during a presentation ceremony.

Dr. Jack Masur, Director of the Clinical Center, presented Dr. Shannon with a Steuben crystal owl, the gift of members of the Director's staff, and an album of photographs depicting important events during his years as Director.

"We respect you because as a di-

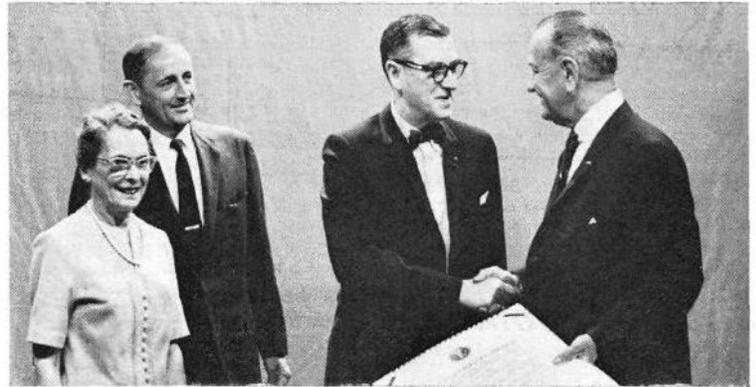
(See *RECEPTION*, Page 8)

## Cohen Will Administer Oath To Marston on August 29

DHEW Secretary Wilbur J. Cohen will officiate at 11:30 a.m., Aug. 29 at a swearing-in ceremony for Dr. Robert Q. Marston as NIH Director in the Clinical Center auditorium.

All employees are invited to attend the event.

## Shannon Recalls Years as NIH Director; Cites 'Greatest Personal Satisfaction'



**PRESIDENTIAL HONOR.** Mrs. Shannon and DHEW Secretary John W. Gardner beam proudly as President Johnson presents the Distinguished Federal Civilian Service Award to Dr. Shannon in 1966.

The growth, the achievements and the prestige of the National Institutes of Health were being cited this week as monuments to the wisdom, sensitivity, skill and toughness of Dr. James A. Shannon, NIH Director for the past 13 years, who will retire Aug. 31.

Dr. Shannon will join the staff of the National Academy of Sciences Sept. 1, in what he calls a "non-operational position."

In revealing his plans, Dr. Shannon said "Beyond that (Academy position) I have neither definitive plans nor prejudices except to exclude from consideration a number of positions I do not consider suitable for one at age 64. I doubt that I will ever be a Dean or a Vice President for this or that."

Recalling his years as Director, Dr. Shannon observed that his greatest personal satisfactions have come in four areas. He said these were:

"First, the development and continued general excellence of the direct operation at Bethesda and its associated field stations;

"Second, an intimate association with intellectual excellence, made possible by direct contact with a substantial number of the scientific leaders of the Nation;

"Third, the development of a broad science base for the Nation in the biomedical field *per se*, and development of highly relevant areas in the physical sciences and engineering—the latter, unfortunately, having been unduly restrained by lack of funds during the past three years; and

"Fourth, the concrete and substantive accomplishments of the NIH program."

Dr. Shannon said he believes the greatest single accomplishment at NIH during the past 13 years has been "the establishment of general excellence of the NIH operation, and importantly, the acceptance by the scientific community that such

## 'Jim' Shannon NIH Farewell Scheduled for Next Tuesday

All employees of NIH are invited to greet Dr. James A. Shannon, retiring Director, at 4 p.m., Aug. 27 in front of the Building 1 steps.

In event of rain the assembly will be at 4 p.m. Aug. 28.

Dr. Shannon will speak to the assembly briefly. The occasion is expected to be one of Dr. Shannon's last official acts before turning over direction to Dr. Robert Q. Marston.

excellence is indeed characteristic of it."

Elsewhere in this issue, the *Record* prints summaries of the program changes, the growth in budget and physical plant, and important results of scientific re-

(See *DR. SHANNON*, Page 8)

# the NIH Record

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## NEWS from PERSONNEL

### RIOTS AND CIVIL DISORDERS

On June 19, 1968, President Johnson signed into law the "Omnibus Crime Control and Safe Streets Act of 1968."

One section deals with factors that disqualify individuals for Federal service if they are convicted of a felony committed in a riot or civil disorder after the effective date of the law.

Here, "felony" is defined as any offense for which imprisonment is authorized for a period exceeding one year.

### Offenses Listed

Further, the law states that a person convicted of certain offenses by a Federal, State, or local court, is ineligible for a position in Federal or D.C. government for 5 years following the date upon which his conviction becomes final. The offenses are:

- Inciting a riot, or civil disorder;
- Organizing, promoting, encouraging, or participating in a riot or civil disorder;
- Aiding or abetting a person in committing the above offenses, and
- An offense determined by the head of the agency employing the individual to have been committed in the furthering of, or participating in, a riot or civil disorder.

Any individual holding a Federal or D.C. government position on the date of his final conviction will be removed from his post.

### OUTSIDE ACADEMIC ACTIVITIES

Staff members who wish to teach, lecture, or engage in other types of professional activity outside of regular working hours must obtain prior approval.

NIH encourages its professional staff to teach and lecture, and participate in seminars and panel discussions when such activities do not interfere with official duties. However, conducting full semester daytime classes is not authorized.

Teaching evening, weekend, or summer classes may be approved if schedule adjustments are arranged.

Staff members who had outside work approved during Sept. 1, 1967 through Aug. 31, 1968, will be required to submit a full report. Instructions and report forms will be issued by Bureau of Health Manpower, National Library of Medicine, and institutes and divisions.

HEW has published regulations on Standards of Conduct, in the Federal Register, Apr. 17. Reprints were distributed to employees in May.

Extra copies may be obtained from BHM, NLM, and I/D Personnel Offices.

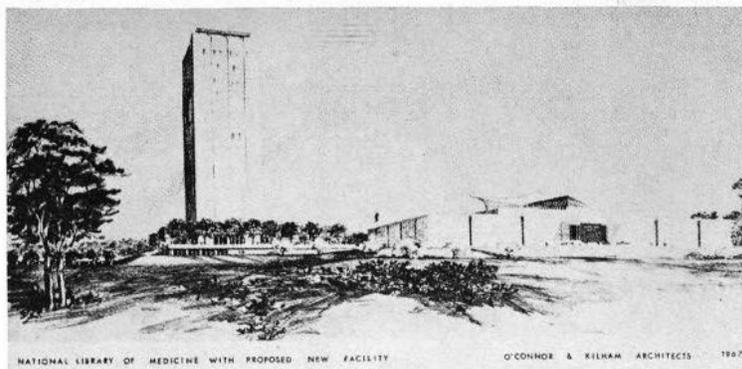
### U.S. Marine Band Concert At CC Thursday, Aug. 22

A concert for Clinical Center patients will be presented Thursday, Aug. 22, at 7:30 p.m. by the U.S. Marine Band in the Clinical Center auditorium.

NIH employees, their families and friends, are invited to attend, but patients will have priority in seating.

Arrangements for this concert were made by the CC Patient Activities Section.

## NLM Biomedical Communications Center Named for Lister Hill, Alabama Senator



Architect's sketch shows the proposed new NLM facility.

President Johnson recently signed into law the legislation designating the planned National Center for Biomedical Communications, as the Lister Hill National Center for Biomedical Communications.

The Center was named for the Senator from Alabama "to perpetuate the name of the man who has done so much for the health of the nation, according to Senate Joint Resolution 193, introduced by another Alabama Senator, John Sparkman. It will be a part of the National Library of Medicine which Senator Hill and the late President Kennedy helped to create.

A Biomedical Communications Network with electronic equipment and the most up-to-date technology will be a focal point of the Center.

The system will more quickly transmit new information to doctors, scientists and educators in all of the health professions.

Staff planners at the NLM have been studying how the Center might apply television, satellite communications, films, lasers, and

computers for resolution of those problems of health dependent upon communications.

Dr. Martin M. Cummings, Director of the NLM, on learning of the President's action, stated, "People who are interested in the improvement of medical communications are delighted that the Center will serve as a monument to the far-reaching vision of Senator Hill who in his legislative career has provided so many new and important horizons for American medicine, for research, education and for libraries."

Current planning by NLM for the design of the Center calls for a tower-type annex, to be erected a few yards southwest of the library.

### Dr. Gordon Appointed NCI Program Director

Dr. Mordecai H. Gordon has been appointed program director for Epidemiology in the Awards, Review and Technical Administration Branch. He was formerly assistant director, Review and Referral Staff, Office of Extramural Programs in the Office of the Surgeon General.

Dr. Gordon will develop NCI's program of extramural grants in support of projects in cancer epidemiology. His appointment was announced by Dr. J. Palmer Saunders, associate director for Extramural Activities, NCI.

Dr. Gordon received his B.S. in English from New York University, an M.A. in Education of the Mentally Handicapped from Columbia University, and his Ph.D. in Clinical Psychology from the University of Tennessee.

Before joining NIH in 1959, Dr. Gordon held several positions in clinical psychology, including chief of the Clinical Psychology Service at the V.A. Psychiatric Hospital in Knoxville, Iowa.



Four outstanding Montana high school science students received Fellowships for biomedical research, given by the Montana Division of the American Cancer Society. They spent the 8 weeks at NIAID's Rocky Mountain Laboratory. (L to r): Mrs. Rudolph Gerer, chairman of the local chapter; Allen Taylor; Deborah Clarke; Michael Strain; Arlene Todd, and Rocky Mountain Laboratory's Director, Dr. Herbert G. Stoenner.



**BETHESDA LEADERSHIP.** This pose of Dr. Shannon with Institute Directors, senior members of his own staff, and others, in the mid-60's manages to make everyone seem formal yet relaxed, dignified but pleased with future prospects.

## DR. SHANNON

(Continued from Page 1)

search that have occurred during Dr. Shannon's tenure.

Appraisals of significant elements of the "Shannon Era" from his key past and present associates in government and the academic world, included tributes to Dr. Shannon's leadership, his "exquisite sensitivity to the attitudes of others," his devotion of time and energy so that "almost everything that happened bears his imprint."

Dr. Shannon's retirement from NIH and his association with the National Academy of Sciences will open a new chapter in his 37-year career as a medical researcher, teacher and administrator.

Holding both M.D. and Ph.D. degrees, he achieved early recognition as a teacher of physiology and research director, and for original research in kidney function, chemotherapy and malaria control.

For services as consultant on tropical diseases on the staff of the Secretary of War during World War II, Dr. Shannon received the Presidential Medal of Merit, highest award at that time for civilian service in government.

Later he was director of the Squibb Institute for Medical Research, and a special consultant to the PHS Surgeon General.

He joined the PHS Commissioned Corps in 1949, and served first as Associate Director in charge of research in the National Heart Institute. He became Associate Director of NIH in 1952 and Director in 1955, succeeding Dr. William H. Sebrell, Jr.

His career has been marked by 17 important honors, awards and lectureships and election to 13 national scientific societies.

He received the Public Welfare Medal, most distinguished award of the National Academy of Sciences, in 1962, for "eminence in the application of science to the public welfare." In 1964 he received the Rockefeller Public Service Award for Science, Technology, or Engineering.

### Won Many Honors

In 1965 Dr. Shannon was elected to membership in the National Academy of Sciences. In 1966 he received the PHS Distinguished Service Medal, *Modern Medicine's* Award for Distinguished Service in Medicine, the Presidential Distinguished Federal Civilian Service Award and the Abraham Flexner Award of the Association of American Medical Colleges. He was awarded 18 honorary degrees by universities in this country and Europe.

As NIH "boss," Dr. Shannon has supervised its growth from bureau to agency status, and has seen the addition of three new institutes, four Divisions, the National Library of Medicine and the Bureau of Health Manpower.

During the years he has been testifying as chief officer of NIH, Congress has increased total appropriations from \$81.3 million to \$1.2 billion.

Changes will continue to be great in the next 10 years, Dr. Shannon believes, particularly in the area of organized research.

Dr. Shannon told the *Record* he believes changes should not be made "at the expense of on-going activities unless the latter warrant

## Former Medical Writer Assesses Impact Of Shannon Era on Biomedical Research

By "Mike" O'Neill, Managing Editor, N. Y. Daily News  
(Former Washington Bureau Chief, Medical World News)

In reviewing the revolutionary sweep of science since World War II, it is customary to ignore administrators. They are the anti-heroes, often abused, seldom honored, and eventually forgotten.

This is a miscarriage of history. For if a great scientist is a rare phenomenon, then a great administrator of science is rarer still. In many ways he must have an even deeper understanding of the complex currents of modern research and a surer vision of future needs and trends.

If anyone proves the point he is NIH's retiring Director, Dr. James A. Shannon. As much as any other single man, possibly more, he has set the tone for an unprecedented expansion of the Nation's medical research effort. Certainly he has profoundly influenced its content and direction.

Along with Marion Folsom, Lister Hill, John Fogarty, Mary Lasker, and others, Dr. Shannon championed a rapid build-up in Federal research support, usually working against the grain of administration policy and skillfully by-passing roadblocks thrown up by less perceptive bureaucratic superiors.

His role was critical in the annual drive for ever-increasing NIH appropriations. He not only commanded the respect—and usually the backing—of the scientific community; he also developed direct links to powerful Government policy makers like former presidential science advisor Jerome B. Weisner.

Even more importantly, the quiet but tough minded NIH Director had the confidence of Hill and Fogarty. Although they often chafed at his stubbornness and sometimes overrode his advice, they valued his judgment and integrity.

In the whirl of conflicting pressures—from voluntary agencies and influential health spokesmen, from termination because of internal scientific considerations.

"As the science base has broadened," Dr. Shannon observed, "many opportunities for organized research are developing. These are the areas in both the fundamental, applied and developmental aspects of science which, being beyond the capacity of individual scientists to undertake, are important and will benefit by formal organizational arrangements.

"Such 'organized research' is not to be equated with targeted activities," he commented, "although such opportunities are becoming increasingly available. However neat and tidy such organized activities appear and however promising a

(See DR. SHANNON, Page 9)



Mr. O'Neill

research leaders and medical institutions—Dr. Shannon never yielded any of his celebrated personal and professional independence. Hill and Fogarty came to rely on him to protect the soundness of programs in which they and the Nation had a large stake.

All of this gave Dr. Shannon great power in a city where power is the name of the game. And he used it freely, often with considerable private relish, to drive through programs which he considered essential to the expanding research effort and to frustrate or modify ideas which he regarded as premature or ill-founded.

Almost single handedly, for example, he sold Congress on a whole series of devices, from training grants to research career awards



**MUSIC APPRECIATION.** A known HiFi addict, Dr. Shannon has an extensive electronics setup at home which he enjoys at every opportunity.

and institutional grants to provide indirect aid to the medical schools, at a time when their own leaders were still resisting the direct assistance they needed to meet soaring research and educational responsibilities.

On the other hand, he recently cooled down a high-pressure effort to get the Government to finance a large scale artificial heart development program. He simply argued, as he had once argued vainly against the original scattergun cancer chemotherapy program, that there still was not enough basic knowledge to justify a costly developmental effort.

This "facility in the art of the possible," as Dr. Philip H. Abelson once remarked in *Science*, has been a key factor in Dr. Shannon's effectiveness, for it is the vital bridge

(See IMPACT, Page 5)



**PEDAGOGICAL POSE.** Dr. Shannon in a pose typical of his appearances at hearings and conferences, about 1963.

## Medical-Health Advances in Shannon Era Bear Imprint of NIH Research, Support

Research accomplishments in the medical and health field since 1955 have been truly impressive in terms both of saving of lives and improvement of health and of increases in fundamental knowledge.

During these 13 years, the National Institutes of Health has touched in some way almost every one of these advances through the multiple sources of support it has been able to provide, thanks to the farseeing leadership given by both the Executive Branch and the Congress.

### Intramural Accomplishments

At Bethesda alone, the accomplishments of NIH's own scientists have been too many to enumerate here. They range from development of the first successful chemical treatment of a solid cancer to so-called cracking of the genetic code.

While each scientist in the laboratories and clinics, perhaps, each reader of the *Record*, will have his own list of important discoveries made at NIH, the following are significant in themselves and in their potential for leading the way to further progress in health improvement.

The cancer that can be success-

fully treated—in fact, cured—by a chemical, methotrexate, is choriocarcinoma, a cancer which attacks the uterus during pregnancy, and if untreated spreads rapidly to other organs and is always fatal.

This cancer is comparatively rare in the United States but much commoner in other parts of the world. The success achieved in treating it, some of the young mothers not only being saved to care for their offspring but enabled to bear other children, points to potential future developments in chemotherapy of cancer.

Methotrexate (amethopterin) is one of the elements in the new and highly successful VAMP treatment of childhood leukemia. The word VAMP is made from the initial letters of four chemicals, vincristine, amethopterin, 6-mercaptopurine, and prednisone.

Giving these four in suitable combination (rather than separately or in sequence) with antibiotics

and blood element replacements is bringing such swift and long-lasting remissions that five-year cures are being achieved in a growing number of cases of this tragic malignant disease which as recently as the late 1950s was uniformly fatal in a few months.

Discovery of the polyoma virus which can produce many different kinds of cancers and can cross species lines, producing tumors in more than one species of animal, opened up the field of cancer virology and has led to hope that at least some forms of cancer can be controlled through either immunologic or chemotherapeutic means.

Some of the latest accomplishments in the field of virology relate not to cancer but to neurologic disorders, specifically to kuru, a mysterious and fatal disease of primitive cannibalistic tribes in New Guinea and Guam, and Creutzfeldt-Jakob disease, also known as subacute spongiform encephalopathy.

### Brain Substance Noted

In each condition, material from brains of human victims of the diseases has caused symptoms much like those of the human diseases when injected into chimpanzees.

The findings are considered strong evidence that the causes of



**MAN AT WORK.** Dr. Shannon, holding a staff paper in one hand, gesturing with the other, in a characteristic pose in his office, early in 1968.

the two diseases are viruses which have been transmitted from man to chimpanzee. They add support to the theory that a number of human neurologic diseases, from kuru to multiple sclerosis, may be caused by slow-growing viruses.

In the area of more familiar virus diseases, a major accomplishment has been the development of a vaccine against rubella, or German measles, the seemingly unimportant childhood disease which causes such dire consequences to unborn babies when it strikes a pregnant woman.

Besides the protective vaccine, now showing great promise in extensive trials in this country and abroad, a rapid test for immunity to rubella infection was developed.

A successful vaccine against adeno-4 virus, cause of so-called recruit fever, and discovery that the Eaton agent, cause of one kind of pneumonia, is not a virus but a mycoplasma are other accomplishments in this field.

### Caries Factor Found

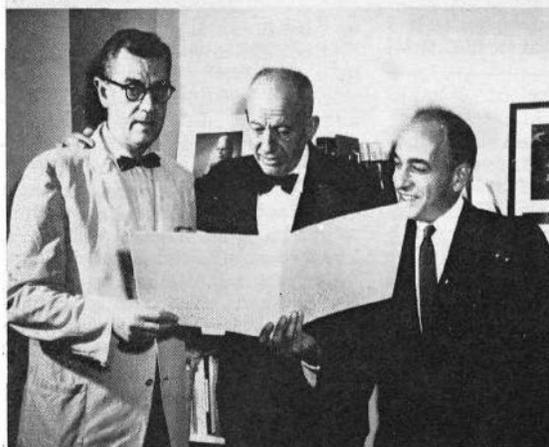
One of the most significant accomplishments of the past 13 years was the discovery that a specific strain of streptococci isolated from human mouths can cause rampant caries in laboratory animals.

Together with the subsequent discoveries of the plaque mechanism by which the microorganism adheres to teeth and of an enzyme which prevents formation of the plaque, this is believed to make possible complete prevention of caries, or tooth decay, within the next 10 years.

The nearly 50 percent decline in mortality from hypertension achieved during the past decade resulted primarily from knowledge of enzyme inhibition on which was based the success of the newer drugs developed by the pharmaceutical industry.

The first chemical definition of the molecular structure of a new thyroid hormone, thyrocalcitonin, has recently been accomplished, leading to synthesis of the hormone which affects blood calcium levels and may have wide usefulness in

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In addition to being a world famous research complex the NIH also is noted for its series of lectureships presented by distinguished and internationally renowned scientists from the United States and abroad, some of whom are pictured here with Dr. Shannon. These include the NIH Lecture Series, the R. E. Dyer Lecture Series, the Jules Freund Lecture Series, and the NIH International Lecture Series.

## IMPACT

(Continued from Page 3)

between vision and achievement in Washington.

In the long run, however, it is the achievement itself which counts. And it is this more than anything else that distinguishes Dr. Shannon's 13 years at NIH's helm.

From the beginning, Dr. Shannon saw the Nation's medical research need not in traditional terms but as part of a whole continuum of complicated interacting forces set in motion by a vast postwar technological revolution.

He recognized the need for a quantum increase in Federal support for the biological sciences to help bring them into balance with the physical sciences which had been racing ahead, partly under the stimulus of huge defense programs.

### Saw Converging Disciplines

And not incidentally he was one of the first to anticipate and promote the converging lines of inquiry that have resulted in such new disciplines as biophysics and bioengineering.

In expanding the Nation's medical research investment, Dr. Shannon relentlessly resisted the lures of short-term goals even when it meant opposing influential health leaders or Congressmen.

He insisted that the emphasis should be on fundamental research and tooling up for the future—building the basic foundations, the institutions, the manpower and the facilities for a greatly enlarged and more efficient scientific effort in the 1960s and 1970s.

Thus Dr. Shannon not only supported rapid increases in NIH research grants, primarily for basic investigators, but developed large-scale training grants and research facilities programs to expand the total research base.

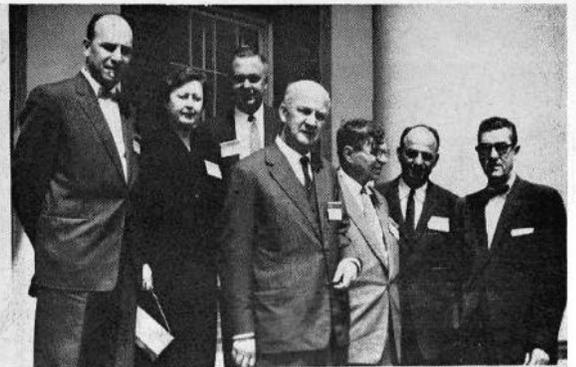
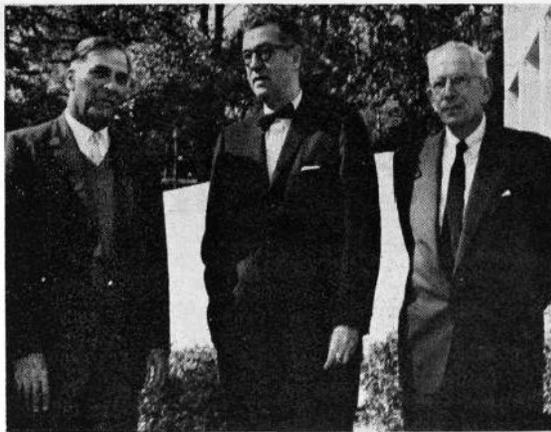
In fact, he skillfully shifted the emphasis in these programs to plug key research gaps or to exploit promising new opportunities indicated by emerging new research patterns.

### Massive Biological Support

Many of the current exciting developments in virology, especially in cancer, can be traced to a massive effort set in motion and largely sponsored by NIH which led to the present vigor of molecular biology and genetics.

The growth of biophysics, the prospective strengthening of pharmacology and a dozen other major advances along the medical research front also owe much to the perceptive decisions made by NIH and its Director.

In the long view of history, however, Dr. Shannon's greatest contribution may well be the degree to which he maintained the stability, the quality, and the essential free-



During the Shannon Era, NIH became a virtual mecca for scientists the world over. Reflecting this international flavor are these photos of Dr. Shannon with scientists from Russia, the Philippines, and Pakistan.



dom of the medical research system during a period of extraordinary growth and change.

The swift, many-fold increase in Federal support had a jarring, if not shattering, impact on the basic nature of the research effort and on institutions which had been supporting it.

Research, once a relatively peripheral adjunct of teaching, quickly became a major—and in some cases a dominant function of medical schools. Teachers who had only been engaged in research part-time began making it a career.

Heavy research grant loads threw operating budgets and academic goals out of adjustment. And there were the ever-present fears of Government interference in scientific and educational freedom.

Dr. Shannon vigorously allayed these fears by insisting on almost total freedom for individual investigators and institutions, demanding only high quality work.

He even made an effort to transfer some grant decision-making to

local institutions in an attempt to strengthen their role in the process and to make research a full member of the total academic team.

The NIH Director always felt that research, and the correlative production of medical scientists as well as practitioners, should be a central function of the medical schools. And he launched a whole series of programs, from research career awards to special training grants, to help bring this about.

But he was almost even more concerned about the total needs of medical education and, as we have already noticed, tried to meet at least some of these indirectly, during the years when the opposition of the medical and educational communities blocked action on large-scale, direct Government assistance. This in itself was a crucial stabilizing force.

"I don't know any other man who could have done a better job than Shannon in keeping this medical

research machine from flying apart," one top scientist remarked a few years ago.

"Despite the great centrifugal forces generated by expanding Federal support, he has somehow maintained control and perspective without disrupting the basic patterns of scientific integrity and independence."

He will be a tough act to follow.

## ADVANCES

(Continued from Page 4)

treatment of a variety of diseases.

A chemical accomplishment at the most fundamental level came from the series of observations on protein synthesis in cell-free systems which led to the first "cracking of the genetic code," showing how definite and precise instructions to cell structures for the creation of new cell material are passed from the original genetic material, DNA, via RNA to the next generation.

# The Shannon Era—Leadership

## An Appraisal by Colleagues



**SERVICE RECOGNIZED.** DHEW Secretary John W. Gardner presents Dr. Shannon with the Distinguished Service Medal in 1966.

Great intellectual enterprises have not generally flourished in the dry air of the Federal bureaucracy. When they do, we may be sure that someone has worked hard to create the appropriate conditions. To do so requires a special wisdom, toughness and skill, and James Shannon has those qualities.

He understands the complexities of Congressional functioning. He understands administrative channels—when to use them and when to circumvent them. But most of all he understands research and those who conduct research. He is a great American.

*John W. Gardner, former Secretary of Department of Health, Education, and Welfare*

The most significant element of the Shannon Era has been the emphasis upon quality as the *sine qua non* of the NIH operation. While no one would claim that either he or the operation did not make mistakes, that consideration was paramount, whether it involved the recruitment and retention of staff or the nature of our programs and their implementation.

*Dr. John F. Sherman, Associate Director for Extramural Programs, NIH*

Shannon has been able to bring about an exponential expansion in the total budget of NIH, from \$82 million in 1955 to \$1.2 billion in 1966. A key factor in achieving this has been his facility in the art of the possible.

Shannon has done more than increase quantity. He has built quality. . . . Shannon has been able to build good research teams and programs because he understands research, has judgment as to what is significant, and can quickly perceive where new opportunities lie. He has these abilities because early in his career he devoted nearly two decades to distinguished personal research activities.

*Dr. Philip H. Abelson, Editor, Science Magazine, 28 April 1967*



**OFFICIAL APPROVAL.** DHEW Secretary Anthony J. Celebrezze grasps Dr. Shannon's hand in warm greeting during one of his NIH visits.

The most significant element of the Shannon Era has been the mutuality of interest and respect that permeates the entire fabric of the NIH. A permissive rather than authoritarian environment is conducive to the creative ferment of scientific inquiry, but permission is not license.

The effectiveness of a leader under such circumstances is largely determined by his ability to make decisions acceptable to those most affected through thorough knowledge of the pertinent facts, exquisite sensitivity to the attitudes of others, and awareness of the consequences within and beyond his own community. Dr. Shannon is a master of that art.

*Dr. G. Burroughs Milder, former Director of Laboratories and Clinics, NIH*



**THE BEGINNING.** Secretary Oveta C. Folson (left) and Dr. Shannon (right) look on. Mrs. Hobby also was present as Secretary the same day Dr. Shannon was named Director.

Few informed observers would dispute the significance of the change in the medical educational system and the growing dependence of our society upon program support. . . . And now we find ourselves dependent for the support and, indeed, are now dependent upon survival. . . .

As we look to the future we must recognize the sensitive leadership which Jim Shannon brought to the NIH.

*Dr. G. Burroughs Milder, N. Y. Times, upon Shannon's death, Flexner*

I had many occasions to watch Dr. Shannon in action and to appreciate that he played many parts: the planner, the organizer, the educator, sometimes in turn, sometimes all at once, and sometimes them all.

His enthusiasm for biomedical research and his insight into the edge of its potential. More than most, he understood the intimate relationship between the laboratory and the public. He has striven to bring the two together, to create a broad public and to meet the goals and needs of health related research.

*Jerome B. Hirsch, Director, to the President*

During Shannon's tenure, NIH has become a center of medical research power. Never before has there been so much in fostering basic and applied medical research. Under Shannon's direction, the NIH has grown in size and stature; their medical and biological research the vanguard of the new science.

No governmental effort, this success has been administered with so much skill and foresight. New patterns will evolve but the germinal center of all our efforts will remain the NIH, the center of the government of man and nature.

*Dr. G. Burroughs Milder, Proctor, Department of State*



**POWER PACKAGE.** The late Rep. John E. Fogarty, whose interest in NIH was almost legendary, enjoys a moment of laughter with Dr. Shannon in this photo taken in 1961.

# ...Quality...Vision...Integrity—

## Peagues and Friends



Hubby greets Dr. Shannon as Surg. William H. Sebrell, Jr., retiring NIH retiring. Marion B. Folsom took office became NIH Director, Aug. 1, 1955.

ubt that the single most significant eene of the last 20 years has been ools on Federal grants-in-aid for d that our schools are the stronger w dependent on it for their actual

only hope for the continuation of annon has provided.

H. Luckey, President, Hospital-Cornell Medical Center, resenting Dr. Shannon the Abraham Award

Dr. Shannon at work and came to e, the creative scientist, the dreamer, tor, the manager and the politician, once. Furthermore, he understood

search stems from his deep knowl- st people Dr. Shannon appreciates medical research and teaching and ther. Most important, he worked ongressional understanding of the arch.

Wiesner, former Special Assistant sident for Science and Technology

as emerged as the world's greatest e has one institution done so much cal research for the welfare of so the Institutes in Bethesda have grants program has transformed orld over.

ained and of these proportions, h skill, integrity, wisdom and suc- Jim Shannon's NIH must remain s for the understanding and better-

Arthur Kornberg, essor and Executive Head, rtment of Biochemistry, ford University School of Medicine

The medical profession's changing view toward basic research, as differentiated from its traditional dependence on empirical methods, is due in large part to Dr. Shannon through the NIH. His influence as a scientist and as a leader of scientists is strong both here and abroad.

*Citation—  
Rockefeller Public Service Award, 1964*

Speaking for myself and I am sure for this subcommittee, and I believe for the Congress and the country, we are acutely distressed to realize that this may be your last appearance before us in your capacity as Director of the National Institutes of Health. This grieves us deeply. . . .

For the last 13 years or more at NIH, during the development of these Institutes, you have performed something in the nature of minor miracles in Government administration. Your outstanding service and leadership has attracted these extraordinary and brilliant people who have made the NIH an institution without peer.

*Rep. Daniel J. Flood, Chairman,  
DHEW-Labor Appropriations Subcommittee  
Hearings, March 14, 1968*

The most significant element of the Shannon Era has been Shannon. Somehow he has found the time and energy to involve himself directly and personally in almost innumerable decisions, both large and small, so that almost everything that has happened bears his imprint in one way or another.

At the same time he has fostered scientific freedom and encouraged individual initiative to an extent almost unique in the governmental organization.

*Dr. Kenneth M. Endicott, Director,  
National Cancer Institute*



**MEETING OF MINDS.** Dr. Shannon talks with Rep. Melvin Laird, House Appropriations Subcommittee member, outside Building 1 in 1959.

I have had the opportunity of knowing Dr. Shannon for a good many years. . . . The National Institutes of Health has served various purposes, the most important of which was to seek through research the cure and causes of disease.

But the NIH has also made possible the medical educational program we have in the United States through the very understanding administration of Dr. Shannon and the Directors of the various Institutes. . . . I think that Dr. Shannon through the work he has done and the leadership he has given this agency is deserving of highest praise, not only of the Congress, but of every citizen in the United States.

*Rep. Melvin Laird,  
DHEW-Labor Appropriations Subcommittee  
Hearings, March 14, 1968*



**ROCKEFELLER AWARD.** Dr. Robert F. Goheen, President of Princeton University (left), gives Dr. Shannon his Rockefeller Public Service Award in 1964. With them is John D. Rockefeller, 3rd.

Jim Shannon, the Director of the National Institutes of Health, is a medical and scientific phenomenon, one vitally important to all of us. . . . To him we owe some of the most important overall policy changes in medical education and research. . . . I have said enough to indicate that Jim Shannon is a pretty special sort of man! I have been on the lookout for many years for paragons and have found few, but he is as close as any I have seen.

*Irvine H. Page, Editor,  
Modern Medicine, Dec. 19, 1966*



**PRAISE FROM THE CHIEF.** The President called Dr. Shannon and I/D Directors "my Chiefs of Staff" in the war on disease, citing advances at "the world's greatest research enterprise" during his 1967 visit.

## Physical Growth of NIH During '55-68 Mirrors Vigor of Shannon Era

When Dr. James A. Shannon was appointed NIH Director in 1955, a nine-hole golf course still covered part of the Bethesda reservation grounds.

The golf greens are gone now. Today, the only golf balls visible are hit by players occasionally practicing near the National Library of Medicine.

The physical growth of NIH has been one of the features of the recent past. In Dr. Shannon's early days NIH buildings numbered 27, with a gross square footage of approximately 2,652,384. Now there are 38 buildings on the reservation, plus the Animal Center at Poolesville, with a gross square footage of 6,133,044.

NIH personnel have increased from the 5,412 employed in 1955 to the 13,445 now employed, of whom 11,600 are located on the reservation. These include 1,936 with doctoral degrees, compared with 665 in 1955.

### Clinical Center Annexes

More recently, three new annexes were added to the south side of the Clinical Center—a cafeteria seating 650 people; a modern Library, twice the size of the old one and an addition to the D Wing, mainly providing more space for patient services.

The NCI Virus Isolation Facility, Building 41, is being completed, to be followed by Building 34, a refrigeration plant. The Virus building is a special facility built to enable scientists to extend studies of viruses as possible causes of cancer.

September should also see the completion and beginning occupancy of the largest single project now underway: the NCI-NIMH/NINDB complex of a cafeteria building and two laboratory buildings.

The last of the projects now under construction, the General Office



Dr. and Mrs. Shannon enjoy a rare moment of relaxation in their home seemingly far removed from the normal crush of NIH affairs.

Building Extension, 31C, is expected to be finished in December.

All of the foregoing means that over 900,000 square feet of new space will become available on the reservation during 1968.

Elsewhere, the Division of Environmental Health Sciences, at Research Triangle Park, N.C., was established in 1967, and a laboratory building for the NICHD Gerontology Research Center was completed in Baltimore in 1968.

### Rental Space Occupied

The Bureau of Health Manpower, added this year, occupies rented space in Arlington, Va., and Bethesda. Since 1955, NIH also has begun occupying rented space in nine other buildings in Bethesda, and Rockville, Md.

NIH maintained international offices for some years during Dr. Shannon's tenure in Paris, Rio de Janeiro, and New Delhi, and began operating field units in Panama, Puerto Rico, and Guam.

Seven domestic field units of NIH were established during his years in office, and others were expanded or enlarged.

## STATUS

(Continued from Page 1)

portant changes in scope and depth of the research approach to solution of the Nation's health problems.

Increasingly, this approach sought to meet needs as they developed, to take advantage of newly perceived opportunities, while at the same time never slighting pursuit of the fundamental knowledge on which all advance is made.

To meet the need for modern laboratories and equipment for the expanding and increasingly sophisticated science that developed after World War II, the Health Research Facilities Construction program of matching grants was developed.

### Developed Regional Resources

When it became apparent that some kinds of investigations required resources suitable for utilization by scientists from more than one institution, the concept of regional centers was developed and put to use in, for example, the regional primate centers program.

The center concept for clinical research, originally developed in the NIH Clinical Center, was further developed by the national program of support for general clinical research centers.

Other measures developed or expanded to meet changing needs were the research training programs established in addition to already existing fellowship grants, and the effort through research career awards to provide more stable support for unusually gifted individual investigators.

The emerging need for greater flexibility for grantee institutions in administration of their research was met by general research support grants and health science advancement awards.

The importance of taking advantage of research opportunities wherever they arose, if they prom-

## RECEPTION

(Continued from Page 1)

rector of research programs you have been a man of courage and foresight—you have had 'guts,' Dr. Masur said.

"We admire you because you have had a special talent for the synthesis of scientific, philosophic, and political understanding in the advancement of biomedical research. . . ."

"We are grateful to you because what you did prospered. The scientific community prospered because you possessed the power of thinking before you acted—and the power of acting, too."

Surgeon General William H. Stewart presented Dr. Shannon with an Assistant Surgeon General's flag.

ised benefit to the health of the American people, and of increasing the research manpower pool whereby foreign nations would be able to meet their own research and teaching needs, led to a modest program of international research grants and a somewhat expanded foreign fellowship program.

Some of these programs required establishment of new organizational entities within the NIH.

Others required changes in and expansion of programs in the ex-



HAPPY OCCASION. Dr. Shannon chats with Sen. Lister Hill (center) and DHEW Secretary Abraham Ribicoff at dedication for Building 30 in 1961.

isting Institutes. Examples of the latter are the practice of naming special Task Forces to determine whether research in a particular area has reached a point where further development is warranted, and if so, in what direction; and establishment of collaborative programs whereby a very broad field is explored by an Institute's own scientists together with scientists supported by grant or contract in collaborating institutions, such as the NINDB Collaborative Perinatal Project and the NIAID Vaccine Development Program.

In sum, the development of NIH during the Shannon years was not based on the simple addition of more funds and more people for more research, but rather has been a selective and administratively creative accommodation of scientific resources to social purpose.



BUILDING FOR THE FUTURE. Surg. Gen. Luther L. Terry, Boisfeuillet Jones, and Dr. Shannon compare notes with Clifford F. Johnson, Director of Information, at the 1962 dedication of Building 31, one of the 18 structures added to the NIH complex during Dr. Shannon's years as Director.

**DR. SHANNON***(Continued from Page 3)*

targeted opportunity may seem, these activities should be superimposed upon a continuation of fundamental inquiry.

"Let me make two points," Dr. Shannon continued. "First, targeted research, essential as it is, is the most hazardous of all research. Nonetheless, and however important the problem is that is to be solved, social importance cannot be substituted for an adequate science base in determining the nature and scope of a targeted program.

"Second, a broad and vigorous science base is essential. Committees and organizations, though they are useful for many purposes and essential for others, do not generate novel ideas. They are useful to promote and regulate, but generally not to innovate.

"The revolutionary advances in the next decade will without doubt



**SHANNON TRADEMARK.** The bow tie is obvious in this happy 1968 photo. Dr. Shannon, NIH Director since 1955, will retire Aug. 31.

be made as the result of individuals' work and individual ideas, broadly supported so as to extend greatly the capacity of the individual. This will no doubt be the only base for productive activity of a more formally organized program."

Flexibility, notable in his own career, will continue to be important to science, Dr. Shannon said. Asked what advice he would give a young scientist starting out today, he said:

**Science Background Specified**

"For the biomedical sciences today, and certainly tomorrow, he must secure a broad background in the physical sciences and mathematics.

"He must select an environment that to him is stimulating and exciting, but which also gives him personal options as to what he can do.

"Most important, however, pro-saic it may sound, he must press hard and work hard, but be willing to shift fields radically in response to changing opportunity.

"A lifetime in a single field, un-

**SHANNON THE MAN****Clash of Wits, Basket Fires Often Marked Morning Staff**

*By Joseph S. Murtaugh, former Director, Office of Program Planning*

During 12 years that I spent at NIH it was my good fortune to be able to serve among a truly extraordinary group of men. My closest associations were with individuals who comprised the staff of the Office of the Director. The full dimensions of the exceptional attributes that characterize the leadership of NIH and its programs are centered in Jim Shannon, truly a titan amidst titans.

A more distant vantage point, keener perception, and greater eloquence than mine are needed to provide a proper portrayal of this man. The essential ingredients, however, are clear to all who have encountered Jim Shannon in his pursuit of the business of NIH.

**Benefit to Nation**

That a man with his qualities did come to the National Institutes of Health in 1955 is an event that has had great benefit to the sciences and to the Nation.

But this is Dr. James A. Shannon, the Director of NIH and the public official, not Jim Shannon the boss and fellow worker. It is the latter that most of us have encountered and of whom we have formed our view. The descriptions of this individual doubtless are as many as there are those who have worked with him.

My own images derive mostly from participation in the meetings of the senior staff three days a week, each of which was an instructive, sometimes exasperating, frequently exciting, and always fascinating experience.

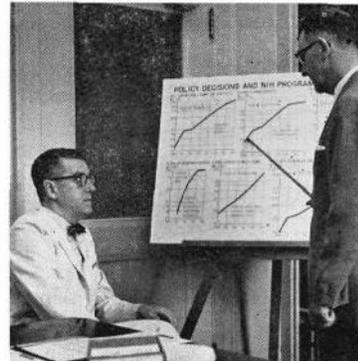
The O. D. Morning Staff convenes around the conference table in the Director's office to consider

less very broad, must be very dull. I've never encouraged the 'beating' of a dead horse."

Dr. Shannon will be succeeded as Director by Dr. Robert Q. Marston, former Associate Director of NIH for Regional Medical Programs, and more recently Administrator of the Health Services and Mental Health Administration.



**SHOP TALK.** An informal session brings together Dr. Shannon and three top associates for a discussion of NIH policies and procedures.



**YEARS OF DECISION.** Dr. Shannon surveys policy and program advances on charts displayed by Joseph S. Murtaugh about 1960. Line on each chart showing upturn of activity or support, began with "year of decision" during Shannon Era.

the portending needs, opportunities and evils of the day.

The burden of the agenda and the detailed conduct of business is borne by the Deputy Director. But of course, the real determiner of the sequence of events has always been Jim Shannon.

Jim, more often than not arriving after considerable business had been transacted, would be filled with new ideas and new directions, and would disperse to the winds the careful but more pedestrian efforts of the staff.

Frequently, major digressions would follow, with Jim at the blackboard in his favorite pedagogical stance. From such seemingly irrelevant excursions often emerged an imaginative new program concept or a strategical plan whereby the enemy might be thwarted and the forces of good prevail.

These staff meetings were enlivened in many ways. For the most

part, the excitement came from the clash of wits as new ideas were forged and courses of action debated. Frequently, an extra element of excitement was added by the famous Shannon waste basket erupting in flames as a consequence of his discarding an unsmuffed cigarette into the crush of paper.

This became such a common experience that Jim or one of the others would pick up the basket, deposit the burning contents in the lavatory toilet and return to the table without interrupting the exchange of argument.

**Natty Bow Ties**

Although Jim Shannon, with his well-combed, iron-gray hair and his natty bow tie, typically is as well-groomed as anyone, he often has a remarkable indifference to the state of repair of his clothes. A bursting shirt seam or an incipient parting in the seat of his trousers may be worn with total unawareness.

Once, Dr. Shannon was being posed for a series of casual photographs by a professional medical news magazine. One of these pictures of Jim, leaning in characteristic thoughtful pose on his right hand, was considered by the magazine to be worthy of cover presentation. At the last moment, however, scrutiny revealed that the shirt cuff prominently displayed in the picture was held together by a



**MARCHING ONWARD!** Dr. Shannon and Surg. Gen. William H. Stewart flank the President on July 21, 1967, as they stride into the Clinical Center auditorium. Mr. Johnson praised NIH as a "billion dollar success story."

straight pin!

It seems that all administrators have one device in which they put the greatest store. In the case of Jim Shannon this device was the "staff document." It was an article of faith with him that the way into and out of any problem, big or little, was through a "staff document."

The preparation of a "staff document" was either demanded or promised by Jim in almost every important policy or program negotiation. The net consequence of this was the generation of staff papers on almost every conceivable subject.

Perhaps one of the most remarkable

*(See THE MAN, Page 12)*

### Dr. Watzman Appointed Grants Associate, DRG

Dr. Nathan Watzman, former associate research professor of Pharmacology at the University of Pittsburgh, has joined the NIH Grants Associates Program.



Dr. Watzman

The program, administered by the Division of Research Grants, prepares selected scientists for administrative positions in extramural research activities.

Dr. Watzman received his Ph.D. degree (neuromuscular pharmacology) in 1961, an M.S. (cardiovascular pharmacology) in 1957 and B.S. degrees (pharmacy and psychology) in 1955 and 1947, all from the University of Pittsburgh.

#### Experience Cited

From 1947 to 1949 he attended the University of Pittsburgh Law School, and from 1949 to 1951 studied accounting and taxes.

Dr. Watzman held teaching positions from 1959 to 1962 at the Northeast Louisiana State College School of Pharmacy. He also was chairman of its Department of Pharmacology until he joined the University of Pittsburgh in 1963.

Dr. Watzman's research interests have focused on psychopharmacology and the central nervous system, including the effects of psychotropic agents on instinctive and learned behavior, and the evaluation of potential psychoactive compounds.

### Red Cross Volunteer "Teens" Lavish TLC on Patients in CC Nursing Units

Again, this summer, a group of Red Cross "Teens" are helping to take care of patients in the Clinical Center nursing units.

The program, which started last year, uses the services of teenagers who are members of the Junior Red Cross Hospital Volunteers. Most of them are high school students.

Other volunteers from the Junior Red Cross work in various departments of the CC.

#### Students Take Tour

Students who trained for the nursing department were given an orientation course and a conducted CC tour. They were welcomed by Louise C. Anderson, chief, CC Nursing Department. The training was under the direction of Irma Monlux, chief training officer of the Education and Training Section.

The volunteer students were taught such essential hospital procedures as making beds, the proper way of serving food and liquid to patients, and were inculcated in the importance of accurate measurement of a patient's liquid intake.

The students were also instructed in methods of playing with child patients, and understanding them.

Each student volunteer works 2



A puppet show is just one of the many ways "Teens" entertain young CC patients in their playroom. The area students staging the performance are (l to r): Cheryl Victorian and Laura and Helen Krieg.—Photo by Tom Joy.

days a week for 6 hours a day. They wind up their duties on Labor Day. Mrs. Genevieve Rush of Annandale, Va., a Red Cross Hospital Volunteer, is in charge of the Teen program.

#### Government Code of Ethics

Any person in Government service should:

Engage in no business with the Government, either directly or indirectly, which is inconsistent with the conscientious performance of his governmental duties.

### RML Host to Internatl. Northwest Conference

The 23rd annual meeting of the International Northwest Conference on Diseases in Nature Communicable to Man is now meeting until tomorrow, in Hamilton, Mont.

This is the third time the Rocky Mountain Laboratory, National Institute of Allergy and Infectious Diseases, has acted as host for the conference.

Three RML staff members—Drs. Glen Kohls, C. B. Philip, and William Jellison (retired)—are taking an active part in this year's meeting, at which registration is expected to reach 100.

The annual R. R. Parker Memorial address is being given by Dr. Wilbur G. Downs, Department of Epidemiology and Public Health, Yale University School of Medicine.

The address was established in 1951 in honor of the late former director of the RML.

Deaths from hypertension have been cut in half since anti-hypertensive drugs were introduced a little more than a decade ago, Asst. Secy. Philip R. Lee told a medical audience recently.

Deaths from tuberculosis have been reduced 30 percent.

### 9 NIH Blood Donors Reach One Gallon or More Mark

The Clinical Center Blood Bank reports that 265 units of blood were received from NIH donors in July, and CC patients received 2,181 units of blood.

Nine donors achieved a special status: Howard M. Biggs, DRS, reached the 5-gallon mark; Dr. David L. Madden, NICHD, the 2-gallon mark.

Dr. George E. Garrington, NIDR, Dr. George G. Glenner, NIAMD, Ruth D. Liston, DRG, Robert Mehnert, NLM, John M. Miller, NCI, and J. Michael Poston, NHI, joined the Gallon Donor Club.

Also, Dr. Thomas D. Dublin, a State Department staff member who is a regular donor at the CC Blood Bank, reached the gallon mark.

Make an appointment to donate blood today. Call Ext. 64506.

### CARE to Send Milk for Hungry Children, Victims Of Nigeria-Biafra War

Five thousand cases of high-protein fortified canned milk, purchased with CARE funds, are being sent to children who are victims of the Nigeria-Biafra war.

The children are suffering from Kwashiorkor, a protein deficiency disease. The milk is being sent from CARE stockpiles in Liberia.

CARE has also designated additional funds, for other nutritional needs, to aid war victims. The International Committee of the Red Cross will distribute supplies to the population in the affected areas.

It was estimated that about 1,500,000 persons in government-held territory and Biafra require help. A special CARE fund has been established for war victims.

Contributions may be sent to: Nigeria-Biafra Emergency, CARE, 1028 Connecticut Ave., N.W., Washington, D.C. 20036.



Under the Youth Opportunity Program, members of the Owens family have spent a total of 8 summers working at NIH. Twins Harry (left) and Jerry, age 18, are seniors at Poolesville (Md.) High. They are two of the reasons their school's track team won so many championships. Their cousin Willie is putting in his fourth summer here, and will become a full-time employee in the fall. Willie, who has sung in several choruses while at Poolesville High, hopes to become a professional singer and will be taking voice and instrumental lessons after working hours.—Photo by Lee Bragg.



Mae S. Reed, committee management officer, NCI, is presented a DHEW Sustained High Quality Performance Award by Dr. J. Palmer Saunders, NCI associate director for Extramural Activities.—Photo by Tom Joy.

## NHI Develops Artificial Heart Valve With Jeweled Bearings and an Airfoil

Jeweled bearings and an airfoil are two unique features of a new artificial heart valve now undergoing development and experimental trials in animals at the National Heart Institute.

These tests indicate that the valve, constructed entirely of rigid components, is more durable and less prone to engender blood clots than are other flap valves. Moreover, it offers only half the resistance to forward bloodflow posed by the bulky caged-ball valves in current clinical use.

As in many artificial valves, the new valve has a rigid plastic ring-like valve body that is sewn into place by means of an attached skirt of synthetic fabric.

### Prevents Backward Flow

The valve body contains a central plastic disc as the valve's mobile component. This disc seats against an inner rim in the valve body to prevent backward flow of blood, but swings open in response to forward flow.

Unlike most valves, however, the mobile disc is neither enclosed in a cage nor restrained by inwardly curving struts or "claws." Nor, as in some flap valves, does it flex open by means of a hinge or leaflets of flexible material that can become fatigued and fracture with prolonged use.

Instead, the disc is attached to an eccentrically-mounted metal (Vitalium) axle whose conical ends project beyond each edge of the disc. These axle ends pivot in a pair of extremely hard, low-friction bearings consisting of sapphire Vee-jewels mounted inside the valve body.

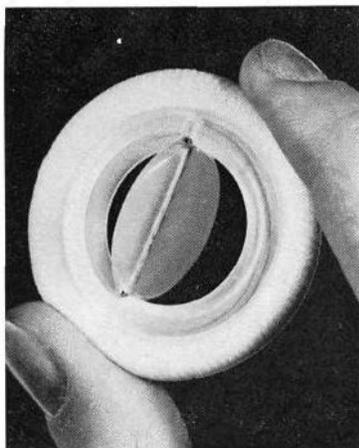
### Pivot Points Important

To eliminate areas of relatively "stagnant" flow, and the consequent likelihood of blood clot formation, the pivot points are located precisely in the space between the valve body and the disc where they are exposed to the constant washing action of blood even when the valve is closed.

The eccentrically-mounted axle further reduces the hazard of blood clots because, as the disc swings open, it provides two blood-flow orifices (a major and a minor orifice) that allow each side of the disc to be swept clean.

Earlier models of this valve were equipped with discs of uniform thickness and opened to an angle of only 45 degrees. This was increased to 75 degrees in later models by incorporating an airfoil cross-section into the disc to provide lift in the bloodstream and thereby maximize flow through the valve.

Tests of the valve in a mock circulatory system containing a clear glycerin and water mixture of the same viscosity as blood, showed that the disc opened promptly in response to forward flow, and then



Except for its outer sewing ring or Teflon cloth "skirt," of the artificial heart valve, the hinged flap valve is constructed of rigid components: the ring-like valve body and its mobile flap are of highly polished Kel-F plastic; the flap pivots on a Vitalium (metal) hinge pin set in sapphire Vee-jewel bearings. The valve's flap, the disc shown above in the open position, features an airfoil cross-sectional design that provides lift in the bloodstream to minimize blood-flow through opened valve.—Photos by Lee Bragg.

closed just as promptly without "chattering."

Compared to the largest ball valve that could be inserted into the test system, the new valve presented only half the resistance to forward flow at various flow rates up to 20 liters per minute.

Fatigue studies revealed no sign of wear after 20 million cycles with an early model of the valve.

### Films Show Patterns

High-speed motion picture studies of flow patterns, made visible by adding a suspension of bentonite (a clay) to the system and viewing it under polarized light, showed that flow occurred through both the major and minor valve orifices. The flow about the disc was reasonably laminar. This is a desirable feature because excessive turbulence is known to damage blood cells.

Various models of the valve were used to replace the tricuspid valve in nine calves. This is a very rigorous test of valve function even for clinically proven designs.

Although tissue growth encroaching on disc mobility was a major problem in the first four valves tested, this, and other problems were greatly reduced in later implantations by changing the hinge assembly, sewing skirt, and the use

## Latest Participants in NIH Visiting Scientists Program Listed Here

7/1—Dr. David R. Redwood, England, Cardiology Branch. Sponsor: Dr. Stephen Epstein, NHI, Bldg. 10, Rm. 7B14.

7/1—Dr. Josef Sandula, Czechoslovakia, Medical Mycology Section. Sponsor: Dr. H. F. Hasenclever, NIAID, Bldg. 7, Rm. 201.

7/1—Dr. Marcel Roberfroid, Belgium, Laboratory of Chemical Pharmacology. Sponsor: Dr. James R. Gillette, NHI, Bldg. 10, Rm. 8N118.

7/3—Dr. Antony D. Kidman, Australia, Laboratory of Preclinical Pharmacology. Sponsor: Dr. Erminio Costa, NIMH, St. Elizabeths Hospital.

7/5—Dr. Konstantin A. Hossmann, Germany, Section on Comparative Neuropathology. Sponsor: Dr. Igor Klatzo, NINDB, Bldg. 10, Rm. 4N242.

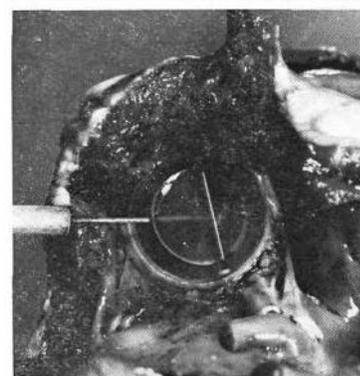
7/5—Dr. David T. Kelly, New Zealand, Cardiology Branch. Sponsor: Dr. Stephen Epstein, NHI, Bldg. 10, Rm. 7B14.

7/5—Dr. Kin-ichiro Miura, Japan, Laboratory of Biology of Viruses. Sponsor: Dr. Norman P. Salzman, NIAID, Bldg. 10, Rm. 11N240.

7/8—Dr. Chaviva Isersky, Israel, Section on Histochemistry. Sponsor: Dr. George G. Glenner, NIAMD, Bldg. 10, Rm. 3N112.

7/10—Dr. David A. East, England, Clinical Endocrinology Branch. Sponsor: Dr. Frederic Bartter, NHI, Bldg. 10, Rm. 8N214.

7/11—Dr. Yoichi Kondo, Japan, Clinical Endocrinology Branch. Sponsor: Dr. Jacob Robbins, NIAMD, Bldg. 10, Rm. 8N315.



Successful experimental results were obtained by modifying the valve's hinge assembly and sewing skirt, and by administering anticoagulant drugs to animals in which the valve was tested. These changes were incorporated in the valve, 10 weeks after implantation in a calf. The valve, clean and fully functional, is entirely free of blood clots and tissue growth.

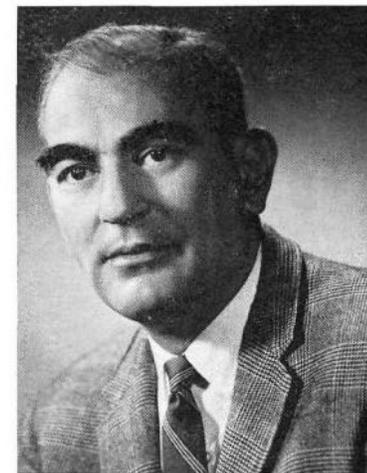
of anticoagulant drugs.

Following these changes, the new hinged valve functioned as well as

## Dr. Sober Named Chief Of NIAMD Laboratory

Dr. Herbert A. Sober was recently named chief of the Laboratory of Nutrition and Endocrinology of the National Institute of Arthritis and Metabolic Diseases. Dr. Sober will replace Dr. John Keresztesy, who retired in March. Dr. G. Donald Whedon, Director of NIAMD, announced the appointment.

Previously, Dr. Sober was chief, Laboratory of Biochemistry in the



Dr. Sober will direct biochemical studies that include the influence of the nervous system on endocrine glands.

National Cancer Institute, specializing in isolating protein molecules.

Under his direction, the NIAMD Laboratory will continue examining changes caused by nutritional deficiencies in such organs as the liver and pancreas, interrelationships between hormones, and influences of the nervous system on the endocrine glands.

Dr. Sober earned a Ph.D. in biochemistry at the University of Wisconsin, and received a post-doctorate fellowship there in 1942. At the University he studied biochemical approaches to metabolic and nutritional problems.

Dr. Sober came to NCI in 1949. Previously, he had been at Mt. Sinai Hospital in New York, where he was a senior assistant scientist.

He has recently retired from the USPHS Commissioned Officer's Corps, after 21 years of service.

or better than clinically available disc- and ball-valves used in the calf tricuspid position.

The preliminary tests suggest that the new valve will overcome certain disadvantages while improving the performance characteristics of previous valve designs.

The findings on the laboratory and animal tests of the valve were made by Drs. William S. Pierce, Douglas M. Behrendt, and Andrew G. Morrow, of NHI's Surgery Branch.

## NIAID Adds New Unit—Infectious Diseases Lab.

Expanding research on viruses and viral diseases at the National Institute of Allergy and Infectious Diseases has led to the establishment of a new unit—The Laboratory of Infectious Diseases.

Dr. Robert M. Chanock was named chief of the laboratory. He has been a PHS Commissioned Officer and a member of the NIAID virology research staff since 1957. His appointment was announced by Dr. Dorland J. Davis, NIAID Director.

### Has Two Sections

LID will be divided into two sections: respiratory viruses, which Dr. Chanock will also head, and epidemiology, headed by Dr. Albert Z. Kapikian.

Investigators in the new laboratory will study the epidemiology, prevention, diagnosis, and treatment of infectious diseases caused by viruses, mycoplasmas, and related organisms.

The staff will also investigate the development of acute respiratory, intestinal and liver infections, the role of genetics and environmental factors, and the mechanisms of host resistance to disease.

## Dr. Melville Pres.-Elect Of American Association Of Clinical Chemists

Dr. Robert S. Melville, assistant chief, Clinical Applied Sciences Section of the Research Grants Branch, National Institute of General Medical Sciences, assumed office as president-elect of the American Association of Clinical Chemists on July 1.

He will become president in 1970.

Established in 1948, the association is a professional organization of 1,700 members concerned with the application of chemical knowledge to problems in human physiology and the prevention, diagnosis, and treatment of disease.

The Association's 1968 meeting is now in progress until Aug. 23 at the Washington-Hilton Hotel.

### Background Noted

Dr. Melville received his A.B. degree from Clark University in 1937, and his Ph.D. in biochemistry from the State University of Iowa in 1950.

Prior to joining NIH in 1966, Dr. Melville held important clinical and research posts with the Veterans Administration and private hospitals.



Dr. Melville



**WARTIME SERVICE.** Dr. Shannon (right, at end of table), served as Consultant on Tropical Diseases to the Secretary of War, 1942 to 1946. He is shown with other members of the Board for Coordination of Malarial Studies.

## THE MAN

(Continued from Page 9)

able experiences in working with Jim Shannon is the process of writing his speeches. Jim is always at his best speaking extemporaneously and responding to the immediate situation. He has little taste for reading a prepared speech, particularly one involving a subject in which he is not really interested, or which does not provide an opportunity to advance NIH.

### Sought-After Speaker

Jim's stature and position have brought him many invitations to speak, but he has the tendency to accept more obligations than his calendar and responsibilities will permit.

While preparation of a speech always starts with a discussion between him and the writer concerning the subject and the point of view to be expressed, Jim tends to avoid coming to grips with the specific content until the last moment, despite preparation of outlines and drafts by staff well in advance of the delivery date.

If Jim considers the occasion sufficiently important to worry about what he says there often is a frantic last-minute re-writing, frequently in a manner and in a direction which bears no resemblance to the carefully labored draft he has put off reviewing.

### Likes to Ad Lib

More unsettling, however, is an inclination to accept as drafted a speech to be delivered on an occasion he considers perfunctory or ceremonial, without his having given serious thought to the matter contained therein.

Sometimes he reads such a speech as though he has never seen it before, and may even take ad lib issue with the prepared text, as though he had had no part in the original formulation of the ideas.

These performances, however, are almost always redeemed by a brilliant improvisation generated by the immediate circumstances in which the speech is delivered.

This rare ability to make penetrating observations, spin wondrous

ideas, and generate visions of new opportunities, all on the spur of the moment, is among the qualities that make Jim Shannon a much sought-after speaker and a respected and admired boss, an extraordinary person building an extraordinary institution.



**MAN IN A HURRY.** Dr. Shannon uses the radio in an official car in this 1956 Disaster Plan Alert photo.

## Dr. James Long Named Associate Chief, BHM

Dr. James W. Long has been appointed associate chief of the Physician Supply and Utilization Branch of the Division of Physician Manpower, Bureau of Health Manpower. Dr. Frank Wray McKee, Division Director announced the appointment recently.

The Division of Physician Manpower concentrates on programs dealing with the education, supply, and utilization of physicians in the United States. The Branch is concerned with the development of valid information on physician resources.

Dr. Long, an internist, joined the Federal Service in 1965. He has served in the Bureau of Medicine of the Food and Drug Administration, and on the staff of the Toxicology Information Program of the National Library of Medicine.

Dr. Long received his M.D. degree from the George Washington University School of Medicine in 1943 and served his internship and

## Lesch-Nyhan Syndrome Exhibit Shown at AMA Meeting by NIAMD

A National Institute of Arthritis and Metabolic Diseases exhibit on Lesch-Nyhan syndrome was among the scientific features at the recent American Medical Association meeting in San Francisco.

Reprints explaining the exhibit were depleted before the end of the first meeting day, and requests from physicians for more information concerning the disease are still arriving at NIAMD.

The exhibit, "Enzyme Defect Linked to Neurological Disorders and Excessive Purine Synthesis," was built shortly after NIAMD scientists identified the enzyme deficiency associated with the disease.

### Is Familial Disease

Lesch-Nyhan syndrome is a recently discovered familial neurological disease that, in the past, was frequently classed as "cerebral palsy." Children appear normal at birth, but do not develop normally.

They soon begin showing mental retardation, choreoathetosis, and eventually aggressive behavior and self mutilation in which they bite away their lips and fingers.

This curious neurological and behavior disorder with a biochemical abnormality, was first found in two brothers by Dr. William L. Nyhan and Dr. Michael Lesch at Johns Hopkins Hospital in 1964.

They reported that these children produced six times more uric acid than normal for their body weight—and much more than any other human being.

Since gout (characterized by excessive production or accumulation of uric acid) has been under intensive study by NIAMD, Institute scientists investigated the newly discovered Lesch-Nyhan syndrome.

They thought that finding the basis for the excessive uric acid in these children might lead to the biochemical derangements responsible for excessive uric acid formation in some gouty patients.

### Enzyme Defect Found

Within 9 months, NIAMD scientists had identified the enzyme defect in these children. An enzyme of purine metabolism, hypoxanthine-guanine phosphoribosyl-transferase (PRTase) was absent from their cells.

These findings also provided new insight into the metabolic derangement in some patients with gout.

Additional evidence shows that gouty arthritis may be the end result of a variety of basic biochemical and physiological abnormalities that have in common the production of hyperuricemia.

residency training in the Emergency Hospital (now a component of the Washington Hospital Center).