ARMY RESEARCH AND DEVELOPMENT

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rmy Announces Choice of 28 R&D Achievement Award Winners

President Names Vance As Successor to Stahr

Appointment of Cyrus Roberts Vance as the new Secretary of the Army, upon resignation of Elvis J. Stahr, jr., to become President of Indiana University, effective July 1, was announced May 21 by President Kennedy. Vance has served as General Counsel, Department of Defense, since Jan. 29, 1961.

President Kennedy, in reply to Secretary Stahr's formal letter of resignation, stated in part:

". . . Your conduct of Army affairs has been an outstanding example of good management. Your policies of recognition of young talent, of ex-

(Continued on page 4)

Cyrus R. Vance
Secretary of Army

Judges selecting the second annual Army Research and Development Achievement Award winners ran into a tough problem—and took the easy way out. Instead of limiting choices to 10 awards, they made 15 awards recognizing a total of 28 individuals.

When the time came to narrow the field of those who will receive honorary plaques and lapel pins for outstanding technical achievement, the judges decided that too many nominees had performed notable work of almost equal significance to military requirements. Accordingly, it was held proper to recognize all achieve-

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500 Scientists to Meet At Biennial Conference

Deputy Under Secretary of the Army (Manpower) Alfred B. Fitt will pinch-hit for Secretary Elvis J. Stahr, jr., by taking part with 500 invited scientific leaders in the Army Science Conference. The United States Military Academy, West Point, N.Y., will be host for the June 20-22 meeting.

Prior to announcement of his resignation to become President of Indiana University, effective July 1, Secretary Stahr had accepted an invitation to

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16 Army Winners in National Science Fair International

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Army R&D Newsmagazine

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Purpose: To improve informal communication among all segments of the Army scientific community and other Government R&D agencies; to further understanding of Army R&D progress, problem areas and program planning; to stimulate more closely integrated and coordinated effort among the widely dispersed and diffused Army R&D activities; to maintain a closer link from top management through all levels to scientists, engineers and technicians at the bench level; to express views of leaders, as pertinent to their responsibilities, and to keep personnel informed on matters germane to their welfare and pride of service.

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Theme of the Month: Ground Mobility

**By Richard C. Kerr, Chief Scientist
U.S. Army Transportation Corps**

In an age when airplanes are flying far beyond the speed of sound and space vehicles are rounding the earth in 90 minutes, it becomes difficult to sustain interest in the development of the relatively slow earth-bound vehicle.

Military leaders who declare that true mobility can be achieved only by taking to the air, however, are also quick to admit that the battle's final outcome still will depend upon the ground soldier's ability to seize and occupy territory. This requires mobility of a different type than that represented by the airplane or space vehicle.

Watching a ground vehicle successfully traverse a previously impassable quagmire may not give the young engineer-designer a thrill comparable to that of watching a missile lift off the launching pad. But it can provide a tremendous sense of accomplishment. The field of ground mobility research is perhaps more challenging today than at any time in history and its adherents are steadily increasing in number.

The soldier and his supporting supplies may arrive in the battle area by ship or airplane, but some variety of ground transportation will still be required in the immediate area of the objective. It is this type of ground mobility which has concerned military men since the dawn of civilization. The Roman legionnaire marched at 2½ miles per hour. Later, the horse broke the "foot barrier" and, in turn, was supplanted by the motor vehicles of World War I which, on occasion, attained the then fabulous speed of 20 m.p.h. By World War II, ground mobility could be stepped up to 35 or 40 m.p.h. in on-road operations, leading many to believe that the ultimate in ground mobility had been achieved.

New worlds of ground mobility remain to conquer, however, for mobility is not always a matter of speed alone. Both movement and load carrying capacity are needed for any fighting environment, and the varying problem offers no simple answer to the type of machine that will be required. Mobility means many things to many people. It is not always expressed in terms of speed, payload and range. Sometimes, it is merely the capability to move into and out of places where the enemy can not—the speed of movement frequently being of subordinate consequence. I refer, of course, to "off road mobility," a capability of the utmost importance to the modern Army.

"On highway" thinking has dominated the field of ground mobility for more than 60 years. So advanced has been development in this area that today, only minor improvements seem attainable. When one considers the fact that nearly every family owns an auto and daily sees thousands of trucks in use on our highways, this is not particularly surprising.

This propensity for designing for the highway, however, has had the effect of retarding progress in developing vehicles for off-road use. The field is so

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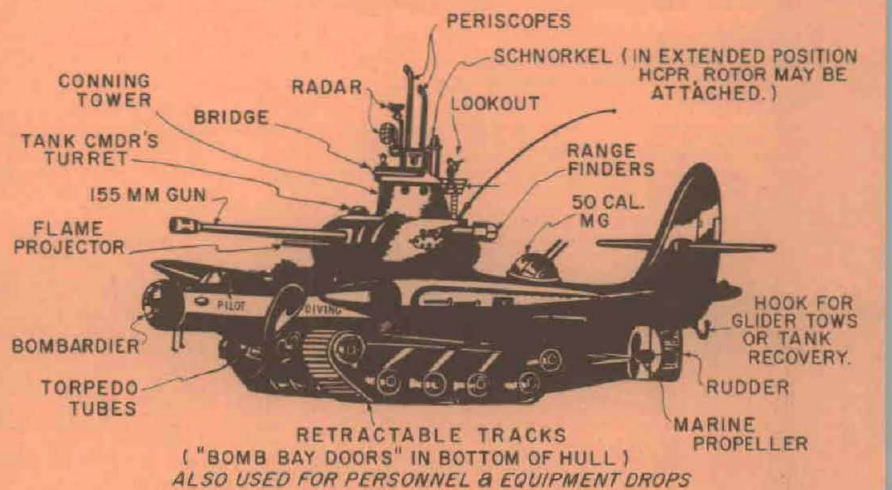


UNIVERSAL SHIP AIRCRAFT VEHICLE

SPEED: LAND - 50 MPH
SEA - (SURFACE) 30 KNOTS
(SUBMERGED 20 KNOTS
AIR - 700 MPH (W TAIL WIND)

RANGE: LAND - 1,000 MILES
SEA - 25,000 MILES
AIR - NO LIMIT

COST: WILL SAVE THE GOVERNMENT MILLIONS!!

500 Scientists to Attend Army Science Conference, June 20-22

(Continued from page 1)
present awards to authors of prize-winning scientific papers.

Ninety-six papers, chosen from more than 400 proposals, will be presented. Four non-competitive papers will be given by guest speakers.

Dignitaries invited to attend include Dr. Jerome B. Wiesner, Special Assistant to the President for Science and Technology; Alfred B. Fitt, Deputy Under Secretary of the Army (Manpower); Dr. James H. Gardner, Deputy Director of Defense Research and Engineering; and Wilbur S. Hinman, Jr., Assistant Secretary of the Army (R&D).

American-British-Canadian tripartite cooperation in Army materiel research and development will be reflected by attendance of 15 British and Canadian R&D leaders, including: Dr. Walter Cawood, Chief Scientist, British War Office; Brigadier Joseph A. Fitzpatrick, Defense Research Staff, British Embassy; Brigadier Donald A. G. Waldock, Deputy, Quartermaster General Equipment and Engineering, Ottawa, Canada; and Gordon B. Watson, Defence Research Attache, Canadian Joint Staff.

Chief of Research and Development Lt Gen Arthur G. Trudeau will be in Korea, where he served as CG of the 7th Infantry Division, for a retirement ceremony in his honor shortly before the Conference. If his plane does not return in time for him to make the opening address, Deputy CRD Maj Gen Dwight E. Beach will pinch-hit for him. Academy Superintendent Maj Gen William C. Westmoreland will welcome guests.

Several ranking members of the Army Scientific Advisory Panel are expected to attend as honored guests, including Chairman Dr. Morrough P. O'Brien and Vice Chairman Dr. William Van Royen. Members-at-Large who may attend are Dr. Clifford C. Furnas, Dr. William H. Martin and Dr. Richard S. Morse, former Assistant Secretary of the Army (R&D).

Top ranking military officials scheduled to attend are Maj Gen Rush B. Lincoln, Jr., who recently became Army Chief of Transportation; Brig Gen David B. Parker, Director of Research and Development, Office of the Chief of Transportation; Brig Gen Fred J. Delmore, CG, Chemical Corps R&D Command; Brig Gen W. C. Hall, Director of Research and Development, Office of the Chief of Engineers; Maj Gen James H. Forsee, CG, Medical R&D Command; and Brig Gen Merrill L. Tribe, CG, Quartermaster R&E Command.

Dr. Chris Argyris, Professor of Industrial Administration, School of Engineering, Yale University, is scheduled to make the principal address at the banquet. Director of Research on Problems of Individual-Organization Health, he is the author of numerous articles and books and has served as a Special Consultant in Human Relations to industry and Government.

Dr. Ralph G. H. Siu, Technical Director of Research and Development, Office, Quartermaster General, will be the banquet toastmaster. Popular as a speaker with a rare gift for blending "wisdom with wit," he is the author of the widely read T-Thoughts column in the *Army Research and Development Newsmagazine.*

Dr. Harold C. Weber, Chief Scientific Adviser, Office of the Chief of Research and Development, Department of the Army, will preside as chairman at the general sessions. General chairman of arrangements is Dr. Richard A. Weiss, Deputy and Scientific Director, U.S. Army Research Office.

Four outstanding Army scientists selected to present guest papers (not eligible for prize consideration) are:

- Dr. Marion B. Sulzburger, Office of The Surgeon General, who will discuss "Progress and Prospects in Idiophylaxis (Built-in Selft Protection of the Combat Soldier).
- Dr. Harrison J. Merrill, U.S. Army Signal Corps, whose subject is "Laser Progress and Applications."
- Dr. Bruno Papirmeister, U.S. Army Chemical Center, "Effects of Mustard Gas (H) on T2 Bacteriophage and DNA Synthesis."
- Dr. Carl Lamanna, U.S. Army Research Office, "Problems and Progress in the Study of Oral Toxicity of Bacterial Toxins."

Eight eminent scientists will meet early in June to serve as judges in selecting 30 of the 96 papers presented at the conference for Certificates of Outstanding Achievement. In addition, a number of papers will be chosen for civilian incentive awards or honorariums for military authors contributed by the Association of the United States Army.

Four of the judges are presidents or directors of professional societies and three are members of the Army Scientific Advisory Panel (ASAP). The ASAP is comprised of distinguished educators, scientists and industrialists representative of all parts of the United States.

The judges are: Dr. Paul M. Gross, President, American Society for the Advancement of Science; Dr. John B. Youmans, former Technical Director, Army Medical R&D Command, and now Director of Scientific Activities, American Medical Association; Dr. Flyod S. Daft, Chairman, Federation of American Societies of Experimental Biology and Medicine; Dr. W. O. Milligan, American Chemical Society; Dr. Ralph E. Fadum, Dr. Harwood S. Belding, Dr. Andrew Longacre and Donald Fink, ASAP.

Papers will be presented at four concurrent sessions and will be subject to discussion along with other business. Session chairmen are: Dr. Gilford G. Quarles, Chief Scientific Adviser, U.S. Army Corps of Engineers; Dr. George H. Lee, Chief Scientist, U.S. Army Ordnance Corps; Dr. Maurice J. Murray, Chief Scientist, U.S. Army Chemical Corps; and Dr. Craig M. Crenshaw, Chief Scientist for R&D, U.S. Army Signal Corps.

Accommodations at the U.S. Military Academy limits attendance at the Science Conference to 500. That necessitated the establishing of quotas for each of the Army Technical Services, the U.S. Continental Army Command, and other Government agencies. Numerous requests from industry could not be favorably considered.

Participating in the discussions will be representatives of: U.S. Air Force, U.S. Navy, U.S. Marines, Office of the Director of Defense Research and Engineering, Advanced Research Projects Agency, National Science Foundation, Smithsonian Institution, Weapons Systems Evaluation Group, U.S. Army Reserve R&D Units, Association of the U.S. Army, U.S. of Staff for Logistics, Deputy Chief Army Security Agency, Deputy Chief of Staff for Personnel, Human Resources Research Office, Research Analysis Corp., American Medical Association, and the U.S. Army Mathematics Research Center.

Picatinny Forms Chapter Of Management Assn.

A Picatinny Chapter of the Armed Forces Management Association was established at a recent dinner meeting at Picatinny Arsenal. Rear Adm Thomas B. Neblett, (Ret.) Executive vice president of AFMA, presented the charter to temporary president-secretary, Sidney Sobelman.

Col R. R. Klanderman, Arsenal Commander, indicated that the chapter represented a well diversified management group. Members represent every major division of the Arsenal.

The next meeting in June will feature a top-level guest speaker and election of officers.

Kennedy Lauds Stahr on Army's Recent Progress

(Continued from page 1)

amination and adoption of new doctrines and techniques, and emphasis on virgorous leadership for our Army marks your tenure as Army Secretary.

"In an uneasy period of international tension, under your leadership the Army has effectively performed its mission. The improvements made are important ones; the sacrifices that have been made are appreciated deeply by the American people; and the pride and high esprit of the Army today is more than justified. . . ."

Cyrus Roberts Vance, like the man he will succeed, is young (45) and known for his vigorous, hard-driving enthusiasm for any task he undertakes. These qualities were ably demonstrated in 1957 and 1958 when he served as Special Counsel to the Preparedness Investigating Subcommittee of the Committee on Armed Services of the United States Senate during its inquiry into the satellite and missile programs.

In 1958 Mr. Vance served also as Consulting Counsel for the Special Committee on Space and Astronautics of the United States Senate during the drafting of the National Space Act and the hearings on that Act. In 1959 and 1960 he continued to serve as Special Counsel to the Senate Preparedness Investigating Committee.

As General Counsel of the Department of Defense, Secretary-designate Vance established a reputation for almost tireless energy—12 to 16 hours of work a day, six and sometimes seven days a week. Prior to his duties with the Government, he was a partner in the law firm of Simpson, Thacher & Bartlett, New York City.

Four years of service in the United States Navy followed Mr. Vance's graduation from Yale Law School in 1942. He served in destroyers in both the Atlantic and the Pacific and was separated from the service as a lieutenant. Born in Clarksburg, W. Va., Mar. 27, 1917, he was graduated from Kent School and received his B.A. degree from Yale in 1939.

Mr. Vance is married to the former Grace Sloane and has five children. He is a trustee of Kent School, the Boys' Club of New York, and Director of the Union Settlement Association, Inc. He is a member of the American Bar Association, the New York State Bar Association and the Association of the Bar, City of New York.

Assistant Editor Wanted

Applications are being considered for the position of Assistant Editor, GS-11, for the Army Research and Development Newsmagazine. Only those having Federal Civil Service Career Status, or within reach on a Civil Service register, should apply.

Preferably, applicants should be graduates of college journalism schools and have two or more years of practical newspaper experience on a daily publication, or the equivalent in writing for magazines. Copy desk experience also is desirable.

7,000 Picatinny Employees Participating in Recruitment Campaign

Seven thousand civilian employees at Picatinny Arsenal now hold an additional job—and they're all out to "get their man."

The Arsenal's entire work force was organized recently into a huge employment bureau by Merle L. Day, Civilian Personnel Officer, to help solve critical manpower shortages in engineering fields.

The aid of the Arsenal "recruiters" was requested to help hire badly-needed mechanical, industrial and electronic engineers. More than 50 are critically needed to carry out the Arsenal's research activities.

The situation is not new. For the past several years, a shortage has existed in a number of Army installations because of the increased requirement for engineers of this type. The problem is more urgent now at Picatinny due to the installation's expanded mission and increased activities in these particular fields.

Arsenal employment officials are not content to sit back and wait for the prospective employees to come to them. They have launched an intensive program designed to inform job-hunters of the advantages of a career in Government service.

Teams of recruiters are sent to depressed areas where unemployment is high or when they learn that personnel will be available because of industrial layoffs or shutdowns. Preceding their visit, announcements are made in area newspapers or over radio or television stations.

The recruiters also attend high school and college career days to advise aspiring young engineers how to secure their future even before they have completed their schooling. In the past many hundreds have been hired by this method.

Arrangements have even been made for civil service examinations to be administered at high schools for typists who seek employment at Picatinny. Picatinny will go more than halfway to help applicants.

Engineers and scientists at locations remote from Picatinny receive travel pay for their families and themselves at the expense of the Government if they are hired.

SIX GENERALS wearing a total of 11 stars arrived by helicopter for a recent tour of facilities at the Special Weapons-Ammunition Command, Picatinny Arsenal, Dover, N.J., and a management briefing are (left to right) Brig Gen John M. Cone, Director of Maintenance, Army Materiel Command (AMC); Col R. R. Klanderman (rear), Picatinny CO and host; Maj Gen W. K. Ghormley, CG of the Weapons Command, AMC; Lt Gen Frank S. Besson, Jr., CG of the AMC; Maj Gen William J. Ely, Deputy CG of the AMC; Maj Gen Stuart S. Hoff, CG of the AMC Electronics Command; Maj Gen Alden K. Sibley, CG, AMC Mobility Command.

r. Andre C. Simonpietri
ence Attache, State Dept.

Col Leonard M. Orman (Army)
Chief Defense Research Office

Lt Col Charles J. Lyness
Air Force Representative, DRO

Harold F. Weiler (Army)
Scientific Adviser, DRO

Defense Research Office Set Up in Regional Science Office, Latin America

Integrated effort of several major Government agencies with the Department of State and Department of Defense has set the stage for establishment of a Regional Science Office, Latin America by Aug. 1.

The Director of Defense Research and Engineering has designated the Department of the Army as an executive agency to coordinate the Latin American research support program of the Department of Defense.

Represented at an important meeting in the Office of the Science Advisor, Department of State, were the National Science Foundation, Atomic Energy Commission, National Institutes of Health and the three Armed Forces. The AEC participated informally and is not involved actively.

Initially only the Army and the Air Force will participate in the new Defense Research Office to be established in Rio de Janeiro, Brazil, under the Regional Science Office. The U.S. Navy will continue to administer its Latin American research program from Washington, meanwhile continuing to study a tri-service working arrangement in Rio de Janeiro at a later date.

Similarly, only the National Science Foundation and the National Institutes of Health will open separate offices located in the same building as the Defense Research Office at this time. Each of these offices will be directly responsible to its sponsoring agency. Overall coordination, however, will be effected through the Department of State.

Overall guidance of the State Department will be provided through a science attache, Dr. A. C. Simonpietri. The State Department already has advised Embassies that the Latin-American research team will range over all Latin-American nations to consider sponsored research.

Representatives of the interested agencies traveled to Rio de Janeiro early last month to discuss operational arrangements. They said the general plan already carries approval of the agencies supporting the program of contracts and grants to Latin American scientists for basic research.

Logistical support of the Defense Research Office will be provided by the U.S. Army, Caribbean.

Members of the group that went to Brazil to make arrangements are: Col Leonard M. Orman, Special Assistant to Commanding General, Ordnance Special Weapons-Ammunition Command, Picatinny Arsenal, Dover, N.J.; Lt Col Warren G. Langley, Chief of the Foreign Research Branch, and Harold F. Weiler, Special Assistant to the Deputy and Scientific Director, U.S. Army Research Office; Dr. André C. Simonpietri, Associate Director of International Relations, National Academy of Sciences; Dr. Herbert Dalmat and Lawrence Maxcy, Office of International Research, National Institutes of Health; Luther Schoen, Budget Officer, National Science Foundation; Lt Col Vaughn K. Goodwin and Lt Col Charles J. Lyness, Office of Aerospace Research, U.S. Air Force.

Establishment of the Defense Research Office will culminate more than three years of high-level exploratory effort by the Department of Defense to "broaden its research base into the southern hemisphere and take advantage of the unique scientific opportunities known to exist there."

Acting at the request of the Chief of Research and Development, the U.S. Army Research Office advanced a suggestion through the Department of Defense to the U.S. State Department which resulted in organization of a U.S. Science Mission to Brazil, Uruguay and Argentina in 1959.

Under the guidance of the State Department, the Mission included high ranking officials of the National Science Foundation, National Academy of Science, U.S. Atomic Energy Commission, Department of Defense, and Department of the Army. Potentialities for Latin American research were emphasized in the report of the Mission, prepared and published by the U.S. Army Research Office.

Further stress on the importance of establishing improved scientific relations between the United States and Latin America was contained in an introduction to "Science in the Americas." In this report on papers presented at the Science Section of the 77th National Conference of the U.S. National Commission for UNESCO, Dr. André C. Simonpietri stated:

"The central objective of the Science Section of the Conference was to further within the United States a greater interest and understanding of the situation of science and technology in Latin America and at the same time to demonstrate to Latin Americans how sincerely and extensively this interest already finds expression in the United States. . . ."

Other speakers at that conference emphasized the mutual benefits to be derived in many major areas of science as well as strengthening of friendship and understanding, through action to develop American support of research in Latin America. More recently, it has been pointed out that President Kennedy's Alliance for Progress program objectives could be served effectively by science support in Latin America.

Expressive of the interest of the Director of Defense Research and Engineering is the U.S. Army Research Office statement of mission as the executive agency for the Defense Research Office:

- To coordinate the military research program throughout Latin America by providing contractual support to Latin American scientists to conduct unclassified basic research.
- To provide for support of symposia on scientific subjects of interest to the Army.
- To facilitate exchange of scientific information and liaison visits among Army scientists and Latin American scientists with mutual research interests.

Army Medical Service Initiates Far-Ranging 5-Year Program

U.S. Army Medical Service leaders, backed by Department of Defense endorsement of their efforts, are initiating a far-ranging 5-year Medical RDT&E Program to meet forecasted requirements for any kind of war in any environment.

Authority to proceed with the medical research, development, testing and evaluation program came recently from the Office of the Assistant Secretary of the Army (R&D) as the climax of a year of intensive high-level coordinated planning.

Involved in formulating details of the program, a general outline of which was submitted to the Army Chief of Research and Development in May 1961, were Army Staff agencies, the Army Technical Services, Government and non-Government agencies sponsoring medical research.

Supported by a relatively fixed budget, the medical research program heretofore has been planned on an annual basis. The 5-year program provides for an accelerated medical RDT&E effort to insure adequate medical support in worldwide combat operations, particularly in remote, underdeveloped areas.

Substantially increased funding will help to accelerate the program, beginning with a $7 million addendum to the FY 1962 medical RDT&E budget. Plans call for continuation of the accelerated effort through FY 1967, with interim consideration given to long-range aspects.

Primary objectives of the program are directed toward combat military medical needs made more urgent by currently increasing prospects of limited and special warfare. Since many of the program research areas are concerned with diseases or conditions on which medical knowledge is scant or nonexistent, results may yield a byproduct of widespread benefits for civilian populations, planners said.

The program, it was emphasized, has been carefully planned and coordinated with other governmental health agencies to minimize overlapping or duplication of the medical RDT&E effort.

The Armed Forces Epidemiological Board (AFEB), composed of top civilian scientists, and the Navy Scientific Advisory Panel, consisting of some 60 high-ranking leaders in science, industry and education, assisted the Army Surgeon General in developing the 5-year program. The AFEB will continue to participate actively in an advisory capacity, especially with respect to prevention of infectious epidemic diseases, Army officials said.

In recent years, the AFEB and its 12 commissions have been engaged in such varied fields of investigation as studies of penicillin, sensitization, staphylococcal food poisoning, streptococcal infections, diarrheas and dysenteries, hepatitis, tropical diseases, virus infections, and biological effects of radiation.

Valuable suggestions regarding the 5-year program were made by an Ad Hoc Medical-Biological Committee of the Army Scientific Advisory Panel. The committee was headed by Dr. Walter J. Nungester, University of Michigan Medical School, Department of Bacteriology.

Members included Dr. Harwood S. Belding, Professor of Environmental Physiology, Department of Occupational Health, University of Pittsburgh; Dr. Alfred H. Stanton, Psychiatrist-in-Chief, McLean Hospital, Division of Massachusetts General Hospital; Dr. Geoffrey Edsall, Superintendent, Institute of Laboratories, Department of Public Health, State of Massachusetts; Dr. Francis D. Moore, Surgeon-in-Chief, Peter Bent Brigham Hospital, Boston, Mass., and Professor, Harvard Medical School; Dr. Joseph F. Sadusk, Jr., Associate Clinical Professor of Medicine, School of Medicine, Stanford University.

Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen strongly supported the 5-year program in submitting it to Dr. Harold Brown, Director of Defense Research and Engineering. In a March 27, 1962 memorandum from the Office, Director of Defense Research and Engineering to the Assistant Secretary of the Army (R&D), it was stated in part:

". . . The proposed program is a valuable aid in the continuing task of program evaluation and adjustment. It reflects the recent shifts in emphasis toward a markedly improved DOD posture to cope with limited wars; furthermore, it has taken into account the guidance of Congress concering which areas of biomedical research are most appropriate for DOD sponsorship. I regard the proposed program as technically sound and well planned to cover the predicted medical support requirements of the Army. . . ."

The 5-year program provides for increased efforts in 15 RDT&E project areas, with major emphasis on preventive medicine, including:

- *Military Preventive Medicine* having the principal objective of equipping each soldier in remote combat areas with his own "built-in" protection against a wide variety of infectious diseases.
- *Combat Surgery* aimed at reducing deaths and disability from wounds, wound infections, trauma and shock.
- *Military Internal Medicine* to prevent or shorten such major causes of military non-effectiveness as diarrheas and dysenteries, hepatitis and disabling skin diseases.
- *Military Psychiatry* designed to gain knowledge of the soldier's mental processes and thus to improve his adjustment and performance under the stresses of modern combat environments.
- *Development* of new, improved, air-droppable and transportable medical and surgical field equipment and supplies.
- *Ionizing Radiation Injury* with the goal of developing a chemoprophylactic radiation protective agent for battlefield use.
- *Military Environmental Medicine* to improve the combat soldier's ability to adapt to environmental stresses of heat, cold and altitude.
- *Basic Research in the Life Sciences* to provide, for the long-range time frame, a reservoir of basic knowledge as the keystone of future applied research and development.
- *Other Important Research Areas* such as combat dentistry, military veterinary research, and operations analysis of medical support problems in the ground forces will receive increased support.

Agencies or individuals interested in contributing research ideas or proposals in support of the accelerated Army medical RDT&E 5-year program are encouraged to contact the Commanding General, U.S. Army Medical R&D Command, Main Navy Building, Washington 25, D.C.

Scientific Paper Wins Award

One of the 96 technical papers to be presented at the Army Science Conference at the U.S. Military Academy, West Point, N.Y., June 20-22, has already earned the coauthor a Certificate of Achievement.

Lt Gen Frank S. Bessom, Jr., then Chief of Transportation, approved the award to John H. Neblett for his work on a paper titled "An Operations Research Model of Motor Truck Transport Derived from Nuclear Transport Theory." Col N. A. Gage, Jr., Commanding Officer, U.S Army Transportation Research Command, made the award in behalf of General Besson.

QM Sets Dedication Of Food Radiation Research Facility

Dedication ceremonies marking completion of construction of the Quartermaster Food Radiation Research Facility, heralded as the first of its kind in the world, are scheduled June 28 at Natick, Mass.

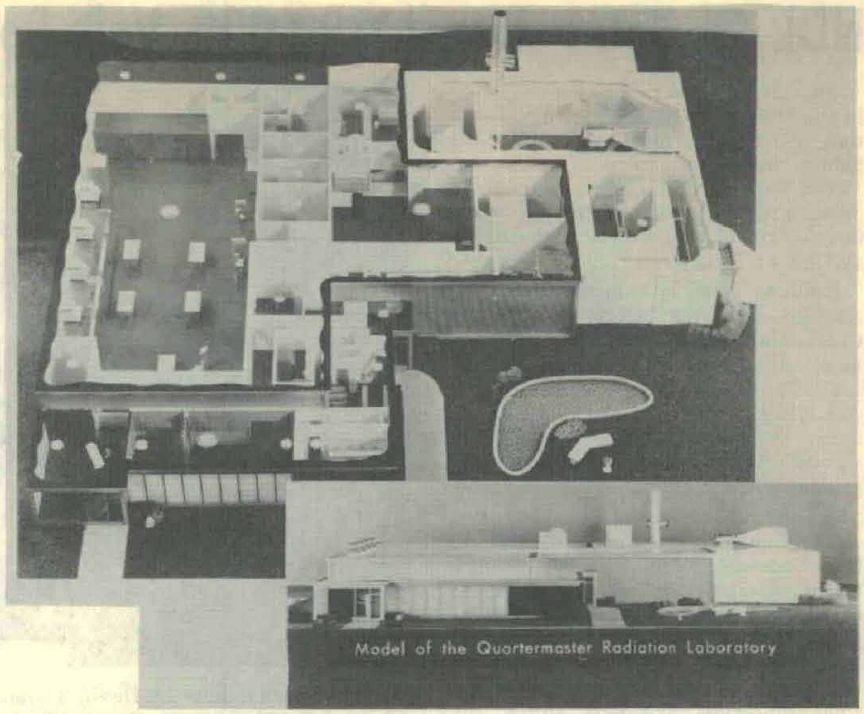
Participating with Quartermaster Research and Engineering Center officials in the festivities will be Federal Government, military and industrial leaders interested in the Army's revised 6-year (FY 61-66) irradiated food program.

Built at a cost of approximately $1.8 million, the facility is believed the first to be specifically designed for food irradiation research. Precisely controlled radiation conditions are possible to a previously unattainable degree of accuracy.

The facility includes the largest known cobalt-60 source in the world (over one million curies) and a specially designed 24-million electron volt 18-kilowatt variable linear accelerator. Control and food-sample preparation laboratories are provided.

The Army irradiated food program currently is concentrating on sterilization of beef, pork, smoked ham and chicken as meat items of major logistical importance. Research is diricted toward preserving foods for long periods without refrigeration.

By agreement with the Department of the Army, the U.S. Atomic Energy Commission was responsible for the design and construction of the facility. Acceptance tests and training of Army operating personnel will be conducted during the summer, and the Army is scheduled to accept fully operational responsibility about Sept. 1, 1962.



Model of the $1.8-million Quartermaster Radiation Laboratory, scheduled for completion early this month at Headquarters, Quartermaster Research and Engineering Command, Natick, Mass. Major components of the Laboratory include a food preparation area (entire left wing), a 1.3 megacurie cobalt-60 cell (center right), and a 24-MEV linear-accelerator cell (upper right), as seen looking into the model with roof removed.

Joint U.S. Air Force-U.S. Army Effort Seeks Data On Long-Range Radio Transmission From Australia

Australia is currently the scene of a joint U.S. Air Force-U.S. Army research effort to collect information on transmission of radio waves over very long distances. Electromagnetic propagation tests will have the further objective of discovering more about composition of the lower space region known as the ionosphere.

Experiments began late in May and will continue during June and July. Three military and five civilian scientists from the U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J., are working with three civilian electronic engineers and 20 aircrewmen from Rome Air Development Center, Griffiss Air Force Base, Rome, N.Y.

Dr. Friedrich H. Rader and Dr. Gernot M. R. Winkler are among the Signal Corps experts conducting the tests, including ground-to-ground intermittent transmissions from sites on both coasts of the United States. Stations in Panama and Hawaii also are being used.

Signals are being received by the U.S. Air Force ground station in Australia and a Rome Air Development Center KC-135 aircraft serving there as a ground station. The high-flying KC-135 also will be used for air-to-ground tests, transmitting from Australia to a receiver station of the RADC. Both standard and very low frequency communications bands are being utilized.

Data collected from the experiments will support the engineering design of new long-range military communications equipment.

QM Tests Cube Foods For Astronauts During Scott Carpenter Flight

Special bite-size space foods developed by the Army Quartermaster Corps under joint contract to the NASA Manned Spacecraft Center and the Air Force were tested by Astronaut M. Scott Carpenter on his May 24 orbital space flight from Cape Canaveral, Fla.

Confection-type in appearance, the ¾-inch cubes are based on a variety of foods—high-protein cereals, nuts, fruits, chocolate and breads.

The cubes were substituted for the squeeze-type tubes of applesauce and beef and vegetable mixture used by Lt Col John H. Glenn, Jr., in his Feb. 20 orbital flight.

Tests of both these prototype foods, solid and squeeze-type, under actual space flight conditions will provide realistic data for development of an efficient feeding system for astronauts. Development of these special foods is spearheaded by the Quartermaster Food and Container Institute for the Armed Forces, Chicago, through specifications furnished by NASA and the Air Force.

NDL Operates Army's 700,000 Volt Positive Ion Accelerator

The largest positive ion accelerator in the United States, equipped to function at 700,000 volts and capable of firing hydrogen isotope deuterons 17,000,000 miles an hour, is now in operation at the U.S. Army Chemical Corps' Nuclear Defense Laboratory (NDL) at Edgewood, Md.

Built to NDL specifications by the Applied Radiation Corp. of Walnut Creek, Calif., at a cost of $95,000, the accelerator produces neutrons used in radiation tests. It increases Army capability to ascertain radiation effects, and is expected to contribute significantly to technical research programs of the Department of Defense.

Protection of people, crops, and other biological and inanimate objects from nuclear effects is one of the major objectives of NDL experiments in which the accelerator will be employed. Investigations deal with problems typical of the nuclear age: What happens when neutrons strike, and what materials are best suited for shielding?

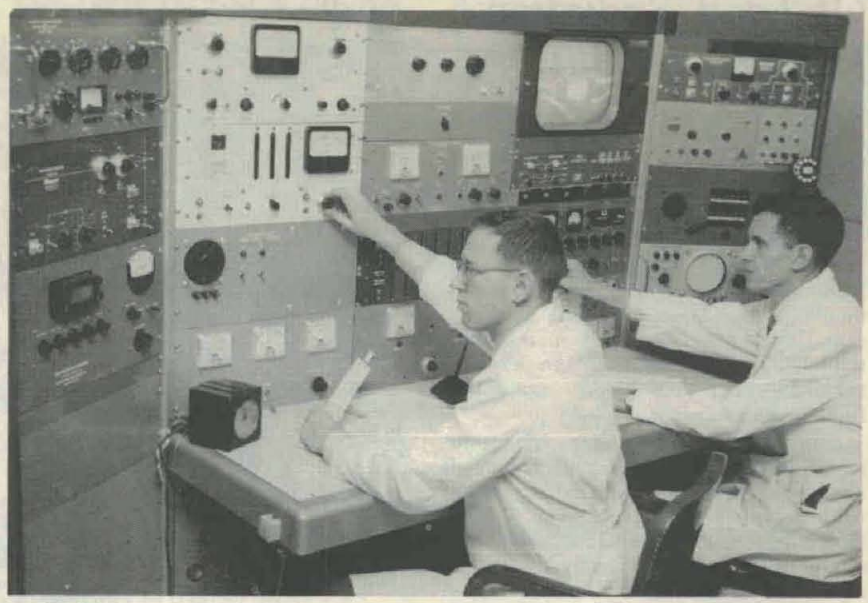
Shielding, in NDL tests, means protection. Experiments seek to determine what materials will intercept neutrons, and to what extent. Obviously, some substances stop neutrons to a greater degree than others.

Movements of neutrons, as explained by John W. Kinch, Chief of the Radiation Measurement Branch, can be compared to movements of billiard balls. The traveling neutron, like a driven cueball, strikes others and puts them in motion—a chain reaction that continues even though the cueball or original neutron-in-motion has been stopped by the impact of the first collision.

Explaining the actions, reactions, and energies of neutrons in detail may create the impression that a neutron can be seen. This is impossible, even with a high powered microscope, because a neutron is too small—about one trillionth of a centimeter.

The NDL positive ion accelerator, of "cascade rectifier" design, functions under constant inspection of its operators. Technicians at the control console observe operations from an adjoining room by means of closed circuit television. Movable cameras can be directed to any portion of the PIA's assembly and focused for clear readings of meters, diagnostic equipment, and instruments.

Reactions to different materials are assayed and recorded or scored in what are known as "barn" books. With these, probable reactions of neutrons can be predetermined.



Electronic technicians Lt David Thomas and John C. Goshorn, Jr., direct operations of positive ion accelerator from separate control console. Accelerator's reaction is observed through closed circuit television.

John W. Kinch (right), Chief of NDL Radiation Measurement Branch, and David L, Rigotti, Head of Laboratory Nuclear Testing Division, adjust positive ion accelerator's control rods prior to testing operations.

The accelerator's ion source unit includes a replaceable deuterium container or tank of deuterium gas. Deutrons are fed into an 8-foot vacum tube and accelerated by a 700,000-volt charge. Additional bursts of current increase their speed before they strike tritium atoms (hydrogen isotopes of atomic mass 3) at the opposite end of the tube. The terrific impact emits neutrons.

The PIA's focus and deflector system reduces the ion beam to the desired size, and an automatic analyzer records data on the ion beam. With a control console serving for remote operations, production of neutrons reaches well into the billions.

Radioactivity exists while the PIA is in operation, a situation necessitating the separated control console and its television screens. No one is permitted in the accelerator room while the machine is in operation. Radioactivity dangers cease when the PIA is not operating.

The machine's interlock or safety system serves as an overall precautionary measure, protecting personnel and equipment from harm or damage through possible malfunction or error. Although secondary reactions are possible when an ion beam and air molecules collide, the PIA's vacuum system prevents such reactions.

Nuclear Defense Laboratory studies include sampling and analyzing atomic and thermonuclear fallout, attenuation of thermal radiation, evaluation of chemical dosimetry, shielding against gamma and neutron radiation, CBR shelter evaluation, neutron flux and gamma measurements, thermal indicators, and neutron-induced activities.

Comprised of five divisions having 16 branches, the laboratory is commanded by Lt Col Heber C. Brill.

RAC Develops Camera Technique to Zero In on M60 Tank Targets

Three platoons of M60 tanks engaged recently in attack, defense and gunnery practice exercises at the Friedberg Training Area in West Germany—without firing a shot of ammunition. But shortly after the conclusion of the exercises the performance of tanks and crews of the 1st Medium Tank Battalion, 32nd Armor, 3rd Armored Division could be evaluated.

This ingenious experiment in field training and performance evaluation was based on imaginative use of a familiar item—the 16 mm. camera—by the Combat Developments Division of Research Analysis Corporation. A surplus Air Force 16 mm. pulse-operated camera was strapped to the bore evacuator of the M-68 gun on each attacking M60 tank, and the camera was activated by a switch controlled by the tank commander.

Prior to each exercise, both the camera and the gun were zeroed on a clearly visible panel target 1,200 meters away. A "zero picture" (showing the photographic position of the target when the gun was accurately laid) was then taken. This picture was later used as a reference for analyzing photographs made at the time of gun firing. Another "zero picture" was taken at the completion of each exercise, to assure that the camera had not jarred out of position during the repetitive firing.

The tank commander pressed the camera switch as soon as he saw the target, and the camera began to record gun movements at the rate of one picture per second. When the gunner fired at the target, a special film marking was placed on the edge of the picture taken at that second.

With this photographic record and the help of a trained observer who rode on the "bustle" of the tank, it was possible to answer the following questions about the performance of each tank and crew:

- How many seconds were required for a tank commander to "acquire" (see) a target? In other words, what was the elapsed time from the moment a target could be seen until it actually was seen by the commander? This "acquisition time" interval was measured by a stop watch operated by the observer, who knew ahead of time where the targets would be.
- How many seconds elapsed between target acquisition by the commander and actual firing by the gunner? This "fire time" was measured by counting the number of pictures taken by the gun camera between acquisition and firing. If 15 pictures were taken from the time the tank commander pressed the camera control switch until the special film marking showed on a picture, the "fire time" was 15 seconds.
- How accurate was the gunner's lay on the target? A special transparent plastic grid was developed by Research Analysis Corporation. This grid, referenced to the "zero picture" taken earlier by the gun camera, was placed over the photograph taken by the same camera at time of firing to determine whether the lay of the gun was on target.

Camera (16 mm.), mounted on M-68 gun, acquires target in Friedberg training maneuvers. Shown aboard the M60 tank are the tank commander, the Army timer who stop-watched acquisition performance, and RAC observer.

Two attacking M60 tank platoons were equipped with gun cameras; the third operated as a defending force. In the first experiment, each attacking platoon operated in two different carefully planned combat scenarios. The concealed defending tanks fired smoke simulators; during the attack some moved, some were stationary.

In the second experiment, individual tanks fired against known target systems of the Table VIIIA type, the standard daytime crew proficiency exercise in which the main tank gun fires at fixed and moving panel targets. Individual tanks then fired against an unknown target display to develop comparative environmental reaction-time data.

Approximately a week later, similar exercises were conducted to determine the degree of improvement in successive training experiences. Lt Col William F. Mangum, commanding officer of the 1st Medium Tank Battalion, commented:

"The potential value of a system of this nature as a training device was immediately apparent. The psychological effect on all crew members was obvious. Accuracy of lay, speed of reaction, and target hit possibility were no longer matters of speculation. The films left no doubt."

One of the important benefits of the technique will be the maintenance of a high residual battle life of the M60 tank. This is accomplished by obtaining maximum personnel proficiency improvement per training mile. The system also will alleviate the problem of diminishing availability of training areas in Germany.

Research Analysis Corporation leaders said the technique will be refined and developed in future experiments incorporating use of second-generation camera equipment.

Danish Army Leader Visits Army Installations in U.S.

Tours of major military installations highlighted a recent visit to the U.S. by Maj Gen E. H. Wolff, Chief of the Danish Army Staff.

Following two days of briefings by the Army Staff in Washington, D.C., General Wolff visited Headquarters, USCONARC, Fort Monroe, Va.; the Army Ordnance Missile Command, Redstone Arsenal, Huntsville, Ala., and the Army Aviation Center, Fort Rucker, Ala.

On the West Coast, he toured the Army Combat Development Experimentation Center and Army Infantry Training Center at Ford Ord, Calif., and the Army Language School at Monterey.

General Wolff completed his visit with stops at the North American Air Defense Command, Colorado Springs, Colo.; Army Air Defense Center, Fort Bliss, Tex., and Army Signal School, Fort Monmouth, N.J.

Texas Display Informs Industry of Army Needs For Gas Turbine Engines When Cost Is Reduced

Industry was given a broad insight into Army requirements for gas turbine engines when the Army Transportation Materiel Command in St. Louis, Mo., arranged an exhibit at the Seventh Annual Gas Turbine Conference and Products Show in Houston, Tex.

The show was sponsored by the Gas Turbine Power Division of the American Society of Mechanical Engineers. TMC representatives participated to explain to industrial leaders the immediate needs and the long-range potential of Army requirements for gas turbine power.

Two Army helicopters, the HU-1 Iroquois and HC-1B Chinook, both of which have distinguished themselves by performance during recent operations in the polar regions, have gas turbine engines. Presently the AO-1 Mohawk is the only Army fixed wing aircraft using this type of power. The "Overland Train," which recently completed exhaustive testing, is the only Army surface vehicle using a gas turbine engine.

The Army Transportation Corps seeks more extensive use of gas turbine engines in aircraft and surface vehicles because of their low maintenance cost. High production costs, largely attributable to low volume of demand, are a retarding factor in extensive use of gas turbine engines.

Besides a lower maintenance cost, gas turbines are light, compact and able to start in extreme cold, all of which are important military factors. With several companies working on military needs, and other companies developing commercial and industrial uses, increased production is expected to decrease cost.

The TMC showed the gas turbine industry at the Houston conference that the Army is a potential market. Over 1,000 industry representatives toured the TMC exhibit, saw the Army's requirements, and told TMC the problems industry faced.

No orders were placed; no contract plans were made. It may be several years before the ideas envisioned at Houston can become realities.

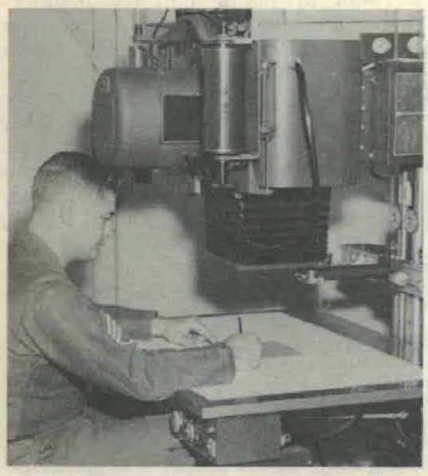
Device Transfers Data From Radar Photograph For Mapping Purposes

A radar sketching device that provides a capability for transferring mapping data from side-looking radar photography to a controlled manuscript or plotting sheet is being tested by the U.S. Army Engineers.

The instrument introduces up to 10 percent scale differential between the longitudinal and transverse axis of the radar film transparencies. This capability provides a means of compensating for large-scale distortions introduced along the longitudinal axis by incorrect ground speed input at the time of radar observations.

The sketching device is designed as an assembly used in conjunction with the standard autofocus reflecting projector. The system accommodates radar film transparencies of any size up to 9½" x 9½", or equal widths of roll film in lengths up to 250 feet. Automatic focus is possible for a magnification range of .33X to 3.0X.

The device was built by Aero Service Corp., Philadelphia, Pa., under a contract with the U.S. Army Engineer Geodesy, Intelligence and Mapping Research and Development Agency.



SFC Huey P. Bolton operates radar sketching device which transfers mapping data from side-looking radar photography to plotting sheet.

Executives Complete Course For Effective Listening

Certificates for completing an effective listening course for executives were awarded to 18 men at recent ceremonies at the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir. Dr. George W. Howard, Technical Director of the Laboratories, made the presentations.

The course was conducted by Dr. L. Poe Leggette of George Washington University, and was sponsored by the Training and Development Division of the Fort Belvoir Civilian Personnel Office.

Engineer Labs Develop Organic Paint Stripper, Solar Reflecting Paint

A fast acting, highly efficient organic stripper for the removal of paint or enamel has been developed by the U.S. Army Corps of Engineers. Considered superior to any commercial product, it can remove paint or enamel from any surface within four or five minutes and leaves no residue.

The stripper softens and penetrates the paint or enamel film and releases a gas which lifts the film from the surface. It contains detergent emulsifiers so that the partially dissolved paint film then can be flushed off with water, is non-flammable, and can be applied to any surface by either brushing or spraying.

The Materials Branch of the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va., also developed recently a paint that gives greater reflectance of solar energy. Camouflage paint, which reflects a high percentage of incident solar radiation, has been obtained through use of newly developed special green pigments. The new paint allows camouflage painting of Army missiles and prevents excessive heat absorption by missiles exposed to maximum solar radiation.

Formerly such missiles had to be painted white to prevent excessive absorption of solar energy and subsequent overheating of instruments.

Sp/4 E. O. Harrington checks reaction of organic stripper in removing paint or plastic from test panel.

Suggestion on How to Find Way When Lost Earns $500 Award

Scientific refinement of a time-honored Boy Scout method of how to determine direction when lost in the woods without a compass has won a $500 Civilian Incentive Awards Program Award—all because of a mother's pride.

What may be more important to many an Army man lost in rough terrain in the future, Robert Owendorff's findings in a concentrated 6-month study are being incorporated in Army survival literature. All a soldier needs is a fairly straight stick and ability to draw a straight line to replace a nonexistent compass.

Interest in 17-year-old Robert's detailed description of his method is not confined to the Army. The American Red Cross and other organizations have requested permission to include the description in survival and emergency manuals. That may seem strange to anyone who has been trained as a Boy Scout to use substantially the same method, though not as precisely.

Still, were it not for the pride of Mrs. Vada Owendorff in her son's achievement, results of Robert's research might have gone unheralded. Employed in the Office of the Director of Military Operations, U.S. Army Chemical Corps, Mrs. Owendorff decided to use the Civilian Incentive Awards Program suggestion box as a means of telling the Army about Robert's method.

When no less than Maj Gen Marshall Stubb's Chief Chemical Officer, presented her with the $500 award—one of the larger awards made by the Chemical Corps in the Incentive Awards Program in recent years—Mrs. Owendorff was most agreeably surprised. Also, prouder than ever of Robert!

A senior in George Mason High School in Falls Church, Robert was 13 when he learned the method. He was 16 when he began his research in area libraries to learn if anyone had formally presented a proposal on the stick direction finding technique. He spent nearly 400 hours in research to satisfy himself that no one had. He then devoted another six months to deriving mathematical formulas.

In comparing his method with similar systems already in use, Owendorff found that the problem of proving why it was as true or truer than a compass about 70 percent of the time required outside help. Fellow students and mathematics professors at George Mason High School were asked to help him explain *Why*.

Maj Gen Marshall Stubb presents commendation along with $500 to Mrs. Owendorff as son observes.

Finally, he was presented with solutions by mathematics professors at Harvard University, the University of Virginia, and Leicaster University in England. Next Robert Follett, a programing engineer with International Business Machines Corp. was pressed into service.

After 10 million computations, the desired information came out of the whirring wheels of a 7090 computer, in the form of more than 600 pages of data. Now let Robert Owendorff describe the "shadow tip" method for finding direction in the Northern Hemisphere.

"To determine direction accurately, find an opening in the trees where the sun shines brightly on some flat, brush-free ground. Drive a stick about four feet long into the earth, keeping it as vertical as possible. Immediately you note the tip end of the shadow cast by the stick and mark it with a small peg or a hole in the ground. On a cloudy day, top the end of the stick with your finger; the slight movement of the shadow will help you find it.

"Then you wait a short time for the shadow to move a few inches: 15 minutes is enough for a good reading—Carefully draw a straight line in the dirt to connect the two marks, and extend it in both directions. This line . . . runs east and west . . . from the base of the stick. . . . Intersect it at right angles. . . . It points north . . . the opposite direction, south.

"With the shadow tip method you have time to take a number of readings as you move along during the day. . . . The average error will be only about 5 degrees, and if you take readings in the morning and in the afternoon, this error will cancel itself.

"A bonus feature of the shadow-tip method of direction finding is that with it you can also learn the time of the day to an accuracy of about 25 minutes. To do this, draw a line that goes through the base of the stick and runs parallel to the east-west line. The west half of the line indicates 6 a.m., and the east half is 6 p.m. The north line is noon. By dividing the distance between each of these points into six sections you can approximate the hours of the day as they would appear on half of a 24-hour clock. For example, when the shadow of the stick is halfway between west and north, it is about 9 a.m."

Provocative Ponderables

"If our nation is to move forward in this revolutionary age, nothing less than a basic change in individual and public attitudes respecting intellectual achievement is required. . . . Our youth must learn that intellectual superiority is neither an accident of birth nor a crown easily won. It is achieved through unremitting determination and hard work."—John M. Stalnaker, president of the National Merit Scholarship Corporation.

* * *

"Women are just as smart as men. . . . Progress needs brains in all areas of youthful endeavor—and we cannot progress as fast as we might if we lose the benefit of the vast reservoir of feminine brains in this country. . . . The Soviet Union has 400,000 women scientists and engineers; the U.S., 12,000." —Dr. Raymond Ewell, University of Buffalo, to a symposium on job horizons for women.

* * *

"Although industry must make money in order to survive in a free country, and although industry must survive in order to keep the country free, industry must not drive the Government into economic weakness by inefficient and unnecessary cost or profit practices. The national interest includes the interests of industry, but not those alone." —Secretary of the Army Elvis J. Stahr, jr.

* * *

"We have been slow to recognize that we are the first generation that holds the veto power over continuation of humanity." —Dr. Brock Chisholm, former Director General of the World Health Organization.

HumRRO Schedules Jan. 1 Move From GWU to New Building

Additional space requirements explain a decision to move the Human Resources Research Office of George Washington University from the campus in Washington, D.C., to Alexandria, Va., about Jan. 1.

HumRRO's new home will consist of 28,000 square feet of office space in the Fidelity Building, under construction at the corner of North Washington and Queen Streets. University President Thomas H. Carroll and Lt Gen Arthur G. Trudeau, Chief of Research and Development, Department of the Army, joined in announcing relocation plans.

Currently in its 11th year of operation, the Army contract with the George Washington University for HumRRO activities will remain basically unchanged it was stated.

Dr. Meredith P. Crawford, Director of HumRRO since its establishment in July 1951, will move with his staff to the Fidelity Building. Dr. Benjamin D. Van Evera, Dean for Sponsored Research, will remain on the campus as the University administrator for HumRRO.

Overall monitorship of the HumRRO program, currently involving nearly 30 major research tasks conducted through five HumRRO field units, in conjunction with the U.S. Continental Army Command, will continue to be a responsibility of the Human Factors Research Division, U.S. Army Research Office.

Approximately 110 George Washington University employees of HumRRO will be retained and transferred to the Fidelity Building. These represent the HumRRO central office and one research group, the Training Methods Division. Field units, employing 170 personnel, are located at Fort Benning, Ga., Fort Rucker, Ala., Fort Knox, Ky., Fort Bliss, Tex., and the Presidio of Monterey, Calif.

Half of all HumRRO personnel are classified as professional; 65 hold the doctor of philosophy degree and 30 more have the master's degree.

Commenting on the relocation of HumRRO, Dr. Carroll expressed regret "that lack of additional space on the campus makes it necessary for HumRRO, a distinguished part of the University family, to occupy quarters elsewhere."

Space presently occuped by HumRRO in the 4-story University Building at 2013 G Street, N.W., will be used as classrooms and academic offices when the move is completed.

General Trudeau remarked that HumRRO research results over the past 10 years have been used by the Army in the fields of training, motivation, leadership, and man-weapons system analysis.

"From the Army's point of view," he said, "we are confident that the change in location will not alter the close relationship we have had for the past decade with the George Washington University in this research effort, but will, by providing additional working space, make it possible for HumRRO scientists to continue to be responsive to the Army's evolving human resources research needs.

"I wish to emphasize that, in addition to being capable scientists, these HumRRO men are down-to-earth people who assist materially in solving the Army's practical problems. They work directly with military personnel on an Army-wide basis—wherever the problems are. At the principal training centers of the combat arms, where Human Research Units are based, these professionals maintain daily contact with Army personnel.

"Each HRU is composed of both military and civilian members, working side by side. They have first-hand knowledge of tanks, missiles, the Infantry, and the problems of field soldiers and military technicians.

"The Training Methods Division, with its base of operations in the Washington area, works with the various technical services at their training locations. HumRRO research teams travel throughout the world to gather information from United States Army organizations.

"This is a unique operation, and HumRRO has made itself especially useful through the development of more efficient training programs which have resulted in enormous savings in time and money without reducing the proficiency of the individual soldier. In some instances, trining time has been cut down as much as 25 to 50 percent."

New HumRRO Headquarters in Fidelity Building, Alexandria, Va.

DOD Board Reviewing Army Aviation Requirements

A thorough re-examination of Army aviation requirements, to be completed with recommendations to Secretary of Defense Robert S. McNamara by Sept. 1, is being made by a board headed by Lt Gen Hamilton H. Howze.

Appointment of the Commanding General, Strategic Army Corps and XVIII Airborne Corps (STRAC) to head the review board was announced May 8.

The board will conduct an extensive program of analyses, exercises and field tests to evaluate new concepts of battlefield mobility in terms of cost-effectiveness and transport-effectiveness factors.

The study will determine the extent to which air vehicles, operating in the environment of the ground soldier, can be substituted for conventional military surface systems, both tactically and logistically.

Consideration will be given to new organizational and operational concepts, possibly including completely air mobile infantry, artillery, anti-tank and reconnaissance units.

Army Picks Aberdeen for Limited War Laboratory

U.S. Army Limited War Laboratory activities will be centered at Aberdeen Proving Ground, Md., and will get underway this month, it was announced by the Department of the Army.

As stated in an article in the April 1962 issue of this publication, the new USALWL will aim to meet requirements for rapid development of the specialized weapons and other materiel for guerrilla, counter-guerrilla and counter-insurgency operations.

Col Sterling C. Holmes, an Ordnance officer with experience as a combat infantry officer, was reassigned in May from the Army Ordnance Missile Command, Redstone, Ala., to serve as the Laboratory Commanding Officer.

Recruitment of an operating staff of approximately 70 is being expedited. Professional personnel will include chemists, physicists, electronic specialists, natural scientists, analysts and engineers. They will work closely with key agencies of the Army Combat Development System.

Specialized chemical, electronics and biological facilities, experimental fabrication shops, and a library devoted to limited war publications will be provided for the USALWL. The Laboratory also will utilize the wide variety of R&D resources available at the Aberdeen Proving Ground and other Army agencies.

Prospects Brighten for Pay Raise Compromise

Prospects appeared to be improving late in May that a compromise will be reached on what President Kennedy has proposed in the way of pay raises for upper-level scientific and administrative personnel, and what Congress believes is proper.

President Kennedy's proposals call for a graduated pay raise spread over a 3-year period. Beginning salaries effective Jan. 1, 1963, would be GS-11, $7,960; GS-12, $9,380; GS-13, $10,965; GS-14, $12,665; GS-15, $14,495; GS-16, $16,400; GS-17, $18,350; GS-18, $20,315; GS-19, $22,245; GS-20, $23,000.

Effective Jan. 1, 1964, the pay schedule in the beginning step of each grade would be: GS-11, $8,325; GS-12, $9,910; GS-13, $11,670; GS-14, $13,615; GS-15, $15,725; GS-16, $17,970; GS-17, $20,325; GS-18, $22,740; GS-19, $25,150; GS-20, $26,000.

Beginning Jan. 1965, the initial step pay in each grade would be: GS-11, $8,580; GS-12, $10,270; GS-13, $12,190; GS-14, $14,310; GS-15, $16,620; GS-16, $19,125; GS-17, $21-755; GS-18, $24,500; GS-19, $27,290; GS-20, $28,000.

Compromise proponents have various proposals but Congressional leaders appeared to consider a pay raise spread over a 2-year period most likely to receive approval, with the first increment on July 1, 1963, and the second on July 1, 1964.

Likewise, the amount of the pay raise was still open to controversy. Some leaders were of the opinion that the graduated total pay raise as approved (and if approved!) by Congress will range from 5 to 6 percent for those in the lower grades to 10 or 12 percent for employees in the middle and upper grades.

Labor Bureau Gives Scientist, Engineer Statistics

About six percent more scientists and engineers were employed by American industry in January 1961 than in January 1960, a rate of increase paralleled for 1959-1960.

The statistics are taken from preliminary findings of a survey conducted by the Bureau of Labor Statistics, U.S. Department of Labor, in cooperation with the National Science Foundation. In January 1961, about 658,000 engineers and 192,0000 scientists represented a total increase of about 50,000 over January 1960.

While the engineers outnumbered scientists about 4 to 1, nearly half of the scientists were employed as chemists. Not covered by the survey were self-employed scientists and engineers, those employed by Federal Government, educational institutions, nonprofit organizations, and employees of small establishments.

About 35 percent of the engineers and scientists were engaged in research and development (including the administration of research and development programs). This is about the same as in previous surveys.

The electrical equipment industry and the aerospace and ordnance industry group each employed more than 120,000 scientists and engineers in January 1961. Together, they accounted for about 40 percent of the scientists and engineers employed in manufacturing industries and nearly 30 percent of all scientists and engineers in American industry.

By Dr. Ralph G. H. Siu
Technical Director, R&E, OQMG

BAITED BULLS. What happens to some individuals during their tour of duty in the Pentagon?

Many individuals assigned to the Pentagon undergo a peculiar transformation, which is characterized by four stages. The first stage is the *Neophite.* The Neophite feels highly complimented that he has been selected by name for assignment to such a high staff. All matters are treated with consummate energy. In-baskets are kept clear; directives written with dispatch; meetings attended eagerly.

About six months later a transition to the next phase begins. In-basket fills as rapidly but empties less readily; coordination time drags out; meetings drone on. Imperceptibly, he learns of the trade secret of just noting and initialling all papers coming across his desk. Gradually, he becomes a *Polyp.* In-baskets are kept clear again; directives are written by the Neophite who has just reported in; meetings are attended by his Neophite alternate. This is the comfortable stage of Pentagon life.

Things go well for a while until a sudden change into the next stage, which invariably occurs at a conference. The conference takes place in a large room with a center table around which are seated the more senior conferees. Against the wall are arrayed a score of Neophites and Polyps. The subject is highly familiar to one of the Polyps and the discussion proceeds to the point where he cannot contain himself any longer and he bursts forth:

"This is entirely the wrong approach, because. . . ." At that moment he has become a *Baited Bull* and receives all subsequent papers on that subject since he is the recognized expert. Matters get serious once more; work piles up; the in-basket fills again; directives are written with frenzy; meetings are chaired by him.

He then remains as a Baited Bull for some time until there is a gradual drift into the last and final stage, *The Elder Statesman.* In this stage all matters are treated with a casual but unhesitating assurance which comes from years of experience. He floats about the office with an air of professionalism, advising the Neophites, ignoring the Polyps, and baiting the Baited Bulls.

CmlC Researchers Believe Inhalant-Type Vaccine Will Safely Immunize Humans Against Tularemia

Army scientists anticipate that their inhalant-type live vaccine will be safe and effective for the immunization of man against tularemia (rabbit fever). The basis for this confidence was reported in May at the 62nd Annual Meeting of the American Society for Microbiology at Kansas City, Mo.

Dr. Henry T. Eigelsbach presented the discoveries of a research team comprised of medical bacteriologists and pathologists from the U.S. Army Chemical Corps Biological Laboratories at Fort Detrick, Md.

With Jerry J. Tulis, Dr. J. D. White, and Capt Malcolm H. McGavran, he conducted extensive studies on monkeys to acquire data on the clinical acceptability of the live vaccine administered by inhalation.

Previous research in collaboration with Dr. C. M. Downs of the University of Kansas led to the initial demonstration in this country that live tularemia vaccine administered to man by the skin route was harmless and afforded good protection.

In recent studies, detailed bacteriological, serological and pathological examinations were made on monkeys that had inhaled a large dose of live vaccine organisms (about 100,000). Results were compared with those obtained on animals administered the vaccine by multiple puncture of the skin in the same manner as vaccination against smallpox.

The studies revealed that no adverse clinical reaction occurred, tissue changes were mild, and the immune response was consistently better in animals given aerosolized vaccine.

Dr. Eigelsbach explained, "Monkeys vaccinated aerogenically (by inhalation) or dermally (skin route) did not show any signs of illness; multiplication of vaccine organisms (previously found necessary for a good and lasting immunity) did occur within the animals; as immunity developed, live vaccine organisms were destroyed, leaving the animals resistant to tularemia."

Proof of the benign nature of the tularemia aerogenic vaccination procedure in the monkey, an animal species less capable of dealing with tularemia than is man, provided the basic information considered an essential preliminary to any evaluation in man.

The principal advantage of aerogenic vaccination lies in its potential for effective mass immunization against respiratory disease, Dr. Eigelsbach pointed out. It is conceivable, he said, that recent advances in the packaging of aerosol products and the development of aerogenic vaccines might someday eliminate the need for a series of painful "shots" in individuals who desire vaccination.

Assigned to Weapons Group

Maj Andrew B. Witko has been assigned to the Nuclear Weapons Coordination Group (NWCG), U.S. Army Engineer Proving Ground, Fort Belvoir, Va. A native of Indiana, he was commissioned in 1948 at the U.S. Military Academy, West Point, N.Y. He obtained a master's degree in engineering (nuclear) at the University of Michigan in 1958.

U.S. Army Mobile Radiation Counting Laboratory Serves Many Agencies

The U.S. Army mobile radiation counting laboratory has proved accurate, economical, and a big time-saver for Government, industry and institutions. Believed the only one of its type in the world, it was designed by the Nuclear Defense Laboratory at the Army Chemical Center, Md.

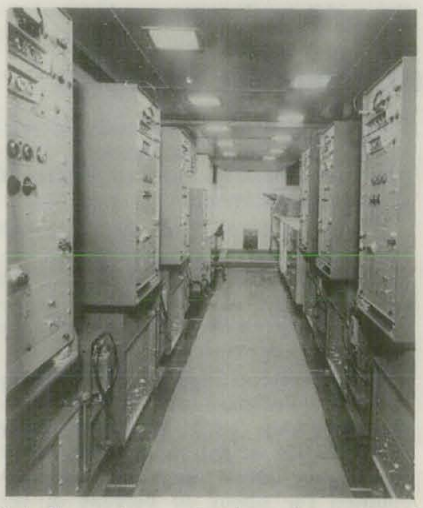
Used to measure the induced radioactivity in certain materials, the unit permits determination of the neutron flux to which the materials were exposed and provides an indication of the neutron spectrum.

Six counting devices, run by an electronic brain, measure the radioactivity of small discs of elements placed near a reactor. Induced radioactivity is directly proportional to the number of neutron hits received by the elements. Information is automatically recorded on punched cards and, when reduced, enables scientists to determine the number of neutrons within various energy ranges at any point near the reactor.

NDL scientists said the measuring system was most valuable in measuring neutron flux of reactors such as the Diamond Ordnance Radiation Facility (DORF), recently "mapped" at the Forest Glen Annex of Walter Reed General Hospital. The facility produces an extremely short radiation pulse and is used to simulate, at lower levels, the initial radiation from a nuclear detonation.

The reactor at Walter Reed, the first acquired by the Army for studies of radiation effects on military items, was the sixth reactor for which the portable laboratory provided neutron flux and spectrum measurements.

Using a threshold detection system, originally developed by G. S. Hurst of the Oak Ridge National Laboratories but expanded and improved by NDL, the laboratory measured relationships between numbers of neutrons emitted during a pulse and distances from the reactor.



Interior view of Army's trailer-mounted radiation counting laboratory, showing the six counters which are controlled by an electronic brain.

Findings are vital to evaluation of radiation effects upon militarily significant items exposed at DORF. They enable researchers to relate changes or damages to components to the amount of radiation received.

It took only two weeks for two men to measure and "map" DORF. If the trailer were not automated, at least six months would have been required from the start of measuring through the reduction of data.

The self-contained trailer laboratory has traveled by Military Air Transport Service and Military Sea Transportation Service and was pulled by a truck without sustaining so much as a loose tube. Scientists at NDL credited the safe transport of the delicate equipment to the design and fabrication work of NDL nuclear testing and mechanical personnel.

Since it was built, the unit has been used in work for the Federal Government, for universities and for industries. More pulse type reactors are being built or contracted for, and the scientists in charge of the trailer see more work ahead in their field.

Army Awards Contracts Totaling More Than $210 Million

Contracts for research, development and procurement of military materiel and services aggregating more than $210 million were announced recently by Department of the Army.

The largest contract, $41,349,052, was awarded to Bowen-McLaughlin-York, Inc., York, Pa., for production of 498 M88 tank recovery vehicles.

Totaling $31,671,507, two contracts awarded to Willys Motors, Inc., Toledo, Ohio, call for production of 10,130 ¼-ton utility trucks (M151). The M151 replaces the M38 series, commonly known as the "jeep," as the Army's tactical, administrative and reconnaissance vehicle.

Two contracts totaling $25,659,872 let to FMC Corp., San Jose, Calif., are for production of 75 missile carriers for the Pershing missile and 1132 M-113 armored personnel carriers for the Federal Republic of Germany. Funds for the latter are being provided by the recipient country.

Olin Mathieson Chemical Co., New Haven, Conn , received a $10,694,269 contract for 90,000 M-14 rifles.

A $10,000,000 letter contract to Minneapolis Honeywell Regulator Co., Hopkins, Minn., is for ammunition. Other contracts for ammunition include: Weatherhead Co., Cleveland, Ohio, $7,670,250; Aerojet General Corp., Downey, Calif., two contracts totaling $7,334,546; Olin Mathieson Chemical Corp., East Alton, Ill., two contracts totaling $6,681,372.

General Dynamics, Pomona, Calif., received two contracts totaling $9,765,290 for continuation of research and development on the Redeye and Mauler missile systems. Thiokol Chemical Corp., Bristol, Pa., was awarded a $6,907,806 contract for igniters for missile motors. Bendix Corp., Baltimore, Md., received a $6,000,000 classified contract.

Three contracts totaling $5,945,300 were let to Allison Division, General Motors Corp., Indianapolis, Ind., for 131 transmission assemblies for the M-60 tank, 125 transmissions for M88 tank recovery vehicles and spare parts for tank recovery vehicles.

A $4,036,744 contract let to Admiral Corp., Chicago, Ill., is for 9,744 lightweight, portable radios.

Goodyear Tire & Rubber Co., Akron, Ohio, was awarded two contracts aggregating $3,625,524 for equipment for the M-55 howitzer and M-47 tank and truck tires. Kleinschmidt, Inc., Division of Smith-Corona-Marchant, Inc., Deerfield, Ill., received a $3,127,678 contract for 819 teletypewriters.

A $3,108,000 contract was awarded to Bay City Shovels, Inc., Bay City, Mich., for 84 truck-mounted cranes. For production of the M-72 rocket launcher, Flightex Fabrics, Inc., Everett, Mass., will receive $3,095,180.

Chrysler Corp., Centerline, Mich., received a $2,599,702 contract for engineering services for the M-60 tank. A $2,509,439 contract went to Atlantis Electronics Corp., Garland, Tex., for 3083 1½-ton cargo trailers. General Motors Corp., Cleveland, Ohio, received a $2,579,024 contract for vehicle engineering services.

Firestone Tire and Rubber Co., New Bedford, Mass., was awarded a $2,454,702 contract for 155 mm. projectiles. A $2,228,000 contract let to Cadillac Gage Co., Warren, Mich., is for 800 modification kits for the M-48 tank conversion program.

A $2,004,158 contract went to Jeta, Inc., Yonkers, N.Y., for 4,057 cargo trailers. Stanford Research Institute, Menlo Park, Calif., received a $1,185,304 contract for a classified research project and a $1,493,247 contract for work on the wake radar system which studies low frequency radar phenomena during the flight of missiles.

Production of training devices for the Sergeant missile system is the basis of a $1,513,291 contract awarded to Aircraft Armaments Inc., Cockeysville, Md. Eclipse-Pioneer Division, Bendix Corp., Teterboro, N.J., received a $1,467,851 contract for repair parts for the Pershing missile guidance and control components. A $1,426,250 contract let to Sperry-Phoenix Co., Phoenix, Ariz., is for equipment to be used for testing helicopter automatic stabilization units.

Additional contracts included: Vulcan Trailer Manufacturing Co., Inc., $1,380,069 for 298 25-ton semitrailers; Philco Corp., Fort Washington, Pa., $1,314,777 for a tropospheric scatter communication system; Chrysler Corp., Airtemp Division, Dayton, Ohio, $1,215,844 for 835 modification kits for the M-48 A3 tank; Raytheon Co., Lexington, Mass., $1,150,000 for repair parts for the Hawk missile system; General Electric Co., Syracuse, N.Y., $1,150,000 for repair parts on HIPAR guidance radar for the improved Nike Hercules.

OTAC Developing Self-Propelled Howitzer, XM-104

Pilot models of a new self-propelled 105 mm. howitzer which is amphibious, can be delivered by parachute, or carried in a helicopter, are being built by the U.S. Army Ordnance Tank Automotive Command, Detroit, Mich.

Brig Gen J. Frederick Thorlin, Commanding General of OTAC, said the full-tracked vehicle, designated the XM-104, was developed in answer to the Army's urgent request for a "heavyweight puncher with featherweight mobility."

The XM-104 pilot models are being built in the Detroit Arsenal shops of the Experimental Division of OTAC.

The XM-104 represents a new concept of self-propelled artillery. Although packing a 105 mm. howitzer, it can be stripped for air delivery by helicopter, parachute drop or groundlanding by the Army's Caribou and Air Force C-130.

Carrying a 4-man crew, it will be able to travel at 35 miles per hour, negotiate swamps and desert sand, cross rivers and lakes. Ready to go, the weapon weighs 6,400 pounds.

The XM-104 would provide ground troops with a "scatback" artillery piece which can travel anywhere in the world with airborne combat troops and go into action almost as soon as the first rifleman fires a shot. Once on line, it could follow right behind Infantry or Armor units.

Pilot model of U.S. Army's self-propelled 105 mm. howitzer, the XM-104.

National Security Industrial Association Tours Signal R&D Laboratory

MEMBERS OF THE NSIA (National Security Industrial Association) recently made their third successive annual tour of the U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J., for a briefing on significant R&D activities in progress. Shown (left to right) are Roger Fulling, E. I. duPont de Nemours and Co.; Robert M. Akin, Jr., Hudson Wire Co.; Col James M. Kimbrough, Jr., USASRDL Commander; Brig Gen Joseph A. Cranston (USA, ret.), NSIA director of special activities; Dr. Hans K. Ziegler, USASRDL Chief Scientist; J. F. X. Mannix, industrial liaison engineer for the Laboratory. The NSIA is a non-lobbying organization composed of representatives of more than 500 industrial and research firms. It was founded by the late James Forrestal, then Secretary of the Navy and later Secretary of Defense, to establish and maintain a close working relationship among the Armed Forces and industry on national defense.

Maj Gen Cook to Succeed Nelson as Signal Officer

Maj Gen Earle F. Cook, Deputy Chief Signal Officer since July 1959, will become Chief Signal Officer upon retirement of Maj Gen Ralph T. Nelson, effective June 30. General Nelson has held the office since 1959.

General Cook has served as Chief of the Research and Development Division, Office of the Chief Signal Officer, and Commanding Officer, U.S. Army Signal Research and Development Laboratory. He has been closely associated with the development of the first solar conversion for satellites and with Project SCORE, the "talking satellite" launched by the Advanced Research Projects Agency.

Upon his graduation from the U.S. Military Academy in 1927, he served three years in the Panama Canal Zone as a battery officer before he was detailed to the Signal Corps at Fort Monmouth, N.J., (1935-37). He was graduated from the Signal School in June 1939 and the Signal Intelligence School in 1942. Three years of Signal Intelligence duty in Washington, D.C., followed.

Assigned to Europe in May 1945, he was staff officer with the Signal Intelligence Division, ETO, became Director in August, and in November was appointed Chief of the Army Security Agency, Europe. Returned to the U.S., in 1948 he was graduated from the Armed Forces Staff College.

Next came tours at Fort Sam Houston, Tex., as Assistant Signal Officer at Hq, USARPAC, and as Signal Officer, Marshall Islands. After taking part in Joint Task Force No. 3, he was graduated from the National War College in July 1952. From 1952-1954, he was Commanding Officer, Signal Missile Support Agency, White Sands Missile Range, N. Mex.

Upon activation of the U.S. Army Electronic Proving Ground at Fort Huachuca, Ariz., he became Deputy Commander in January 1954, until he was reassigned as Commanding Officer, U.S. Army Signal R&D Laboratory, in June 1955.

Maj Gen Earle F. Cook

Special Course Slated For Counterinsurgency

Counterinsurgency effort is being furthered with establishment of a new high-level course at the Army's Special Warfare School, Fort Bragg, N.C., under direction of the U.S. Continental Army Command.

Classes in the Senior Officer Counterinsurgency and Special Warfare Orientation Course will begin in July. The course will provide selected senior commissioned officers and civilian personnel of the U.S. Government with general orientation on the latest doctrine and concepts of special warfare. Emphasis will be on counterinsurgency operations, paramilitary support forces, special forces operations, and psychological operations.

The 4½-day course is open to members of the active Armed Forces in the grade of colonel or higher and civilian personnel of the Government of comparable rank. Under expanding emphasis on counterinsurgency, all soldiers stationed in the United States and overseas will be given guidance and instruction.

Counterinsurgency as defined by the Army includes all military, political, economic, psychological and sociological activities directed toward preventing and suppressing resistance groups. Activity of these groups may range in degree of violence and scope from subversive political activity to violent actions by large guerrilla elements to overthrow an established government.

Signal Corps Conducts Management Intern Training Program

Six young men assigned to the U.S. Army Signal Corps in the Washington, D.C., area as the introduction to their planned Federal Civil Service careers have completed the most important phase of their one-year Management Intern Training.

The Signal Corps Management Intern Training Program is conducted under the same general policies as that of other Federal agencies.

Maj Gen R. T. Nelson, Chief Signal Officer, met with the trainees in the Pentagon following their completion of six months of rotation assignments in various Washington-area offices under his jurisdiction. They are Edward A. Steffee, Charles E. Herbert, Robert M. Philbrook, Robert Yoshida, Fred J. Kohout and James D. Dunlap. (Eighteen other Signal Corps internees are receiving specialized training at various installations throughout the United States.) General Nelson said:

"Naturally, after almost 30 years with the Signal Corps, I personally feel you have chosen the best branch of the Government with which to begin your Federal civilian careers. I also feel that you have chosen wisely in beginning your work with the Government while still young. All branches and agencies of the Government are in need of top-notch young men and women, and the fact that you were selected for this specialized training certainly indicates that you belong in this category."

General Nelson also pointed out to the trainees that they should definitely consider an overseas tour during their careers, saying "Even one overseas tour will give you a broader perspective where your own work and outlook are concerned, and will be of benefit to the Signal Corps or whichever agency you may be with at the time."

Today's Signal Corps Management Trainee Program is an outgrowth of the initial Federal Junior Management Assistant Program which placed its first trainees in Government offices in 1949. Requirements have remained basically the same.

Following a comprehensive written examination given by the Civil Service Commission, persons having the highest scores are selected for follow-up personal interviews. If an "outstanding" rating is achieved in both the written examination and personal interviews, an applicant embarks on his management intern training. The Government branch or agency to which the trainee is assigned depends upon existing vacancies and applicants' preferences.

Chief Signal Officer Maj Gen R. T. Nelson discusses the Civil Service Management Intern Trainee Program with trainees assigned to the Washington, D.C., area. (Left to right) Fred J. Kohout, Robert M. Philbrook, James W. Dunlap, Robert Yoshida, Charles E. Herbert, Edward A. Stefee.

The basic 6-months training, considered the most important because of its wide scope, is devoted to rotational assignments in broad management areas. Upon finishing this phase of training, the trainee is placed into a specific position in his selected career field. Six months of on-the-job training completes the year's "apprenticeship."

Fort Detrick RESA Sponsoring Student Seminars

Selected students in Frederick County, Md., are receiving an educational "bonus" through the efforts of a local chapter of The Scientific Research Society of America (RESA).

The bonus consists of a series of science seminars conducted by members of the local RESA chapter. The 2-hour sessions, half lecture and half discussion, span a 13-week period. All are held after normal school hours.

Participating students, 14 boys and 6 girls, were selected on the basis of scholastic achievement and expressed interest in scientific study. The seminars are designed to provide the students with advanced science education and an opportunity to discuss their interests with scientists.

The Fort Detrick Branch of RESA sponsors the seminars in cooperation with the science faculty and principal of the Frederick High School and members of the Frederick County Board of Education. Fort Detrick, located at Frederick, Md., is the site of the U.S. Army Chemical Corps' Biological Laboratories. Fort Detrick scientists donate their time.

Subjects scheduled for the seminars include life, physical and earth sciences and range from "The Scientific Approach and the Role of Mathematics" to "The Structure of Earth." Discussion topics include "Origin of Life and Evolution," genetics, "Intermediary Metabolism," "Matter, Energy and the Electromagnetic Spectrum," "Origin and Structure of the Universe," and the works of Newton and Einstein.

Each of the college-level seminars is conducted by a professional scientist working in the discipline involved. Participating scientists expressed the hope that the seminars would provide the students with additional preparation for further scientific study and stimulate their interest in a broad range of science subjects.

Dr. Clifford J. Maloney, president of the RESA chapter, credited the Science Education Committee of his chapter for the success of the program. He cited Dr. Charles R. Phillips, committee chairman, and Drs. Harold P. Feldman, Norman D. Gary, Harold A. Neufeld and Boris J. Osheroff for setting up the seminars.

NSF-I Stimulates Scientifi

Take a gifted boy or girl fired with the imaginative bright dreams of youth for new worlds to conquer in scientific research, multiply by 387, and you derive the formula of the 13th National Science Fair-International.

This highly successful display of the creative products of the brain-power of a bright new generation of scientists was staged May 2-5 at the World's Fair in Seattle, Wash.—with the support of many of the Nation's scientific institutions and the Armed Forces.

For the second consecutive year, the U.S. Army selected 16 winners whose research is in areas of interest to the Army. Their reward will be an all-expense paid one-week visit as honored guests at the Army R&D installation of their choice. The hope of the Army is that some of them may become interested in the possibilities of careers in Government service.

The National Science Fair-International is supported by the U.S. Army and the other Armed Forces, along with top-ranking scientific institutions, because it is an exhaustively selective screening process to seek out the most promising potential in building the Nation's scientific resources.

More than 25,000 Science Clubs in the continental United States and numerous foreign nations participate in more than 200 preliminary fairs. They involve some three-quarter million of students, as a preliminary to selection of about 400 finalists for the NSF-I.

A 10-year survey has shown that more than 90 percent of the finalists go on to become scientists and engineers. That accounts in part for the broad support of the program, administered by Science Service, a nonprofit institution. Its trustees include members of the National Academy of Sciences, National Research Council, American Association for the Advancement of Science, E. W. Scripps Estate, and journalists.

"Genius at work" is a sign that might be displayed, without any tint of facetiousness, before nearly every display booth at the NSF-I. Eminent scientists each year are amazed at the depth and versatility evidenced in the students' exhibits. This year, for example, U.S.

(Continued on page 20)

Fig. 1, Sandra Ann Tucker. Fig. 2, Frederick Dombrose. Fig. 3, Susan Pilger explains exhibit to Army judges Col George F. Leist (left) and Dr. G. G. Quarles. Fig. 4, David Zavadil. Fig. 5, Ronald Gilson. Fig. 6, Henry Brian Highfill explains exhibit to Army judge Dr. Eugene F. Spron. Figs. 7 and 8, Donna Gene Hayes and Robert Williams discuss exhibits with visitors. Fig. 9, Lloyd Clark with Army judge Echols. Fig. 10, Paul Tremblay.

enius of Rising Generation

The U.S. Army has invited each of 16 National Science Fair-International winners to spend a week of the summer vacation at an Army research facility in the field of his or her special interest, with all expenses paid, as follows:

U.S. Ordnance Missile Command, Huntsville, Ala., Paul Leland Andre Tremblay, 17, Coeur d'Alene Sr. H.S., Coeur d'Alene, Idaho, whose prize winning exhibit was "The Optical Maser (Gas)"; and David A. Zavadil, 18, Brookfield Central H.S., Brookfield, Wis., "Plasma Acceleration."

Army Chemical Center, Edgewood, Md., Sandra Ann Tucker, 18, Frederick H.S., Frederick, Okla., "Ionization—Its Limitless Possibilities"; and Henry Brian Highfill, 20, West H.S., Columbus, Ohio, "Guinea Pig Nervous System—Effects of Tranquilizers."

Army Engineers Center, Fort Belvoir, Va., Seth Sharr, 17, Sistersville H.S., Sistersville, W. Va., "Demineralization of Sea Water by Hydrate Formation."

U.S. Waterways Experiment Station, Vicksburg, Miss., Minette Marian Frizzell, 18, Classen H.S., Oklahoma City, Okla., "A Study of the Verdigris River Sediment."

Walter Reed Army Research Institute, Washington, D.C., Ronald A. Gilson, 17, Marshalltown Sr. H.S., Marshalltown, Iowa, "Cytological Investigations of Interferon Stimulated by Influenza PR8"; and Stephen George Waxman, 16, West Orange Mountain H.S., West Orange, N.J., "Skin Homografts in Rats."

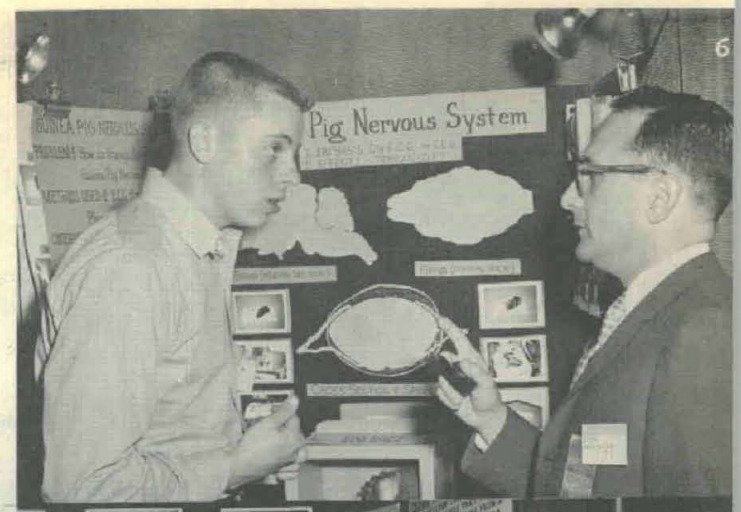
U.S. Army Ballistics Research Laboratories, Aberdeen Proving Ground, Md., Donna Gene Hayes, 18, Maumee Valley Country Day School, Maumee, Ohio, "Experimental Study of Nuclear Structure."

U.S. Army Diamond Ordnance Fuse Laboratories, Washington, D.C., Robert Karl Herman, 18, Conestoga Valley Sr. H.S., Lancaster, Pa., "An Electronic Syllable Analyzer."

Army Quartermaster Research and Engineering Command, Natick, Mass., Robert Lee Williams, 17, William Fleming H.S., Roanoke, Va., "Research Work with the Gas Chromatograph"; and Frederick A. Dombrose, 17, Sylvania H.S., Sylvania, Ohio, "Psychophysiology of Color Vision."

Army Signal Center, Fort Monmouth, N.J., Robert Bruce Cornell, 17, Marion H.S., Marion, Ind., "Activating Impurities in Crystalline Minerals"; and Susan Kay Pilger, 17, Washington-Lee H.S., Arlington, Va., "Biochemical Fuel Cell."

Army Transportation Center, Fort Eustis, Va., Raphael Belgique, 18, Granite H.S., Salt Lake City, Utah, "Radio Controlled Aircraft"; and Lloyd M. Clark, 17, Sandia H.S., Albuquerque, N. Mex., "Circulation Theory of Lift."



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Army Research Office Scientific Director Dr. Paul A. Siple stated:

"Every year I find my faith in our children rejuvenated. It lasts for about nine months. Then the juvenile delinquency talk starts to discourage me. But then comes another National Science Fair, and I know once again why America is great."

Emphasis of the NSF-I on all-around character and personality development, in the belief that the Nation's future welfare calls for other qualities of leadership than pure scientific ability, was expressed by another of the Army judges. Col George F. Leist, Chief of the Research and Development Division, Office of the Chief of Ordnance, stated:

"We want the well-rounded youngsters, the ones with many interests, not only the introverts and grinds who concentrate on a single subject. We find the youngsters in the Science Fair are not only bright and dedicated to science, but they have many other interests. Neither the Army nor anyone else in science wants youngsters who become scientific machines. We want youngsters trained to think."

U.S. Army Research Director Brig Gen Chester W. Clark, who presented certificates of achievement to the 16 Army winners at the NSF-I, stated:

"It is safe to say that a large percentage of the young people whom you saw at the Science Fair will be the famous scientists of the Nation in only a few short years. These youngsters from throughout the Nation are the cream of the crop."

Behind each of the final contestants in the NSF-I is an absorbing human interest story of youth, inspired by scientific achievement of others, striving to gain a measure of satisfaction from original research. One of these bright youngsters told a little of her story to Dr. Siple when he stopped at her exhibit on "Ionization—Its Limitless Possibilities."

Sandra Ann Tucker's story is remarkable, but in relation to other NSF-I finalists far from exceptional. Her research project called for determination of agricultural capabilities of applying the principle of an electrostatic charge to the deposition of insecticides and fungicides on plant surfaces. Investigations stemmed, she said, from "practical necessity."

Sandra's father is a Frederick, Okla., farmer who raises cotton and is troubled with the old problem of boll weevils. Throughout the growing season he sprays his crop about once a week, and getting adequate coverage of plants with conventional spraying of insecticides is not easy.

Improvising with an old electric hair dryer, the high voltage component of a discarded TV set, and a vibrator, Sandra put together her ionizing sprayer. Then she made the scientific test, on 10 acres of cotton.

Results were rewarding. Not only was the boll completely shrouded with insecticide; it was protected for the entire growing season. Actual count showed her crop was attacked by 30 percent less boll weevils than her father's crop—sprayed regularly about once a week. Also, Sandra used only about half as much insecticide as her father used each time for a like area.

With the enthusiasm of youth, Sandra believes she has achieved a real breakthrough in scientific spraying of insecticides that may have broad use in agriculture. Her confidence is backed up by a patent application.

In demonstrating the device at the NSF-I, she mounted an apple on the end of a stick. Spraying without ionization produced a cloud of dust and very poor ad-

NSF-I ARMY JUDGING PANEL: (Left to Right) Front —Charles E. McCabe, Army Research Office, OCRD; Dr. J. Fred Oesterling, Quartermaster R&D Command; Col George F. Leist, Office, Chief of Ordnance; Dr. Eugene N. Sporn, Chemical Corps R&D Command; Dr. Arthur D. Stull, Office of The Surgeon General. Rear—Marshall D. Aiken, Office, Chief Signal Officer; Dr. Paul A. Siple, Army Research Office, OCRD; Dr. G. G. Quarles, Office, Chief of Engineers; Dr. Robert L. Echols, Transportation Research Command; and 1st Lt John D. Stevens.

hesion; ionization resulted in a thin stream of dust that wrapped itself completely around the apple.

Selected for a one-week visit to the U.S. Army Chemical Center, Md., as a reward for her prize-winning exhibit, Sandra meets the aforementioned requirement for versatility of interests. Her hobbies include music, photography, vocal and drama clubs, and reading.

On the night of the NSF-I judging Sandra's heart was in two places. In her exhibit booth was a box containing a floral corsage from her boy friend, with a wistful note wishing she might have worn it to the annual high school prom that evening.

Three other girls chosen among the Army winners might present a story of research effort almost as interesting as that of Sandra Ann Tucker. For example, Minette Marian Frizzell, also a finalist at the 1961 NSF-I, is an exuberant extrovert, six feet tall, who is popular among associates for a love of laughter that conceals a very serious scientific mind.

Behind Minette's scientific interest, if you accept what she says at face value, is the variety of soils she used in making mud pies while traveling along rivers with her father, a well digger (drilling contractor) and real estate dealer. Her mother is a retired professor.

Minette's research project was a textural analysis of samples of water, collected over a distance of 350 miles of river. Composition was determined for a series of histograms and shown with cumulative curves. Relationship between the sample and the site was established and changes in down stream river sediment were determined. Minette will learn more about soils research when she visits the Army's Waterways Experiment Station at Vicksburg, Miss.

Susan Kay Pilger won a free trip to visit the U.S. Army Signal Center at Fort Monmouth, N.J., by invading the relatively new field of the biochemical fuel

(Continued on page 22)

Fig. 11, Robert Herman. Fig. 12, Robert Cornell. Fig. 13, Raphael Belgique. Fig. 14, Seth Sharr. Fig. 15, Stephen G. Waxman receives award from General Clark. Fig. 16, Minette Frizzell with General Clark.

NSF-I Stimulates Rising Generation of Scientists

(Continued from page 21)

cell. This cell was hailed as one of the exciting new advances in 1961, and Miss Pilger was intrigued by its description. Intent on a career as a microbiologist, Susan applied an imaginative mind to the fuel cell project. She conceived the idea of increasing the electrical output of the biochemical action by loading the electrode with bacteria and feeding them to stimulate their activity in decomposing organic matter. What's more, she had good results.

Donna Gene Hayes was among the top 40 winners in the 1962 Science Talent Search and a winner two years ago at the NSF-I before she finished among the top 13-winners in the recent NSF-I. Planning a career as a nuclear physics professor, she earned a trip to the Army's Aberdeen Proving Ground, Md., with her exhibit titled "Experimental Study of Nuclear Structure."

Army judges agreed that Miss Hayes' design and construction of laboratory instrument was of exceptionally high quality. Her project involved construction of a .4 MEV linear action accelerator, a Freon-13B1 bubble chamber, and a diffusion type cloud chamber to study nuclear reaction. Photographs were made of the reactions and analyzed mathematically to determine the nature of particles involved in reactions.

A 3-time winner at the NSF-I—each year since 1960—Frederick A. Dombrose will spend a week as the guest of the Quartermaster Research and Engineering Command, Natick, Mass. His project, "Psychophysiology of Color Vision," was evolved over three years of research on mechanisms involved in spectral response and differentiation. Faced with anatomical as well as physiological problems, he separated his project into topics of anatomy, neurophysiology and photochemistry.

Working toward a career as an ophthalmologist, Dombrose is a versatile youth who has won an architectural art award, a research grant, and a newspaper delivery trip to Washington, D.C. He is a member of several junior science organizations, a science and math club, and is active in the Hi-Y, drama, baseball, speech club and variety shows.

Another example of remarkable initiative in research is credited to Henry Brian Highfill, whose work was recognized by Army NSF-I judges by selection for a week of observation of animal studies at the Army Chemical Center, Md.

In the conduct of his project, "Guinea Pig Nervous System—Effects of Tranquilizers," Highfill performed the delicate operation of inserting a telescopic type plastic eye in the head of a test animal. Thus he was able to make encephalograph studies of the effects of tranquilizers upon the guinea pig nervous system.

Contemplating a career as a medical missionary, Highfill found that a guinea pig can take about 10 times more tranquilizers than a man (proportionately), and that blood and heart rate decrease and death by liver conditions develop which cause pneumonia. He has won honors in debate, was selected for a Cadet Exchange trip to Europe, is active in the Hi-Y, and has been cited for other achievements.

Paul Leland André Tremblay, at 17 a winner in the NSF-I for several years, impressed Army judges with the high quality of his research in one of the Army's potentially significan areas of investigation.

"The Optical Maser (Gas)" displayed in his exhibit showed professional scientific skill in design. He described it as powerful enough to use in communication, a tool in surgery, in complex metal fabrication, and as a possible weapon of war. He plans a career in electronics research.

David A. Zavadil earned the acclaim of judges for work in another high priority area of research insofar

Chemical Corps Picks 3 NSF-I Winners for Summer Employment in Laboratories

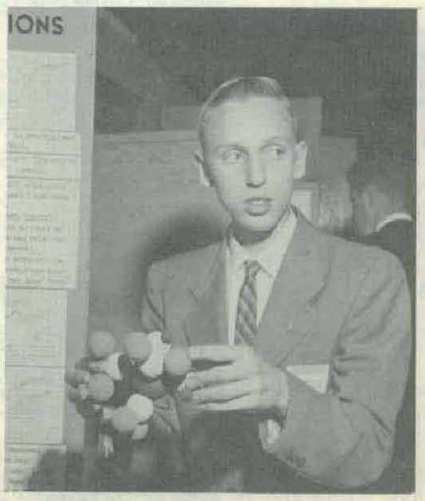
Not content to give to the National Science Fair-International the same degree of support as other Army agencies, the Chemical Corps, in addition, selected three winners and gave them salaried summer jobs.

Some of the other agencies that might have been interested in taking a cue from the Chemical Corps did not learn of the plan until too late, since it was announced shortly before the fair opened, but more widespread adoption of the summer-jobs idea in the future appears likely.

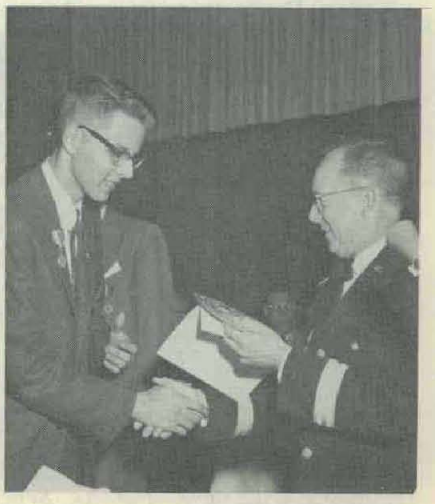
The Armed Forces Chemical Association awarded an engraved plaque and $50 travel expenses to each of the winners, namely: John Charles Schaefer, 17, Sheboygan, Wis., Raymond Clyde Roy, 17, Jacksonville, Fla., and John Taft Nicholson, 18, Alamogordo, N. Mex. Alternates are Ronald Wesley Johnson, 17, Kentland, Ind., David C. Hill, Grand Blanc, Mich., and Martin E. Walter, 17, San Jacinto, Calif.

Except that he was one of the 16 winners selected by the panel of Army judges at the 1961 NSF-I, Hill might have been considered for a visit to the Army R&D installation of his choice. He credited inspiration for his 1962 project, "Discovery and Development of a New Series of Metal Organics," to research he observed during his 1961 visit to the Quartermaster R&E Command.

Schaefer's summer-job winning exhibit was titled, "The Effects of a Cancer Chemotherapeutic Agent, 5-Fluorouracil, on **Escherichia coli.**" Roy's subject was "3D Electrons in Transition Metal Complexes." Nicholson displayed "Photovoltaic Cells."



Raymond Roy explains "3D Electrons in Transition Metal Complexes."



John C. Schaefer, Cm1C winner, receives award from Big Gen Clark.

as the Army is concerned. His project was "Plasma Acceleration," aimed at determination of plasma velocity by direct methods.

A formula for theoretical velocity has proved extremely difficult to develop, he conceded, but added that results of his tests indicate that velocities achieved are greater than those produced by chemical reactions. Zavadil, hoping for a career in physical science research, will spend a week at the U.S. Army Ordnance Missile Command, Huntsville, Ala.

Seth Sharr demonstrated exceptional promise for his planned career as a chemical engineer with his exhibit of "Demineralization of Sea Water by Hydrate Formation." His project involved the screening of a large number of possible hydrating agents, studying the thermodynamic properties of the more promising ones, and determining the effects of dissolved salt on the systems. In the process he claimed to have used 30 previously unknown hydrates. He will be a guest of the U.S. Army Engineer Center, Fort Belvoir, Va.

Robert Karl Herman, who will go to the Diamond Ordnance Fuze Laboratories, Washington, D.C., for a week of observation of projects related to his scientific interests, was recognized for his development of "An Electronic Syllable Analyzer." A finalist in the NSF-I in 1960 and 1961, he won honors this year for his demonstration of voice command control of appliances connected to a combination of electronic relays.

Stephen George Waxman, 16, showed real promise for his planned career as a medical researcher with his exhibit titled "Skin Homografts in Rats." It won him a week visit to the Walter Reed Army Institute of Research in Washington, D.C., where he will be able to observe research in the same area of investigation he has pursued.

The project for which he was recognized involved the grafting of organs from one rat to another by causing the organ to become resistant to the recipient's natural immunological rejection of the graft. To do this, he induced a mild autoimmune disease in the donor. Some control grafts lived as long as 15 days and experimental grafts an average of 23.25 days, with one surviving 32 days.

Ronald A. Gilson also won a trip to Walter Reed Army Institute of Research with his display on "Cytological Investigations of Interferon Stimulated by Influenze PB8." Seventeen years old, he has decided on a career as a doctor. His research project tested interferon against vaccinia virus in chick embryo tissue culture and produced good results.

Raphael Belgique, an 18-year-old French youth who came to the United States in 1951, exhibited a remarkable radio-controlled model aircraft. He contended it would "outperform any existing conventional radio control airplane in aerobatics."

Long interested in designing and constructing model aircraft, he hopes to become an electronic engineer. He will learn about the possibilities of pursuing his interest in advanced types of aircraft when he is a guest for one week at the U.S. Army Transportation Center, Fort Eustis.

Lloyd M. Clark also will visit the Transportation Center to learn about Army interests and research in advanced new types of specialized aircraft. He plans to become an aeronautical engineer, and his project exhibit at the NSF-1 reflected his studies of lift and drag characteristics of rotating cylinders in an airstream for possible applications to aeronautics. He concluded that application to light aircraft may be feasible.

Robert Lee Williams, at 17, has won an impressive list of honors indicative of his wide range of activities and interests. Among these are the God and Country award, the Optimist International award, the Ford Industrial Arts award, literary awards, and science fair awards since 1960. He also is an Eagle Scout with eight palms, a member of Science Clubs of America, and is contemplating a career as a research physicist.

The exhibit which won Williams a trip to the Quartermaster Research and Engineering Command, Natick, Mass., was called "Research Work with the Gas Chromatograph." He studied, designed and constructed various systems of the chromatograph. Special sealing methods were devised and a new detection and recording system was developed, permitting quantitative and qualitative analysis of gaseous and liquid mixtures.

Robert Bruce Cornell, winner of a National Merit scholarship, has diverse scientific interests, including geology, chemistry, spectroscopy, and astronomy, but plans to be a geochemist. Army judges selected him for a visit to the U.S. Army Signal Research and Development Laboratory in recognition of his research in "Activating Impurities in Crystalline Minerals." Purpose: To determine what impurities activated a particular mineral, causing it to fluoresce and luminesce.

This review has touched rather lightly on the research work of 16 of the 387 finalists who participated in the 13th National Science Fair-International. If it manages, however inadequately, to indicate that the young scientists of America constitute a tremendous force for progress —and that the U.S. Army is interested in helping them realize their potential, in the cause of national welfare—it has served its purpose.

Dr. Adams Joins USARO Long-Range Plans Staff

Dr. Thomas W. Adams is newly assigned as Research Planning Officer in the Research Planning Branch, U.S. Army Research Office.

The 28-year-old political scientist brings to his new job a variety of academic, business and administrative experience. His duties will involve providing continuity in a long-range effort to devise, develop and coordinate planning for the overall U.S. Army research effort. Planning areas include the physical, biological and medical, environmental, mathematical and psychological, and social sciences.

A native of Pittsburgh, Pa., Dr. Adams earned an A.B. degree in political science from the University of Pennsylvania (1955), a Diploma de Estudios Hispanicos from the University of Madrid (1957), and M.A. and Ph.D. degrees in government from the University of Oklahoma (1958 and 1962). He is a member of the American Political Science Association and the Academy of Political Science.

Dr. Thomas W. Adams

Reorganization of Army Progressing Ahead of Schedule

Maj Gen L. J. Lincoln

Maj Gen Lawrence J. Lincoln is the new Commanding General of the U.S. Army Engineer Center, Fort Belvoir, Va. Until he assumed his new duties this past month, he was assigned to the Office of the Deputy Chief of Staff, Logistics.

A 1933 graduate of the U.S. Military Academy, General Lincoln has held numerous high engineering posts. He holds a degree of civil engineering from Princeton University and is a graduate of the Engineer School and the Army War College.

During World War II, he served two tours of duty in the Operatons Division, War Department (OPD), receiving the Distinguished Service Medal for his second tour as Chief of the Asiatic Theater Section. He served also as the Executive Officer to General Wedemeyer on the staff of Lord Louis Mountbatten in the Southeast Asia Command.

Following the Armistice, he served as one of five U.S. Commissioners on the Joint U.S.-Soviet Commission in Korea. In 1947 he became Deputy Chief of Staff for the task force which made the 1948 Pacific atomic tests.

Other major posts include: Engineer for Headquarters, Fourth Army, Fort Sam Houston, Tex.; District Engineer in Denver, Colo., and Kansas City, Mo.; Deputy Chief of Staff for Operation; Division Engineer, Mediterranean Division, Corps of Engineers and in 1958, Director of Plans and Materiel, Office of DCSLOG.

For his services he has been awarded the Legion of Merit and the Commendation Ribbon with Oak Leaf Cluster. General Lincoln is the author of a paper on the strategy of World War II, published in the Encyclopaedia Britannica's four volume *Ten Eventful Years.*

Brig Gen Robert E. Blount

Brig Gen Robert E. Blount, MC, Director of the Army Surgeon General's Professional Service since November 1960, has been named Commanding General of the Army's Medical Research and Development Command, succeeding Maj Gen James H. Forsee.

A native of Bassfield, Miss., he earned a B.S. degree from Millsaps College, Jackson, Miss. (1928), a doctor of medicine degree from Tulane University Medical School (1932), and completed his internship in New Orleans prior to entering on active duty with the Army in July 1933.

General Blount's major posts preceding World War II included Assistant Chief of Medicine, Station Hospital, Fort Slocum, N.Y. and Chief of Medicine, Station Hospital, Fort Stotsenberg, Philippines.

Between August 1941 and September 1945, he served as Administrative Assistant to CG, Lovell General Hospital, Fort Devens, Mass., Medical Consultant, Training Division, Hq, Ninth Service Command and Commanding Officer, 129th General Hospital in the European Theater.

Other major assignments include: Assistant Chief of Medicine at Walter Reed General Hospital, Washington, D.C., and two tours as Chief of the Department of Medicine at Brooke General Hospital, Fort Sam Houston.

General Blount has published many studies in medical and military journals, and is the coauthor of the *NATO War Surgery Handbook.* He is a Fellow of the American College of Physicians, a Diplomate of the American Board of Internal Medicine, and a member of 10 other national and local medical organizations.

Progress well ahead of schedule on general reorganization of the Army leads implementation planners to anticipate that the original 18-month project completion date may be substantially decreased.

Location of the major commands was announced early in May and headquarters of subordinate elements on May 23 following notification of Congress. Most of the generals who will head the subcommands are named.

The U.S. Army Materiel Command (the Materiel Development and Logistic Command designation was changed last month) will be located in Building T-7, Gravelly Point, Washington, D.C. When the new Federal Building No. 5 in Washington is completed late in 1964 or 1965, the AMC is to move again.

The U.S. Army Combat Development Command will be located at Fort Belvoir, Va., presently the home of the U.S. Army Engineer Center and U.S. Army Engineer Research and Development Laboratories.

Most components of the U.S. Continental Army Command will remain at Fort Monroe, Va., but some elements will be located at Fort Eustis, Va., presently the headquarters of the U.S. Army Transportation Research Command.

Under the command of Lt Gen Frank S. Besson, Jr., the Army Materiel Command was activated May 8 and is scheduled to assume control of the entire Army materiel function by Aug. 1, 1962, less that of the Army Medical Service and a portion of the Corps of Engineers. Planners are expecting that most of the operational adjustments will be completed by Jan. 1, 1963, or shortly thereafter, and that subsequent changes will be relatively minor.

The Combat Development Command headed by Lt Gen John P. Daley is scheduled for activation June 20. Subordinate commands of the CDC are to be located as follows:

Combat Development Experimentation Center (CDEC) is to remain at Fort Ord, Calif.; Office, Special Weapons Development (OSWD), Fort Bliss, Tex.; Combined Arms Group, Fort Leavenworth, Kans.; Combat Service Support Group, Fort Lee, Va.; Army Institute for Advanced Studies, Carlisle Barracks, Pa. (also the home of the Army War College); Remote Area Conflict Office, Fort Belvoir, Va.

Subordinate elements of the Army Materiel Command will be located as follows: Missile Command, Redstone

Maj Gen Frank H. Britton

Maj Gen Horace F. Bigelow

Maj Gen George W. Power

Maj Gen William B. Bunker

Arsenal, Ala. Weapons Command, Rock Island Arsenal, Rock Island, Ill. Mobility Command, Detroit, Mich., presently the home of the Ordnance Tank Automotive Command. Munitions Command, Picatinny Arsenal, Dover, N.J. Electronics Command, Fort Monmouth, N.J., where the U.S. Army Signal Research and Development Laboratory is located.

Department of the Army General Orders No. 20, dated Apr. 26, established the following intra-staff realignments effective May 1: (1) placed the Director of Army Programs in the Office of the Chief of Staff; (2) incorporated the Office, Chief of Civil Affairs within the Office, Deputy Chief of Staff for Operations.

The new Office of Personnel Operations is expected to assume its functions late this month. Maj Gen Stephen R. Hanmer has been reassigned from Commanding General, Army Engineer Center, to head the OPO, thereby filling expectations that a combat arms officer would get the post.

Maj Gen Julian A. Wilson is the Deputy CG of the OPO. Until his reassignment he was Deputy to The Adjutant General. Maj Gen Harvey J. Jablonsky was reassigned from the Office of the Deputy Chief of Staff for Personnel to become OPO's Director of Officer Assignments. Brig Gen Charles E. Rust was named OPO Chief of Combat Support.

When Maj Gen Dwight E. Beach moves up to succeed Lt Gen Arthur G. Trudeau as Chief of Research and Development, effective upon Trudeau's retirement June 30, Maj Gen George W. Power will take over as Deputy CRD. General Power now is Director of Developments, OCRD.

Assignments of general staff officers to the Army Materiel Command were announced May 18, as follows:

- Maj Gen William B. Bunker, Comptroller and Director of Programs. He was reassigned from the U.S. Army Materiel Transportation Command.
- Maj Gen Frank H. Britton, Director of Research and Development, effective in July. He currently is Commanding General, XIV Army Corps.
- Brig Gen John G. Zierdt, Deputy Director of Research and Development, reassigned from the Army Ordnance Missile Command, Redstone, Ala.
- Brig Gen William H. Harris, Director of Personnel and Training. Until his reassignment he was Chief of Military History.
- Brig Gen Fred P. Campbell, Chief of Staff, reassigned from the Office of the Deputy Chief of Staff for Logistics in Washington, D.C.
- Brig Gen E. J. Gibson, Director of Procurement. His previous assignment was Commanding General, Ordnance Weapons Command, Rock Island, Ill.
- Brig Gen Bruce E. Kendall, Director of Supply, Supply and Maintenance Command, reassigned from Deputy Quartermaster General.
- Brig Gen John N. Cone, Director of Maintenance, formerly Chief of Plans and Programs, Office, Chief of Ordnance.

Chief of Staff General George H. Decker pinned a third star on the shoulder of August Schomburg May 25 in a ceremony at the Pentagon. Nomination for 3-star rank was announced in April when Lt Gen Schomburg was selected to head the Supply and Maintenance Command.

As this publication went to press, assignments of officers to staff positions in the various commands were beginning to speed up. However, only the Supply and Maintenance Command was able to announce a fairly complete list, as follows:

Brig Gen Melvin D. Losey, Director of Transportation, reassigned from Deputy Chief Transportation Officer; Col Thurston Paul, Chief of Staff; Col Victor A. Ishoy, Deputy Chief of Staff; Col A. T. McGuckin, Inspector General; George Morrissey, Civilian Personnel Officer; Col H. G. Thomas, Provost Marshal; Lt Col Karl E. Wolf, Staff Judge Advocate.

The **Newsmagazine** hopes to be able to carry an almost complete listing of staff assignments to subordinate commands of the Army Materiel Command and the Combat Developments Command in the July issue.

Brig Gen Wm. H. Harris

Brig Gen F. P. Campbell

Brig Gen John G. Zierdt

Biographical Information on Generals Assigned to AMC

MAJ GEN GEORGE W. POWER, assigned as Deputy Chief of Research and Development to succeed Maj Gen Dwight E. Beach, effective in July, has served as Director of Developments, OCRD, since April 1960. Prior to that he was Deputy CG of the U.S. Army Air Defense Center at Fort Bliss, Tex.

A graduate of the U.S. Military Academy, Class of 1932 (Artillery), he served with the 247th Field Artillery Battalion of the "Americal" Division in the South and Southwest Pacific Theaters in World War II. He took part in operations on Guadalcanal, Bougainville, Leyte and Cebu.

Following his return to the United States, he attended the Command and General Staff College at Fort Leavenworth, Kans., and then was assigned as an assistant professor of military science and tactics at the University of Illinois. In 1949 he was returned to Japan and the outbreak of the Korean War put him at General MacArthur's headquarters in Tokyo.

Returned to the United States in 1951, he attended the Army War College at Carlisle Barracks, Pa., and then was assigned to the Pentagon, Washington, D.C., as Deputy Secretary of the General Staff, Office of the Chief of Staff. One-year assignments followed at Fort Lewis, Wash., and Headquarters, Fifth Army, Chicago.

General Power served his third Far East tour in Korea from November 1956 until March 1958. Assigned first as Chief of Staff, he became Artillery Commander of the 24th Infantry Division. Upon his return to the United States, he was assigned as CG of the First Guided Missile Brigade, U.S. Army Air Defense Center, Fort Bliss, Tex. Its mission was to train Free World air defense organizations equipped with Nike Ajax and Nike Hercules missiles.

MAJ GEN BRITTON: Frank H. Britton, assigned as Director of Research and Development, Army Materiel Command, has served since September 1961 as CG, Hq., XIV Corps. A native of Shreveport, La., he was graduated from the United States Military Academy in 1932. Until World War II he served as an instructor at the Military Academy and with Armored divisions.

Following tours in the Mediterranean Theater and in Italy, he was assigned to the Southwest Pacific Theater in 1944, joining General MacArthur's headquarters in New Guinea. During the Philippine Campaign, he participated in the landing on Leyte.

As the Executive of the Advance G3 Section, he took part in organizing the occupation of Japan. In 1946 he went to Korea to serve as one of three military members of the 5-man U.S. delegation to the Joint U.S.-U.S.S.R. Commission for Korea.

Returning to the U.S. in 1947, he was assigned to the War Department General Staff. After graduating from the Armed Force Staff College, he served in the Office of the Chief of Staff as an Assistant Secretary of the General Staff. Following graduation from the Army War College in 1952, he was assigned to Headquarters, Allied Land Forces, Central Europe, where he was concerned with organization and equipment activities of NATO forces.

Other major positions held include Chief of Staff of the 1st Armored Division, Fort Polk, La.; Chief, Armor Branch, Career Management Division, Office of the Adjutant General and Director of Developments, OCRD.

General Britton achieved 2-star rank in February 1961 when he was Assistant Division Commander, 1st Cavalry Division, USAPARC, Korea.

MAJ GEN HORACE F. BIGELOW, Deputy Chief of Ordnance since February 1960, became Chief of Ordnance effective May 31 upon the retirement of Lt Gen John H. Hinrichs.

With the scheduled phase-out of the office of Chief of Ordnance, as part of the broad reorganization of the Army now underway, General Bigelow will become Assistant Deputy Chief of Staff for Logistics (Programs and Budget), effective July 1.

A veteran of 20 years with the Ordnance Corps, he was graduated from the United States Military Academy in 1932.

During World War II, he commanded the 232nd Ordnance Base depot in the Peninsula Base Section, Italy. In this post, he provided logistical support to General Mark Clark's Fifth U.S. Army during its advance from Rome to the Po Valley.

Following the German surrender in Italy, General Bigelow directed Ordnance operations in the rehabilitation of weapons and combat equipment for redeployment to the Far East and use against the Japanese forces.

After the war he served at Headquarters, Mediterranean Theater of Operations, then with the Ordnance Board in Washington, D.C., and later as Chief of the Arms and Ammunition Division, Development and Proof Services, Aberdeen Proving Ground.

Following graduation from the Army War College, General Bigelow served in the Field Service Division, Office of the Chief of Ordnance, and as commander of Letterkenny Ordnance Depot before he was assigned to Headquarters, U.S. Army Japan/

Deputy Director at CmlC Lab Honored on Retirement

Wendell H. Kayser, former Deputy Director of development at the U.S. Army Chemical Corps Biological Laboratories, Fort Detrick, Md., was honored with the Department of Army Meritorious Civilian Service Award prior to his retirement recently after more than 20 years of Federal service.

A native of San Diego, Calif., he received his B.S. degree in mechanical engineering from the Massachusetts Institute of Technology in 1918. He worked as a machine designer for the U.S. Government Engineering Service for one year, then spent more than 20 years in industry as an engineer, and re-entered Government service in 1941 in the Office of Chief, Chemical Warfare Service.

In 1942, Mr. Kayser received a direct commission as a major in the Chemical Warfare Service. During World War II, he served as Chief, Offensive Material Branch, Chemical Warfare Center, Edgewood Arsenal, until he left the active Army as a lieutenant colonel in 1946.

In the same position he remained as a civilian until 1950, when he transferred to Fort Detrick. He became Deputy Director of development at the Biological Laboratories in 1954, sharing responsibility for all research and development of biological munitions, agent products, and agent processes.

Wendell H. Kayser

United Nations Command, Eighth U.S. Army. In 1958 he was reassigned as Assistant Chief of Ordnance for Manpower, Office of the Chief of Ordnance, Washington, D.C.

MAJ GEN WILLIAM B. BUNKER, now assigned as Comptroller and Director of Programs for the Army Materiel Command, had served since May 1956 as CG of the U.S. Army Transportation Materiel Command, St. Louis, Mo., and its forerunner, the Transportation Supply and Maintenance Command.

Upon his graduation from the U.S. Military Academy, in 1934, he was commissioned in the Cavalry. After transferring to the Corps of Engineers in 1936, he attended the Massachusetts Institute of Technology and was graduated with an M.S. degree in engineering in 1937. Two years later he was graduated from the Engineer School, and then served three years in Nacaragua.

During World War II, he was the deputy in charge of the Transportation Corps' supply program. In 1945 he made a 6-month transportation survey of Paraguay for the State Department, then spent three years in Europe in railway and operations work. When the Berlin Airlift was started in 1948, he was placed in charge of terminal operations.

After serving as Chief, Railway Transportation Service Division, Office of the Chief of Transportation, Washington, D.C., he was assigned as Chief, Air Transport Division, and in March 1954 became Assistant Chief of Transportation (Army Aviation). In August 1954 he was reassigned as Commandant of the Transportation School at Fort Eustis, Va.

BRIG GEN WILLIAM H. HARRIS, newly assigned as Director of Personnel and Training, Army Materiel Command, has been Chief, Personnel Division, The Adjutant General's Office since November 1958. He was graduated from the United States Military Academy and commissioned in the Coast Artillery in 1930.

More than 11 years later, following assignments in the Panama Canal Zone and at various stations in the U.S., he was detailed to General Staff with troops. He was the only officer of captain rank in that capacity.

In December 1942 he was assigned as Assistant Chief of Staff, G-4, for the United States Army Forces, South Atlantic, with station at Recife, Brazil. Later appointed Chief of Staff of that command, he remained there until he was reassigned in June 1944 to the War Department General Staff as Chief of Special Projects for the G-4.

Serving in various War Department G-4 staff assignments, including membership on the Joint Planning Committee for the Joint Chiefs of Staff until October 1945, General Harris was awarded the Army Commendation Medal for his work in planning logistical support of military operations.

From 1945 to 1947 he served as Chief of Services, Office of the Assitant Secretary of War, and as an administrative officer for the War Department Central Intelligence Group. In August 1947, he transferred to The Adjutant General's Corps and later became one of the first officers assigned to the newly created Office of Comptroller of the Army.

Following three years of duty as the Adjutant General, Fourth United States Army at Fort Sam Houston, Tex., he was assigned in 1952 as a member of the staff and faculty of the Armed Forces Staff College. In 1954 he was promoted to 2-star rank and assigned as Adjutant General, Supreme Headquarters Allied Powers Europe.

Pope Pius XII awarded him the Golden Medal "Benemerenti" for his leadership in religious activities throughout his career in the Armed Forces.

BRIG GEN ZIERDT: Assigned as Deputy Director of Research and Development in the Army Materiel Command, John G. Zierdt has commanded the Army Rocket and Guided Missile Agency, (ARGMA), an element of the U.S. Army Ordnance Missile Command (AOMC), since June 1960.

General Zierdt was Chief of Staff of AOMC from March 1958 until January 1960. Then he joined ARGMA to take charge of the Agency's Nike Zeus program. Prior to the AOMC assignment, he was Chief of the Control Office of the Army Ballistic Missile Agency, which he joined in 1956.

The general was graduated from the United States Military Academy in 1937, did graduate work at the Massachusetts Institute of Technology and has attended Trinity College.

During World War II he served as Ordnance Staff Officer in Panama and the European Theater, participating in the campaigns of Normandy, Northern France, the Rhienland and Central Europe. In July 1945, he became Executive Officer of Headquarters, U.S. Strategic Bombing Survey.

Other major posts held include CO, Milan Arsenal in Tennessee; Executive Officer, Ordnance Ammunition Center, Joliet, Ill.; and Chief, Ammunition Branch, Office of Ordnance. He has graduated from the Command and General Staff College and the Army War College.

Blood Specialist Assigned

Lt Col Donald L. Howie, MC, a specialist in blood and blood-forming tissues, recently was assigned to the U.S. Army Medical Research and Development Command as Assistant Chief of the Medical Research Branch.

Since 1950, he had been Assistant Chief of the Department of Hematology and Deputy Director of the Division of Medicine at Walter Reed Army Institute of Research, Wash., D.C.

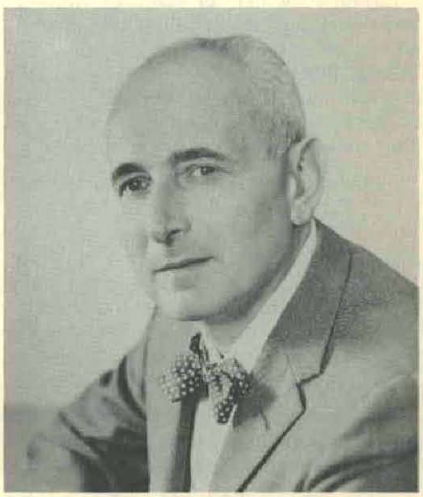
DOFL Raises Dr. Kalmus to Chief Scientist, PL-313

Appointment of Dr. Henry P. Kalmus as Chief Scientist has been announced by the Army's Diamond Ordnance Fuze Laboratories (DOFL), Washington, D.C. The appointment is one of DOFL's new senior positions assigned under Public Law 313.

Dr. Kalmus was born in Vienna and received his training at the Technical University of Vienna. After serving as an engineer with the Orion Radio Corp., Budapest, and the Emerson Corp., N.Y., he joined the Zenith Radio Corp., Chicago, in 1941.

In 1948, he accepted a position with the Ordnance Electronics Division of the National Bureau of Standards, one of the divisions from which DOFL was formed in 1953. He has been an Associate Technical Director 4 years.

Dr. Kalmus has written many technical papers and holds more than 30 patents in the field of electronics and applied physics. He is a Fellow of the Institute of Radio Engineers, a member of the Washington Academy of Sciences, and recipient of the Gold Medal Awards for Exceptional Services from the Department of Commerce and Department of the Army.



Dr. Henry P. Kalmus

Computers Control Artillery in White Plan III Demonstration at USAEPG

Automatic data processing was applied to artillery fire control and fire planning at Fort Huachuca, Ariz., in a recent demonstration (White Plan III) for the Weapons Systems Evaluation Group, Department of Defense.

Present were Lt Gen William P. Ennis, Jr., WSEG Director, Maj Gen Ralph R. Mace, 14 WSEG members, and 10 members of the staff of the U.S. Army Artillery and Missile School at Fort Sill, Okla. Other attendees included representatives of the Air Force, Navy and Marines. Maj Gen F. F. Uhrhane, Commanding General, U.S. Army Electronic Proving Ground, was host.

The demonstration was an updated version of White Plan I which was presented in October 1960, and repeated as White Plan II in March 1961, for more than 20 General Officers of the Army, including General Herbert B. Powell, Commanding General, U.S. Continental Army Command, and Lt Gen Arthur G. Trudeau, Chief of Army Research and Development.

White Plan was developed and executed jointly by the USAAMS at Fort Sill, the Automatic Data Processing Department at the USAEPG, Fort Huachuca, and the latter's technical assistance contractor, the Ramo-Wooldridge Division of Thompson Ramo-Wooldridge, Inc. Lt Col Charles H. Burr is Chief of the ADP Department at the Army's Electronic Proving Ground and Lt Col David E. Wright was Project Officer for the Artillery and Missile School.

Two artillery batteries, using 105 mm. and 155 mm. howitzers, participated in the White Plan III exercise. An IBM 709 simulated mobile field equipment which is soon to undergo field tests. (The FIELDATA family of mobile computers includes the BASICPAC which is transported in a 2½-ton truck and the MOBIDIC, Mobile Digital Computer, which is transported in two 10-ton vans.)

Officials witnessed the entire operation through closed circuit television. As briefing officers described the simulated tactical situation and explained the fire plan, television cameras were focused on the computer center, the artillery batteries and the impact area to transmit pictures to the Command Control point.

For contrast, conventional "target of opportunity" firing was demonstrated first, using a forward observer to adjust artillery fires. This was followed by an exhibition of the computer's capability to calculate automatically fire control data such as survey team reports, wind direction and velocity, powder temperatures and other variable factors to provide increased accuracy.

Information is fed into computers for use in artillery fire control planning during White Plan III. At the computer center are (left to right) Raleigh Anderson, programing analyst, Ramo-Woolridge; Capt J. Coomer, artillery liaison officer, USAAMS; Bill Workman, chief systems analyst, fire support system, Ramo-Woolridge; and M/Sgt F. Lazar, USAEPG.

White Plan III exhibited portions of the Fire Support System which is the first of the Army's overall systems of providing tactical ADP to the Army Field Commander. As the Fire Support program progresses, the White Plan will be followed by the Orange Plan which calls for similar exercises with computer systems especially desiged for use in the field. Delivery of this FIELDATA equipment to Fort Huachuca has begun.

Fire support battery prepares to fire 155 mm. howitzer during White Plan III exercise at Fort Huachuca, Ariz.

Armed Services Join in Shock, Vibration Symposium

The 31st Symposium on Shock, Vibration and Associated Environments is expected to draw about 800 scientists and engineers to Phoenix, Ariz., Oct. 1-4. The theme is "Application of Environmental Data to Specifications and Design Criteria."

Arrangements are in charge of a committee representative of the Office of the Director of Defense Research and Engineering and the U.S. Naval Research Laboratory. Participants will be largely representative of the Armed Forces and the National Aeronautics and Space Administration.

Opening with a general session on "Environmental Problems of the Next Ten Years," the Symposium will have six formal and four panel sessions.

Views of the Military Services will be presented by Dr. Paul A. Siple, Scientific Adviser, U.S. Army Research Office; Dr. R. O. Burns, Director, Technical Analysis and Advisory Group, Office of the Chief of Naval Operations (Development); and Dr. K. Millsaps, Executive Director, Air Force Office of Scientific Research. A NASA speaker will be named later.

Topics for the formal sessions are expected to be chosen from the following: 1. application of statistics to testing and design, 2. sequential versus combined environmental testing, 3. probability of occurrence of extreme environments, 4. new or newly verified environmental data, 5. instrumentation and data analysis, 6. predictions of environments for design purposes, and 7. use of data for hardware design and specifications.

Submission of papers on formal session topics or on subjects related to the central theme is encouraged. Deadline for submission is July 9. Further information may be obtained by writing to Code 4021, U.S. Naval Research Lab., Washington 25, D.C.

WSMR Signal Support Agency Refutes Adage About Weather by Meteorological Forecasts

Only fools and strangers try to predict the weather in the Southwestern United States, the saying goes. Still, the Signal Missile Support Agency, celebrating the first anniversary of its weather forecasting operation at White Sands Missile Range, N. Mex., has refuted this statement.

The Signal Agency took over this operation from the Air Force, formed the Meteorological Support Group to carry it out, and has posted a record of forecasting accuracy.

SMSA's Met Support Group operates a network of more than 50 stations spread over 5,600 square miles of desert and mountains to give advance information on weather to the men who fire missiles. The network is tied together by radio and telephone for instant communications.

Balloons carrying a radio transmitter soar as high as 125,000 feet to send back weather information on wind speeds and temperatures. Microphones buried in the ground in triangular arrays at 14 stations on the range gather acoustic information on missile trajectory that is used to predict impact.

A computer installed near the Navy blockhouse is fed data from theodolites tracking balloons and turns out a precise graph "profile" of wind speeds up to 100,000 feet at all points of the compass.

Instruments at the central control station in the headquarters area at WSMR measure humidity, dew point, and such factors as minimum and maximum temperatures used in preparing the daily general forecast.

A military-civilian crew of expert forecasters receives weather information from the rest of the country on facsimile machines and coordinates this data with local conditions to prepare maps showing the march of the weather through the Southwest.

M/Sgt D. Prescott and Marjorie Hoidale, employees of the Signal Missile Support Agency at WSMR, study march of fronts on map as they prepare to turn out a weather forecast.

Operations mark a return by the Army Signal Corps to the same area where a 10-year-old Corps operated the Nation's first weather predicting system in 1870. Signalmen stationed on a telegraph line between El Paso, Tex., and Yuma, Ariz., then flashed the weather "probabilities" to the rest of the country.

Signal Corps Engineer Designs Tiny Transmitter-Receiver for High Sky

A radio transmitter and receiver weighing less than three ounces has been developed by a young engineer of the U.S. Army Signal Missile Support Agency, White Sands Missile Range, N. Mex., to explore the mysteries of the high sky.

Believed to be the smallest 4-channel radio ever designed to be fired aloft in a rocket, the device was designed and built by Claude A. (Skeet) Steffey. It is only an inch wide and six inches long. It rides as high as 40 miles above the earth in the tail section of a Loki Dart rocket that is only a yard long, boosted to 3,900 miles an hour out of a launching tube.

The tiny radio transmits information about the atmosphere on its four channels. Each channel can be adjusted to radio data on such factors as temperature, density, electronic particle formation, and other high sky information that is needed in designing space vehicles.

During its ride to the top of the earth's air envelope, the miniature radio can battle temperatures ranging from minus 165 degrees to 500 degrees above zero, as well as extreme shocks and vibrations.

Steffey made many electronic circuit stages serve multiple purposes, to keep the unit small. When his preliminary design circuit was as compact as possible, he converted it into "modular" stages, tiny bits of metal that look like fasteners on a woman's dress and snap together.

The assembled radio then was dipped in a silicone-rubber compound that protects it against shock when it jells. A thin shell of ceramic material encases the assembly.

The radio is ejected from the Loki Dart at peak altitude and an attached parachute pops open to take it slowly to earth, radioing information as it drops. The metalized parachute is tracked by radar to measure wind speeds. From frequent firings, scientists will assemble a mass of information about the atmosphere.

Claude A. Steffey, WSMR design engineer, fits 3-ounce, 4-channel radio into fin assembly of a Loki Dart rocket. A miniature battery is located at the base of the fins. L-shaped cuts in fins form a perfect antenna.

A lean, intense man who looks the part of a design engineer in research and development work, Steffey stated his philosophy in designing the diminutive radio by saying:

"We have to forget about conventional circuits in electronics today and break through into the new, the unusual, and the unknown."

Chemist Wins Award, $250 For Pure Water Equipment

Maurice Pressman, a chemist in the Sanitary Sciences Branch of the U.S. Army Engineer R&D Laboratories, was presented a Special Act and Service Award Certificate, along with $250, for his work in improving equipment for water demineralization and decontamination. Col J. H. Kerkering, Director, made the presentation.

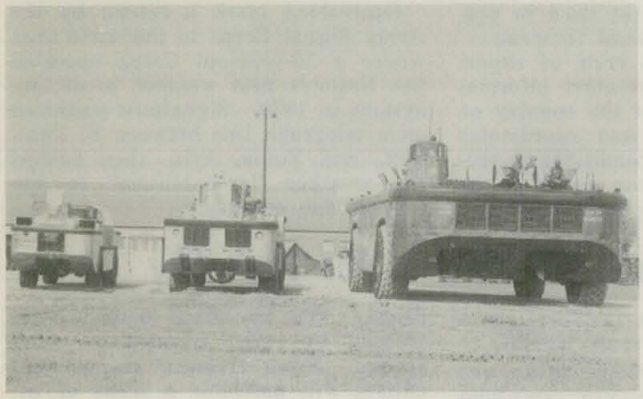
The method developed by Mr. Pressman uses easily transportable solid chemicals, rather than liquid chemicals, as a regenerant of resinous materials.

A graduate of Worcester Polytechnic Institute, Mr. Pressman was employed by the District of Columbia Department of Sanitary Engineering for three years prior to joining the Laboratories at Fort Belvoir in 1958.

Examples of Tracked and Wheeled Vehicles for Off-Road Mobility Needs

M-113 armored personnel carrier in combat maneuvers.

Ordnance Corps' M-116 one-ton amphibious cargo carrier.



Wheeled Amphibians—LARC-5, LARC-15, 60-ton BARC.

GOER emerges from water in off-road mobility tests.

(Continude from page 2)

new, that to date, it has been pioneered largely by the U.S. Army and a few commercial oil, mining and exploration companies whose research has been spurred on by the profit motive. Military leaders, aware that the stepped-up pace of modern warfare will leave little opportunity for construction of hard roads in the battle zones of the future, have been accelerating efforts.

Great strides have been made, however, both by industry and the Military Services. Unfortunately, initial successes in off-road development coupled with a still prevalent affinity toward on-highway thinking has tended to encumber this progress. This thinking continues to crop up in military specifications.

Men given the task of writing military specifications for a new off-road vehicle have long been suspect of moulding the new document on the specifications for the 2½-ton truck, then proceeding to add the "nice to have" features which are in current demand. Were designers to heed all military users, the result would be an off-road, air, water, ground vehicle resembling p. 2 sketch.

Preparation of realistic military specifications is the first and most important step; if progress is to continue, it deserves first priority. Superior off-road mobility calls for special design and often demands the compromise of other desired military characteristics. If extreme speed is desired, such as an Indianapolis racer possesses, or extreme load carrying capacity, such as the giant earth-movers, or extreme reliability, such as marine propulsive systems, one must be willing to accept demands of the extreme requirement and submerge desires to incorporate "nice to have" features.

Additionally, initial development successes have split developers into diverse groups. Most common among these are the adherents of the "tracked" versus the "wheeled" vehicle. Vehicles have been designed, built and tested—both tracked and pneumatic tire—that will successfully cope with marsh lands, water crossings, soft soils and snow. In the present state-of-the-art they can be built but often only with undesirable width and length, and limited speed.

Each has obvious advantages. The tracked vehicle, for example, presents a low silhouette and is obviously a superior combat vehicle. The Ordnance

(Continued on page 31)

Signal Corps Announces Development of ISCAN

Improved trans-oceanic communication is possible with a new short-wave antenna developed by the U.S. Army Signal Corps under contract. The system is designated ISCAN, for electronically-steered Inertialess Steerable Communication Antenna.

Severe interference is eliminated by the use of 24 simple vertical dipole antennas, a processing center to combine signals through relay lines, and underground cables connecting the antennas to the center.

In tests, short pulses were beamed approximately 4,000 miles from a West German transmitter to the ISCAN site near La Plata, Md. Through ISCAN, various echo signals weer channeled to separate receivers employing all electronic switches. A conventional antenna would have used five separate echo pulses of various strengths, each arriving at a different angle and time spread over several thousandths of a second.

The ISCAN project was initited and directed by Dr. Helmut Brueckmann of the U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J., under contract with the AVCO Corp., Cincinnati, Ohio.

Pros, Cons of Off-Road Mobility Design Discussed

(Continued from page 30)

Corps M-113 Armored Personnel Carrier is an outstanding vehicle for its purpose, as is the recently developed M-116, 1½-ton Amphibious Cargo Carrier. Tire vehicles, however, are capable of higher speeds on and off the highway.

Each system also has its drawbacks. Tires and other rubber products, such as hydraulic hoses, become brittle and break at extremely low temperatures. A tire built to withstand Arctic temperatures is likely to disintegrate when used in the desert. Likewise, much research remains to be done in the development of superior tracks. Present tracks have a short service life; they require constant maintenance and replacement.

Tracked and pneumatic tire vehicle designers must pool their technical knowledge, must submerge their pre-conceived phobias, must cooperate in their studies—or desired progress in off-road design will continue to be retarded.

Designers of industrial off-road vehicles have certain advantages over their military counterparts. They can confine their efforts to coping with the specific set of problems presented by a particular environment. They do not have to meet Berne clearance requirements, restricted bridge or axle loadings, and other stringent military characteristics which demand an operating capability in extremes of temperature (−70 F. to 125 F.) and in all worldwide environments. Their goal is simply the design of a practical, dependable and economical vehicle which will do a particular job.

Consequently, the industrial designs do not usually offer the versatility the Army seeks in its vehicles, though the military designer can profit greatly from giving them close scrutiny. Such vehicles are not frozen in design; the art is in constant state of flux and advancement, certain fundamental principles have been demonstrated and proven.

Many industrial designs can be readily and advantageously incorporated into military designs. A good example is the Army's experimental GOER vehicle, closely patterned after the large wheeled commercial earth-mover equipment.

The Army's new wheeled amphibians have shown remarkable mobility on the water, in heavy surf and on soft beaches. Designed around the concept of a boat with wheels, their ancestry can be traced directly to the WW II DUKW. Designers of the DUKW hand-wrapped a sheet metal hull around a tried and proven truck chassis to produce, in short time, a truly remarkable vehicle.

What these men were able to accomplish under wartime urgency proves what can be done in the way of improvisation. Under less urgency, the new concepts can be carried to a higher state of perfection. At the same time, we should never become so inflexible in our thinking as to insist that all developments proceed from radically new concepts.

Research in ground effects machines should continue. Similarly, concepts that combine the ground contact characteristics of the pneumatic tire with the tractive efficiency of the track layer deserve sympathetic study. Military designers must keep an open mind with respect to any development which shows promise of overcoming any aspect of the ground mobility problem.

The truly universal military off-road vehicle has never been designed. In the present state-of-the-art, it may not even be attainable. Researchers and designers, however, should look forward to developing a military ground vehicle which will be as superior in its off-road performance as the motor truck of today is superior to its World War I ancestor. And it should be attainable without having to accept the corresponding physical and service limitations which development of such vehicles currently impose.

Richard C. Kerr, Chief Scientist, Army Transportation Corps, is a recognized authority on transportation and logistics, with particular emphasis on off-road transportation.

For many years he was associated with the Arabian American Oil Co. in charge of producing and transportation operations. Following his retirement from ARAMCO in 1957 he was active as a consultant to the Army and a number of industrial concerns until appointed to his present position in November 1959.

As a part-time consultant to the Transportation Corps from 1950 to 1959, he influenced the design of a number of Army off-road vehicles, amphibian craft and large pneumatic tires.

Richard C. Kerr

Mr. Kerr is a graduate of the University of California. His long engineering and research experience has included geological exploration and work in geophysics, petroleum engineering and exploration logistics. During World War II, he engaged in logistics research for the Army Engineer Board, Fort Belvoir, Va., earning the Army's Exception Civilian Service Award.

SCIENTIFIC CALENDAR

Third biennial Army Science Conference, United States Military Academy, West Point, N. Y., June 20-22.

Conference on Standards & Electronic Measurements, sponsored by IRE, AIEE and National Bureau of Standards, Boulder, Colo., June 14-16.

7th Military-Industry Missile & Space Reliability Symposium, sponsored by DDR&E, with Army, Navy, AF and Industry, San Diego, Calif., June 18-21.

4th U.S. Congress on Theoretical & Applied Mechanics, Berkeley, Calif., June 18-21.

International Conference on Applied Spectroscopy, College Park, Md., June 18-22.

International Symposium on Continuous Culture of Microorganisms, Prague, Czechoslovakia, June 18-23.

First Biannual Polymer Symposium, sponsored by the American Chemical Society, East Lansing, Mich., June 20-22.

Long Term Climatic Variations, sponsored by AFCRL and NRC, Aspen, Colo., June 20-24.

6th National Convention on Military Electronics, sponsored by IRE, Washington, D. C., June 25-27.

ASTM Materials Testing Exhibit, N.Y.C., June 25-29.

Symposium on the Theoretical Interpretation of Upper Atmosphere Emissions, Paris, France, June 25-29.

7th International Conference on Coordination -Chemistry, Stockholm, Sweden, June 25-29.

International Colloquium on Partial Differential Equations, Paris, France, June 25-30.

International Symposium on the Physics & Chemistry of High Pressures, London, England, June 26-28.

Third International Symposium on Rarefied Gas Dynamics, sponsored by AFOSR, ONR and NASA, Paris, France, June 26-29.

Joint Automatic Control Conference, sponsored by IRE, AIEE, ISA, ASME and the American Institute of Chemical Engineers, N.Y.C., June 27-29.

9th Annual Meeting of the National Society of Nuclear Medicine, Dallas, Tex., June 27-30.

3rd International Conference on Operational Research, Oslo, Norway, July 1-5.

International Colloquium on the Structure of Solid Metallic Solutions, Orsay, France, July 2-4.

Symposium on Inter-Action Phenomena in Plasmas, Goteborg, Sweden, July 2-4.

Symposium on the Effects of Ionizing Radiation at the Molecular Level, Brno, Czechoslovakia, July 2-6.

International Conference of Magnetic & Electric Resonance & Relaxation, Eindhoven, Netherlands, July 2-7.

Review of Refractory Metal Program, sponsored by AGARD, Paris, France, July 9-11.

Round Table Discussion of Fluid Dynamics Panel, sponsored by AGARD, Paris, France, July 9-11.

11th International Astrophysics Symposium, Liege, Belgium, July 9-11.

12th AGARD General Assembly, Paris, France, July 12-13.

International Instrumentation Conference, Hamburg, Germany, July 16-18.

Second International Symposium on Fluorine Chemistry, Estes Park, Colo., July 17-20.

International Conference on the Physics of Semi-Conductors, sponsored by the Physics & Physical Society, Exeter, England, July 16-20.

Data Acquisition and Processing in Medicine & Biology, Rochester, N. Y., July 18-19.

Eighth Congress of International Union Against Cancer, Moscow, U.S.S.R., July 23-28.

Symposium in Commemoration of the 50th Anniversary of the Discovery of X-Ray Diffraction and of Crystal-Structure Analysis, sponsored by the International Union of Crystallography, Munich, Germany, July 24-27.

Army-Navy Researchers Chart 8 New Islands in Antarctica

Discovery of eight hitherto unknown islands is among significant new findings in the Antarctic by the Navy and two scientists of the U.S. Army Signal Corps.

The islands are charted and photographed but still unnamed. They were sighted during the course of Operation Deepfreeze 62 by the Navy icebreaker *USS Glacier* during a 20-day exploratory voyage made in January and February along the coastal fringes of the Ross Sea from McMurdo Sound to Marie Byrd Land.

The Signal Corps scientists who made the exploratory trip are Amory H. ("Bud") Waite, Jr., and Stanley J. Schmidt, Institute for Exploratory Research, U.S. Army Signal Research and Development Laboratory at Fort Monmouth, N.J. Their primary mission was to continue the radio propagation studies the Signal Laboratory has been making for several years.

An important part of this work entails use of a means pioneered by Mr. Waite to measure the depth of thick polar icecaps by bouncing radio signals off the soil or water beneath. During the recent trip, such soundings were made for the first time from a helicopter in flight.

The exploratory program in which Mr. Waite and Mr. Schmidt took part engaged more than 25 Government agencies, universities and research establishments. Studies included geology, biology, glaciology, gravity, meteorology, mapping, oceanography, seismology, upper atmospheric physics and communications research.

U.S. work was coordinated by the National Science Foundation's U.S. Antarctic Research Project and the Military Services. Logistic support was provided by the Navy's Task Force 43, commanded by Rear Adm David M. Tyree.

With the *USS Glacier* serving as the flagship for Capt Edwin A. McDonald, five ships left Port Lyttleton, New Zealand, Nov. 9 and arrived at McMurdo Sound, Antarctica, Nov. 25 —a month earlier than any cargo ship had ever before reached the area during spring shipping movements.

Using the two helicopters carried by the *USS Glacier*, Waite and Schmidt made seven ice-sounding flights in the McMurdo region, and another along the northern edge of the vast Ross Ice Shelf.

The exploratory voyage of the Glacier eastward along the edge of the Ross Sea began Jan. 21. One of the Navy's purposes was to seek out a suitable landing spot in order to shorten supply lines to the U.S. station in the interior of Marie Byrd Land. Helicopter flights were made to measure the ice at Little America II, and at Little America V.

In Sulzberger Bay, a survey party went ashore to map the Scott Nunataks area. After leaving there, another ice-sounding flight was launched, during which a huge submarine ridge, near the Ruppert Coast, was found under 1,200 feet of ice.

A helicopter flight was made in the area along a 60-mile zig-zag course to plot the hitherto unsounded ice-buried coastline of the Getz Ice Shelf, which is indented by Wrigley Gulf. The *USS Glacier* then moved on to Shepard Island.

In the western edge of Wrigley Gulf, Mr. Waite, standing at the rail with binoculars, spotted one of the eight islands discovered on the trip. About four miles long and 3½ miles wide, its permanence was proved by a radio-sounding flight which showed 279 feet of ice overlying firm rock that rose more than 300 feet above sea level. The solidity of the other seven islands was confirmed by visible rock formations and by the ship's navigator using regular radar.

In Wrigley Gulf, with Mount Ruth Siple (named for the wife of Dr. Paul A. Siple, U.S. Army Research Scientific Adviser) looming 80 miles away in the sunlight, time ran out. The *USS Glacier* turned back to McMurdo. The log showed it had crossed 64 degrees of longitude, from 154 to 90 West, fighting heavy ice much of the way. The voyage leaves only 375 miles of coastline on the South American side of the Antarctic unsurveyed from the sea, Mr. Waite said, adding:

"Going back was not quite the job that the trip out had been. Sometimes we followed the outbound path. On other stretches we veered off ten miles or so to find out as much about the new area as we could. Every bit of the bottom under our path was charted by the *Glacier's* sonar, and several submarine ridges were found in addition to the one discovered by radio sounding."

At Little America V, an ice-sounding flight was launched and a stranded mapping party was brought aboard the ship. On Feb. 9, the *USS Glacier* made it back into McMurdo Sound, 20 days after the exploratory voyage had begun. Waite and Schmidt obtained over 30 miles of bottom profile during the sounding flights. Other radio depth measurements were made from the surface. They recorded ice depths down to 1,285 feet while flying at altitudes that ranged from near-zero to 1,200 feet.

The radio-sounding method requires transmitting radio signals downward and recording the echoes as they return from the underlying earth or water and show up as pips on an oscilloscope scaled in feet. Allowance is made for the fact that radio waves travel through ice at approximately half the 186,000-mile velocity at which they move through space.

Amory H. Waite, Jr., U.S. Army Signal Corps engineer, is welcomed into the Mutual Admiration Society at the South Pole by Lt Malcolm W. Lenz, Navy Medical Corps, in charge of the Amundsen-Scott South Pole Station.

Outstanding Achievements Earn 28 Employees 1962 R&D Awards

(Continued from page 1)

ments of closely comparable stature.

In 1961, when the Army R&D Achievement Awards Program was initiated, 22 awards were made, recognizing 27 individuals—but the selectees were representative of outstanding accomplishments over a 5-year period.

Lt Gen Arthur G. Trudeau, Chief of Research and Development, will present awards to winners in the Washington, D.C., area at a ceremony in the Pentagon this month. The definite date had not been announced at press time. Chiefs of the Technical Services will arrange for presentation of the other awards in the name of General Trudeau. Names of all winners will be announced at the Army Science Conference, June 20-22, at the United States Military Academy.

Two of the Army's major R&D installations won three awards each, namely the Ballistic Research Laboratories, Aberdeen Proving Ground, Md., and the Signal Research and Development Laboratory, Fort Monmouth, N.J. Picatinny Arsenal, Dover, N.J., came in for two awards.

Basic to the selection of the award winners was the criteria stipulation that an "achievement will be regarded as significant when it (1) establishes a scientific basis for subsequent technical improvement of military importance, and/or (2) materially improves the Army's technical capability, and/or (3) contributes materially to national welfare.

In the category of contributing to national welfare, aside from defense requirements, a number of 1962 award achievements may have wide application to civilian requirements. Notably significant are fuel cells studies, the development of an improved antigen for immunization of man against anthrax, progress in high strength and lightweight materials, applications of LASER principles, and investigations to minimize aviation crash injury.

Still other advances may not have such obvious byproducts for civilian community needs, since military security requirements presently prevent discussion of their potential. Progress in missiles research, exploration and habitation of the far polar regions, and studies of air blast as a damage mechanism are important gains.

The four judges, all scientists assigned to the U.S. Army Research Office, are: Dr. Richard A. Weiss, Deputy and Scientific Director; Dr. Lester W. Trueblood, Chief of the Tropical and Desert Branch, Earth Sciences Division; Dr. Herbert L. Ley, Jr., Chief of the Medical and Biological Sciences Branch, Life Sciences Division; and Dr. Robert B. Watson, Chief of the Physics and Engineering Branch, Physical Sciences Division.

Award winners and brief descriptions of achievements for which they gained recognition are as follows:

FRANCIS P. McCOURT, U.S. Army Transportation Research Command, Fort Eustis, Va. Made a thorough study of Army aircraft accidents and established a program in aviation crash injury research. . . . Through his efforts, the importance of safety as a measure of genuine economy is a recognized fact, and crash worthiness is recognized as important in aircraft design as airworthiness.

HERBERT F. HUNGER, U.S. Army Signal R&D Laboratory. Recognized as one of the Army's foremost experts on fuel cells . . . determined that methanol would be the best liquid fuel and suggested using acid electrolyte to eliminate the need for regenerating or replacing electrolyte . . . patented use of ion exchange membranes and other fuel cell improvements . . . internationally recognized authority in this field.

MILTON PUZISS, Biological Laboratories, Fort Detrick, Md. Developed improved process for preparation of antigen for immunization of man against anthrax found more than 92 percent effective in extended study. This was the anaerobici process for production of anthrax protective antigen which materially improves the Army's technical capability and contributes to national welfare.

LUDWIG A. STERNBERGER, Army Chemical R&D Laboratories, Army Chemical Center, Md. Designed method which demonstrated by electron density the chemical nature of macromolecules dimensions. Produced antibody 80 to 100 percent pure with up to 33 percent of its total weight uranium, enabling analysis of chemical nature of single molecules. Introduced new kind of lethal chemical agent which affects different biologic system than existing agents.

GEORGE Q. CLARK, Army Missile Support Agency, White Sands Missile Range, N. Mex. Principal investigator in development of temperature sensing system for small rockets used for exploration of the upper atmosphere. Developed sensor which can measure temperature within and at 200,000 feet. Through his efforts, the gamma nosecone instrumentation system has been developed.

ROBERT C. BENSON, 2d Lt Robert O. Godwin (first Army officer to share in a team effort R&D Achievement Award), Michael R. Mirachi and John H. Smith, U.S. Army Signal

Emil J. York and Dr. Robert S. Wiseman are shown holding winners' plaques presented at the 1962 Director's Technological Achievement and Leadership awards banquet, May 15, at the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va. York (second from left) was recognized for developing a solar reflecting camouflage coating for missiles. Dr. Wiseman (right), Chief, Warfare Division Branch, won the Leadership Award. Col John H. Kerkering (left), Director of the Labs and John Golden, Office of the Director of Defense Research and Engineering, presented the awards.

R&D Laboratory. Applying LASER principles to the military environment, these four individuals conceived and developed a unique system for distance measurement which has been demonstrated successfully. They have filed a patent for their discovery of a spinning mirror technique which concentrates LASER energy in a single short .1 microsecond pulse of 3 megawatts power and high Q required for distance measurement.

DR. FREDERICK KAUFMAN, Interior Ballistics Laboratories, Aberdeen Proving Ground, Md. Elucidated the mechanism of the decomposition of nitric and nitrous oxides by means of precise rate measurements over a wide temperature range. Discovered and explained the catalytic effect of halogens on the nitrous oxide decomposition reaction. Developed an accurate method for determining the concentration of certain reactive atomic and radical species based on the intensity of light emitted in some of their reactions. By this method he has obtained reliable rate constants for very vast and fundamental reactions which previously were very difficult to study. Has recently completed a study of reactions of OH radicals. . . . These techniques have been widely used in laboratories in this country and abroad; they have made possible an understanding of important reactions for which no quantitative rate date were previously available.

JOSEPH SPERRAZZA, Ballistic Research Laboratories, Aberdeen Proving Ground, Md. Developed theoretical and experimental bases of 6a air blast as a damage mechanism. Provided data and information essential for evaluation and optimization of blast type weapons. Work results in better assessment of vulnerability of aircraft and work on containers as guide to Air Force, Atomic Energy Commission and contractors in construction of nuclear reactor power plants. Extension of knowledge of wound ballistics has resultd in improved body armor development.

MORGAN C. SMITH, Ballistic Research Laboratories, APG, Md. Established scientific basis for evaluating vulnerability of all types of aerial threats. Such knowledge leads to selection of lightest, cheapest and most effective warheads to counter or neutralize threats. Work has led to selection of optimum warheads for surface-to-air missiles. Vulnerability-of-aircraft studies have resulted in passive defense measures to decrease vulnerability of aircraft and missiles. Considered one of the pioneers in this field, he is recognized as an authority.

DR. STANLEY KRONENBERG, U.S. Army Signal R&D Laboratory, Fort Monmouth, N.J. Proved feasibility of high resolution neutron spectrometry at extremely high flux by the invention of a neutron spectrometer capable of revealing the detailed neutron energy spectra of very short radiation bursts. The invention includes a neutron and gamma ray measurement system employing extremely rapid response secondary emission devices he invented. This work has included basic research on secondary emission processes occurring during the bombardment of materials by high-energy radiation.

ANTHONY GOGLIUCCI and Ralph A. Vecchio, Picatinny Arsenal, Dover, N.J. Developed the rocket sled projectile recovery of high-velocity artillery shells without damage. This problem has long plagued artillery shell designers, but the new technique catches the shell in the exact condition it is when it leaves the weapon. The method utilizes a foamed plastic recovery media which is carried in a container mounted on a rocket sled moving at nearly the same velocity as the project to be recovered. The Ordnance Corps considers the system a major technical accomplishment.

DR. WALTER W. WHARTON, Joseph W. Connaughton, Barry D. Allan, Edgar F. Croomes, Harvard Eng and John R. Cain, Jr., Army Ordnance Missile Command, Redstone, Ala. Work of this group resulted in discovery of a new monopropellant combination which has higher specific and density impulse than existing bipropellant packageable liquids. . . . Since monopropellants enable rocket designers to simplify design and the one discovered by these men has more energy than any current monopropellant, their work represents a significant breakthrough.

THOMAS E. DAVIDSON, Albert H. Reiner, David P. Kendall and Robert A. Patell, Watervliet Arsenal, Watervliet, N.Y. Developed a new method for the application of the autofrettage process for use in the design and manufacture of high-strength, lightweight gun tubes. The process eliminates the ultra-high pressures required in the conventional hydraulic method.

MAX ROSENBERG, Picatinny Arsenal, Dover, N.J. Employed as a supervisory mechanic engineer and Chief of the Nuclear Concepts and Systems Section of the Atomic Ammunition Development Laboratory, he was recognized for superior leadership, imagination, scientific knowledge and initiative. His capabilities contributed to advanced weapon system concepts, several of which are of a highly classified nature.

WILLIAM H. SCHUETTE and Ivan Z. Lantz, Diamond Ordnance Fuze Laboratories, Washington, D.C. Because of security restrictions, the work for which they are to receive an R&D Achievement Award is described only as "exceptional contributions in the area of scientific and technical intelligence."

Drs. Rioch, Sim Win Distinguished Service Awards

Distinguished Civilian Service Awards, the highest honor conferred on Department of Defense employees, were presented May 22 to Dr. David McK. Rioch and Dr. Van M. Sim for outstanding work in Army science.

Deputy Secretary of Defense Roswell L. Gilpatric presented a total of six CSAs, including awards to William H. Godel and Paul H. Riley of the Office of the Secretary of Defense, Dr. Norman H. Jasper of the Department of the Navy and Dr. Lawrence E. Lamb, Department of the Air Force.

Dr. Rioch, Director of the Division of Neuropsychiatry, Walter Reed Army Institute of Research, was a winner of a 1961 Army Research and Development Achievement Award for the same work that earned the Defense citation. He was recognized for his superior direction of an outstanding program of interdisciplinary research in all phases of neuropsychiatry.

Due to Dr. Rioch's leadership, new approaches to psychiatric treatment were adopted that materially increased the rate at which military patients were returnd to duty. Among other honors conferred on him for his work during the past two years are the Department of the Army Civilian Service Award and an award from the Association of Military Surgeons.

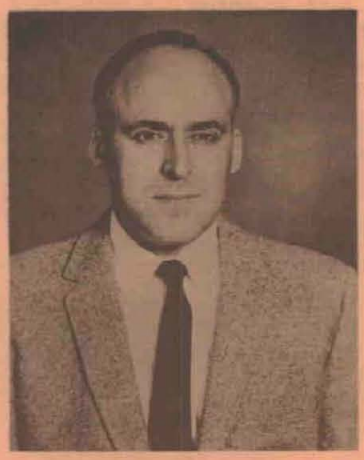
Born and raised in India, Dr. Rioch received his Ph.D. degree in medicine from Johns Hopkins University, Baltimore, Md., and taught at severall U.S. universities, including Harvard, before joining the Walter Reed staff in 1951.

DR. VAN H. SIM is Chief of the Clinical Research Division, U.S. Army Chemical Research and Development Laboratories, Army Chemical Center, Edgewood, Md. He was cited by the DOD for his direction of research on the effects of chemical agents, military chemicals, and therapeutic agents on men and animals.

In addition to exposing himself to new chemical agents, Dr. Sim has been responsible for a medical research volunteer program under which more than 400 men were exposed to potentially lethal and incapacitating chemical compounds without a single injury.

Graduated from the University of Washington and the St. Louis University School of Medicine, Dr. Sim is a native of Cashmere, Wash. During World War II he was a physician in the U.S. Navy, then became a Navy civilian employee, and has been employed by the Army since 1954.

Winners of 1962 Army R&D Technical Achievement Awards



Dr. Joseph Sperrazza
Ballistic Labs, APG, Md.

(Left to right) Michael R. Mirachi, 2nd Lt Robert O. Godwin, John A. Smith and Robert C. Benson, USASRDL, Fort Monmouth, N.J.

Max Rosenberg
Picatinny Arsenal, Dover

George Q. Clark
USASMSA, WSMR, N. M.

William H. Schuette
DOFL, Washington, D.C.

Ivan C. Lantz
DOFL, Washington, D.C.

(Left to right) David P. Kendall, Thomas E. Davidson, Robert A. Patell, Albert H. Reiner, Watervliet Arsenal, Watervliet, N.Y.

Dr. L. A. Sternberger
Army Chemical Center

Winners of 1962 Army R&D Achievement Awards

(For Information, see article on page 1)

Left to Right: Barry D. Allan, Joseph W. Connaughton, John R. Cain, Jr., Dr. Walter W. Wharton, Edgar F. Croomes, Harvard Eng—AOMC, Redstone, Ala.

Francis P. McCourt
TRECOM, Fort Eustis, Va.

Dr. Herbert F. Hunger
USASRDL
Fort Monmouth, N.J.

Ralph A. Vecchio
Picatinny Arsenal
Dover, N.J.

Anthony Gogliucci
Picatinny Arsenal
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Dr. Stanley Kronenberg
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Fort Monmouth, N.J.

Morgan G. Smith
Ballistic Labs, APG, Md.

Dr. Frederick Kaufman
Ballistic Labs, APG, Md.

Dr. Milton Puziss
Biological Lab
Fort Detrick