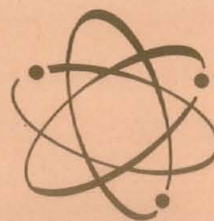




ARMY

RESEARCH AND DEVELOPMENT



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CDEC Planning Conference Of Commanders, Technical Directors on R&D Program

The First Commanders and Technical Directors Conference, an outgrowth of the reorganization of the Army, is scheduled May 1-3 at the U.S. Army Combat Developments Experimental Center, Fort Ord, Calif.

Under the joint sponsorship of the Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen and Chief of Research and Development Lt Gen Dwight E. Beach, the conference will broaden the scope of the former AKS parleys.

Army Key Scientists meetings, which had been held semiannually for eight years, were suspended last fall as a result of the merging of the materiel functions of the Technical Services in the new U.S. Army Materiel Command.

The new series of Commanders and Technical Directors Conferences is planned to bridge the communications gap resulting from that change. Moreover, the meetings will bring to-

(Continued on page 7)

Army Develops Broad Program Aimed at Improving Utilization of Scientific, Technical Information

An aggressive, intensively considered approach to a massively difficult problem is presented in a proposed Department of the Army Scientific and Technical Information Program required by a Defense Department instruction.

Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen approved the program late in January. It was then submitted to Dr. Harold Brown, Director of Defense Research and Engineering, for integration, along with proposals from other agencies, into the Department of Defense program.



Dr. Paul A. Siple
Takes State Department assignment in Australia. (See story on page 23.)

The Army STINFO Program is based on findings and recommendations of 23 task study groups. The tasks were assigned by an Army Ad Hoc Group on Scientific and Technical Information, established in April 1962 by direction of Chief of Research and Development Lt Gen Dwight Beach.

As approved by Dr. Larsen, the program would establish an Office of the Army Directorate of Technical Information under the Chief of Research and Development. The Ad Hoc Group recommendation is that the CRD assign the office to the Director of Army Research, and that it be located at Headquarters, U.S. Army Research Office, Arlington, Va.

Discussions of the problem of preparing an Army STINFO Program were considered by some 50 well recognized scientists, managers and technical information leaders at an orien-

(Continued on page 3)

Dr. Weber Accepts Bid to Head JSHS Advisory Unit

Dr. Ernst Weber is the new Chairman of the Advisory Council of the U.S. Army Junior Science and Humanities Program, directed toward building the interest of the Nation's high school students in scientific careers, preferably in Government.

Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen announced Jan. 31 that the President of the Polytechnic Institute of Brooklyn, N.Y., had accepted an invitation extended to him several weeks earlier.

The position has been vacant since the death of Dr. Conrad Elvehjem, who had served the Council for two years, in July 1962. Then President of the University of Wisconsin, he was noted as both an educator and scientist.

Selection of Dr. Weber, former President of the American Association for the Advancement of Science and an internationally renowned engineer, comes at a time when the Army is arranging for the First Na-



Dr. Ernst Weber

tional Junior Science and Humanities Symposium.

The meeting is scheduled at the United States Military Academy, West Point, N.Y., Apr. 3-5, and is expected to attract 150 or more of the

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Sending: An SOS for Society of Solid 'Squares'

As inserted into the *Congressional Record* by Representative Schadeberg of Wisconsin, the *Washington Star* recently published remarks on "The Return of the Square" excerpted from a speech by Charles H. Brower, President of the advertising firm of Batten, Barton, Durstine & Osborne, as follows:

Back in Mark Twain's day, one of the finest words in our language was "square." You gave a man a square deal if you were honest. And you gave him a square meal when he was hungry. You stood foursquare for the right, as you saw it, and square against everything else. When you got out of debt, you were square with the world. And that was when you could look your fellow man square in the eye.

Then a lot of strange characters got hold of this honest, wholesome word, bent it all out of shape and gave it back to our children. Convicts gave it the first twist. To them a square was an inmate who would not conform to the convict code. From the prisons it was flashed across the country on the marijuana circuit of the bopsters and hipsters. Now everyone knows what a square is. He is the man who never learned to get away with wrongdoing. A Joe who volunteers when he doesn't have to. A guy who gets his kicks from trying to do some thing better than anyone else can. A boob who gets so lost in his work that he has to be reminded to go home. A fellow who laughs with his belly instead of his upper lip. A slob who still gets choked up when the band plays "America the Beautiful."

His tribe isn't thriving too well in the current climate. He doesn't fit too neatly into the current group of angle players, corner cutters, sharpshooters and goof-offs. He doesn't believe in opening all the packages before Christmas. He doesn't want to fly now and pay later. He's burdened down with old-fashioned ideas of honesty, loyalty, courage and thrift. And he may already be on his way to extinction.

He and all the rest of us are living in a country today that is quite different from the one that we were taught to love. Parents have successfully defended in court their children's right to ignore the flag salute. Faculties and student bodies have found it distasteful to publicly take an oath of loyalty to their country. And the United States Military Academy has found it necessary to place a sign beside its parade grounds at West Point reminding spectators that it is customary for men to remove their hats at the passing of the banner that was once unashamedly referred to as "Old Glory."

What has happened? I think we have changed from an exporting country to an importing country.

I do not mean that we have let the world drain all of our gold away, although that is bad enough. I do not mean any imbalance of trade, as threatening as that may be. I mean that we have been importing, instead of exporting, ideas.

The United States of America was once the greatest exporter of ideas the world had ever known. We created and sold abroad the idea of individual dignity, responsibility and freedom. We created and sold the idea of government of the people, by the people and for the people—an idea that is still being bought today. We exported the idea of freedom of worship . . . the idea of an unfettered press . . . the idea that those who are taxed should be represented.

It is hard to find a basic idea that America has recently exported. We have bought in the bazaars of Asia Minor the idea that an honest man is either a fool or a liar. For our most mortal enemy we have bought the idea of a strong government for weak people. We have bought abroad the ideas of "Let George do it"—or "What's in it for me?"—and the gesture of the neatly shrugged shoulder.

But, most significant of all, most of us have been gullible patrons of the export firm of Sigmund Freud, who has sold us the idea that all men are born feeble, that we should abandon our ancient disciplines as too stark for the poor souls that we are, and seek our salvation through group support. Freud's discovery that man was not adjusted to his world, and could never be truly adjusted, seemingly justified the lazy cynic and condemned the square. For if you can't win, what is the use of trying? And here was the first great authority who said, "You cannot win."

This country was discovered, put together, fought for and saved by squares. It is easy to prove that Nathan Hale, Patrick Henry, Paul Revere, George Washington, Benjamin Franklin and almost anyone else you care to include among our national heroes were squares. This can be proven by simply thinking what they might have said had they not been squares.

Nathan Hale: Me spy on those British. Are you trying to be funny? Do you know what they do with the spies they catch? I'll give you a news flash, chum. They hang them.

(Continued on page 28)

Army Develops Broad Program Aimed at Improving Use of Tech Information

(Continued from page 1)

tation conference, Oct. 1-3, at Headquarters of the U.S. Army Research Office. Reports of task groups and a special high level steering group were consolidated by Dec. 17 in a program document several inches thick.

Activities of the Army Directorate of Technical Information, as set forth in the proposed plan, would be carried on in consonance with overall DoD program objectives established by Walter M. Carlson, newly appointed Director of Technical Information assigned to Dr. Brown's staff.

Actions to be taken in development of an integrated DoD program include:

- Steps to improve the acquisition, storage, retrieval and secondary distribution of DoD technical documents by the Armed Services Technical Information Agency (ASTIA).

- Improvement in the development and acquisition of technical reporting and providing ASTIA with technical reports.

- Completion of inventory and analysis of scientific and technical information activities of the Military Departments and the Advanced Research Projects Agency (ARPA).

As finally submitted the Army STINFO Program proposal is less expansive in scope, initially, than envisioned in early discussions of the Ad Hoc Group. The explanation is:

"Those recommendations which will require further study to determine their desirability, feasibility or methodology are not represented in this program document."

The Ad Hoc Group made a survey of about 90 Army installations and activities in November 1962. In the limited time available, and because of differences in reporting procedures, it was not possible to establish satisfactorily the nature and extent of STINFO activities and the funds committed. Continuation of the study is projected early in 1963.

As proposed, the Army STINFO Program is divided into three main projects: program support, exploratory development, and research. Further task studies will be made, employing talents not only of Army experts but also recruited consultants from business and academic worlds.

The Program is designed to "achieve a centrally coordinated, de-centrally operated Army scientific and technical information network," utilizing and integrating the effects of existing activities. The need for new

facilities or modification of present facilities is to be considered with respect to overall Army requirements.

An early objective is the development of a standard abstract format to be used by all Army agencies concerned with preparing scientific information. To achieve this goal, consultation with representative scientific and technical activities outside the Government also is suggested.

A change in the forms used for submission of information consolidated in the Army Research Task Summary (ARTS), normally an 8-volume annual publication of some 3,000 pages of highly condensed reports on the status of research tasks, also is contemplated. The new form will require additional information and will be more suitable for mechanization and eventual automation of data to keep it on a much more timely basis.

Recognized by the drafters of the Army STINFO Program is the necessity of instituting a broad training program to develop the various types of specialists needed to implement many of the proposed activities. Management of their careers to provide for incentives through promotion, recognition, prestige and progressive broadening of responsibilities is a part of the plan.

Development of machine language techniques for the exchange of information by the most rapid and efficient means is a fundamental objective. As stated in the proposal, "this will involve programing of computers to handle multiple or open indexing vocabularies, as well as other techniques for transmission of information."

Termed of "unique significance in the STINFO Program" is the use of a chemical structure information sys-

tem employing the "chemical typewriter" developed at the Walter Reed Army Institute of Research in Washington, D.C. (For description of this system, see May 1962 issue.) The system is expected to have wide application to chemistry in many fields and for the quick retrieval of information on chemical compounds.

The program calls for development of a "technical effort locator system" which is considered potentially of great value. It is intended to identify sources of special competence and information in all research and development areas, and to provide data on user needs and interests that are needed to solve problems of selective primary distribution and dissemination of technical information.

Planners of the STINFO Program anticipate that, in meeting the challenge of more effectively using the greatly expanding production of scientific and technical information, many new techniques and ideas will be essential. Research to discover new methodology is, therefore, basic to the program. Proposed areas of study include input-output devices, transmission systems, and networks.

The STINFO Program proposal includes a concise history of the Army role in development of techniques of collecting and disseminating information, dating back to 1880 when Col John S. Billings, Office of the Surgeon General, War Department, is quoted as saying:

"There is a need for some mechanical device for facilitating the compilation of population and similar statistics on a small card or slip by punching small holes in it. These would be sorted and tabulated by a counting device."

Frankford Arsenal Opens Army Measurement Center

The Army Metrology and Calibration Center was activated recently at Frankford Arsenal, Philadelphia, Pa., under authority from the U.S. Army Materiel Command.

The main mission of the Center is to implement new Army policy directives reflecting an integrated Army calibration and measurement program on a worldwide basis. Central technical direction is intended to assure the accuracy and compatibility of test and measuring equipment used throughout the Army.

Headquarters and laboratories of the Center are at 238 East Wyoming Ave., Philadelphia, in facilities for-

merly occupied by the Gage Laboratory of Frankford Arsenal.

Approximately 90 engineers, physicists and technicians work under the direction of M. L. Fruechtenicht. The Calibration Laboratory Division is headed by Anthony Bruno, the Calibration Engineering Division by Cyril B. Keane, and the Calibration Operations Division by Frank Marko.

On a broad scale, the new Center acts as the focal point in the Army for contacts with the National Bureau of Standards, other Military Services, industry, technical societies, and within the Army's own activities related to metrology and calibration.

National Referral Center for Science, Technology Cites Aims

In the rapidly mushrooming complex of agencies being established to deal with the high priority and complicated problem of improving utilization of scientific and technical information, the new National Referral Center for Science and Technology expects to be a "catalytic agent."

Scheduled to go on a limited operational basis in March, as announced by Director John F. Stearns, the Center is established as a division of the Library of Congress supported by the National Science Foundation.

Authorized a total staff of 28 specialists in scientific information problems, the Center had only 13 employees "on board" at the time a representative of this publication interviewed Mr. Stearns. Difficulties of recruiting the highly specialized type of personnel desired are expected to extend the problem of staffing over a period of several months.

Similarly, the envisioned scope of operations—that of collecting, indexing, listing and identifying availability of information requested in the nearest geographical location to achieve rapid response—is expected to require at least a year before the Center is fully operational.

"Our concept of operations," Mr. Stearns explained, "is to function as a clearinghouse in providing comprehensive, coordinated access to the Nation's resources of scientific and technical information."

Queried about the magnitude of that objective as he sees it, the former Deputy Director of the Armed Services Technical Information Agency (1958-1961) said a preliminary survey indicates there may be more than 100,000 potential sources of scientific and technical information with which the Center will be concerned.

Located in the Library of Congress Annex at Pennsylvania Avenue and Second Street, S.E., Washington, D.C., the Center is currently sending out thousands of letters of inquiry to determine specifically what types of information, and in what form, may be obtained from the resources.

As stated by Mr. Stearns, the Center will be concerned with libraries, information centers, publications, specialized bibliographic and data service, and the activities of Federal Government agencies, industry and even foreign nations in the technical information field. Responsibility will extend into four major areas:

- Identification of all significant information resources in the fields of

Mr. Stearns entered the technical information field through newspaper work (1933-1943) and magazine editing (1946-1948). He began his Government service in the Library of Congress, where he served as Chief of the Air Studies Division (1948-1951) and Chief of the Aeronautics Division (1951-1952).

From 1952 to 1958, he served in various capacities in the Technical Information and Intelligence Division of the Air Research and Development Command, USAF. He was Deputy Director of the Armed Services Technical Information Agency from 1958-1961, and Deputy Director of the Office of Scientific and Technical Information, National Aeronautics and Space Administration, from 1961 until his present assignment.

science and technology.

- Acquisition, cataloging and correlation of substantive and procedural data defining the nature, scope and capabilities of these resources.

- Provision of advice and guidance about these resources to any activity or individual requiring access to them, in terms that will permit the most effective satisfaction of the requirement.

- Exploration, through actual operating experience, of the roles and relationships that exist or that should

U.S. Army Helicopter Pilots Make First South Pole Landing

The first landing of a helicopter at the South Pole was made Feb. 4 by three U.S. Army Iroquois (UH-1B) aircraft from the U.S. Army Transportation Board, Fort Eustis, Va. News of the historic flight came as this issue went to press.

The Board is a field agency of the Army Test and Evaluation Command, Aberdeen Proving Ground, Md., an element of the U.S. Army Materiel Command.

The flight team consisted by Capt Frank H. Radspinner, Capt Neal B. Earley and 1st Lt. Charles W. Beaman. They flew 182 miles from 9,900-foot Mount Weaver to Amundsen-Scott Station the U.S. camp established during the International Geophysical Year. The temperature at the South Pole when they landed was 29 below zero.

The flight, to be described in more detail in the March issue of the *News-magazine*, was made as part of a Navy-led U.S. Geological Survey project concerned with charting a vast expanse of the Antarctic.



JOHN F. STEARNS, CHIEF

exist among the many facets of the scientific and technical information complex.

In view of the recent major expansion of the scope of the Armed Services Technical Information Agency activities, a similarly greatly broadened effort within the Army research and development establishment, the creation of a new Director of Technical Information at Department of Defense level, and the planning of substantially increased effort in various other Federal agencies, Mr. Stearns was asked:

"How do you envision that the National Referral Center for Science and Technology will function without encroaching upon the functional responsibilities assigned to other agencies, particularly ASTIA?"

"It should be made clear at the outset that the Center is not intended to provide specific scientific or technical information—only to advise the requester where it may be most readily available," Mr. Stearns explained.

"The Center will seek to establish and maintain the closest possible working relationships with the actual information systems and services constituting its major referral points.

"Our purpose is to assist the established services — not compete with them. The Center is designed to, as I mentioned before, serve as a catalyst, a point of liaison, in making known to the requester where he may obtain the information desired.

"However, our policy in making referrals will be to limit our service within guidelines drawn by each of the information systems or activities. That is, we will not refer a request for information except when the agency concerned can respond."

In no case, it was explained, will the Center attempt to provide direct and specific answers to factual scientific or technical inquiries.

Upon receipt of an inquiry, the Center will suggest where the information is available and leave it to the requester to approach the referral source. When the occasion demands, however, several variations in this normal practice may be used to speed or improve service.

General guidance is to be provided in published directories and guides, preparation of which will begin as soon as the survey of information resources is sufficiently advanced to meet initial requirements.

To facilitate response to inquiries, made by phone, letter or in person, the Center is recruiting a staff of scientists who preferably have had experience in scientific information dissemination. Most desirably, if not most practicably from the viewpoint of recruitment difficulties, applicants should be qualified in two or more scientific disciplines.

Considering that the grade range will be from GS-9 to GS-14, Mr. Stearns recognizes that attracting the highly qualified personnel needed may present problems. Optimistic about the Center's future and the probable growth of its staff to meet expanding functions, he believes that the pioneering stage of the Center presents both a challenge and an opportunity for career advancement in the rapidly

Mr. Hall first came to the Library of Congress in 1944 as an assistant in the Rare Book Division. Then he served in a variety of special project activities, including the Cooperative Acquisitions Project, the Science and Technology Project, and the Air Research Division.

In 1952 he left to become Assistant Director of Operations, Office of Technical Information, and later, Chief, Technical Information Division, Headquarters, Air Research and Development Command, U.S. Air Force.

In 1958 he returned to the Library of Congress as Assistant Chief, Air Information Division (now Aerospace Information Division) but left in 1961 to become Director, Technical Services Division, Office of Scientific and Technical Information, National Aeronautics and Space Administration. He has B.A. and M.A. degrees from Cornell University.

developing "science" of effective dissemination of scientific information.

Detailed from the National Science Foundation to the Library of Congress to direct establishment of the Center, Mr. Stearns until recently was Deputy Director of the Office of Scientific and Technical Information in the National Aeronautics and Space Administration.

Joseph E. Hall, Assistant Chief of the Center, formerly was Director of the Technical Services Division of NASA's Office of Scientific and Technical Information.

Other key staff members are



J. E. HALL, ASSISTANT CHIEF

Charles M. Gottschalk, formerly Chief of the Library of Congress Stack and Reader Division, assigned as Head of the Center's Systems Identification and Analysis Section, and Charles E. McCabe, Head of the Referral Services Section. Until recently Mr. McCabe was Chief of the Scientific Information Branch, U.S. Army Research Office.

AMS Sponsors Seminar On Space Mathematics

A Summer Seminar on Space Mathematics is scheduled at Cornell University, Ithaca, N.Y., July 1-Aug. 9. Sponsored by the American Mathematical Society, it will receive financial support from several Government agencies, including the U.S. Army Research Office-Durham, N.C.

As the third in a series of summer seminars on applied mathematics, the program will be a joint undertaking with the Summer Institute in Dynamical Astronomy.

The schedule provides for three 2-week courses of increasing sophistication. Opening courses will treat such basic material as practical astronomy and methods of orbit determination. These will be followed by topics stressing space activity.

The program lists lectures by such experts as Prof. S. F. Shen, Aerospace Engineering School, Cornell University; Prof. Simon Ostrach, Case Institute; Dr. Franklin Moore, Cornell Aeronautical Laboratory.

Attending part of the seminar is permitted, and participants from Government agencies may request waiver of the \$100 per week tuition.

Application blanks can be obtained from Prof. J. Barkley Rosser, Chairman, Joint Invitations and Organizing Committee, White Hall, Cornell University, Ithaca, N.Y. The deadline for application is Mar. 15.

AID Article Reports on 'R&D Looks to Seventies'

"R&D Looks to the Seventies" is the title of an article by Chief of Research and Development Lt Gen Dwight E. Beach in the February issue of the *Army Information Digest*.

Developing the theme of the "U. S. Army—1970," the publication presents articles on different facets of the Army's posture written by top military commanders, including Chief of Staff General Earle G. Wheeler and each of the Deputy Chiefs of Staff.

General Beach surveys the changes in hardware and tactics that have become integral in the Army since World War II. The geometric progression of research and development, he states, will result in even greater contrasts between today's equipment and that anticipated in 1970.

As he analyses each area of military materiel, he describes in detail the expectations of new or improved systems. Advance range from the simple yet vital factor of a molded sole combat boot to chemical and bio-

logical incapacitating weapons and defenses against such weapons.

The General explains how new concepts in military warfare, e.g., counterinsurgency, will be promoted by development of parallel combat systems like the Random Access Discrete Address (RADA) communications system, vertical take-off and landing (VTOL) aircraft and fuel cell engines.

In summary General Beach stresses two points: "First, Army R&D is using and will continue to use every means at its disposal to develop for the American soldier the most modern materiel and equipment that can be produced. And second, while we are utilizing modern science and technology to its maximum to develop new weapons and equipment, we are constantly keeping in mind that the ultimate weapon and the ultimate machine is MAN. We develop in order to enhance the combat capability of the individual soldier, not the machine."

Noted Biophysicist Heads Additions To Army Research Office Staff

Dr. Edward J. Baldes, noted biophysicist, is among recent staff additions to the U.S. Army Research Office (USARO), Arlington, Va. He will serve in the Scientific Analysis Branch, Life Sciences Division.

Associated with the Mayo Clinic, Rochester, Minn., since 1924, he was most recently Senior Consultant, Section of Biophysics. Previously he was Director, Division of Physical and Biophysical Research (1948-58).

In addition to his clinical duties, Dr. Baldes has been a professor of biophysics for the past two decades at the Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota, and vice chairman of the Mayo Aeromedical Unit. He also has served as a special civilian consultant to the Aeromedical Laboratory, Wright-Patterson Air Force Base (1942-49).

Dr. Baldes holds three degrees in physics, a B.A. from the University of Saskatchewan (1918) and an M.A. and Ph. D. from Harvard University (1920 and 1924). He also earned a Ph. D. in physiology from University College, London, England (1936).

Among the numerous boards and advisory councils of which he is a member are the Advisory Panel on Science and Technology to the Committee on Science and Astronautics, House of Representatives; and Aerospace Medical Panel, Advisory Group for Aeronautical Research and Development of the North Atlantic Treaty Organization.

For his design of special centrifugal devices which contributed to the safety of American aviators in World War II, he was awarded the War Department Commendation for Exceptional Civilian Service in 1945 and the Presidential Citation in 1948. Other honors include the French Legion of Honor (1951) and an honorary LL.D. from the University of Saskatchewan (1955).

Author of more than 150 scientific papers in the fields of biophysics, physiology and aviation medicine, Dr. Baldes is an active member of a dozen scientific societies.

DR. LEONARD E. WOOD has joined the Physical Sciences Branch, Environmental Sciences Division, as a geologist. He holds three degrees in geology, a B.S. and M.S. from the University of Kentucky (1951 and 1955) and a Ph. D. from Michigan State University (1958).

Prior to joining USARO, he served as geologist in charge of exploration



Dr. Edward J. Baldes

Dr. Leonard E. Wood

Walter L. Galson



Lt Col Henry S. Salmon, Jr.

Maj Wm. B. Ledbetter

Maj Frank L. Taylor

for bentonite in northeastern Mississippi with the Intern Mineral and Chemicals Corp., Chicago, Ill.; as surface geologist in the Quebec-Labrador Iron district with the Wabush Iron Co., Montreal, Canada; with the Military Geology Branch of the Geological Survey; and as a geologist in West Texas, Venezuela, and the Libyan Desert with Mobil Oil Co., New York City.

In 1956 Dr. Wood received a fellowship grant from the Federal Fish and Wildlife Service, Ann Arbor, Mich., to do research on bottom sediments of Saginaw Bay. He is a member of the American Association of Petroleum Geologists, the Geological Society of America, and the Society of Economic Paleontologists and Mineralogists.

LT COL HENRY S. SALMON, JR., new Chief of the Human Resources Research Branch, Human Factors Division, came from an assignment as Battalion Commander in the 31st Artillery, 1st Cavalry Division.

After earning a B.S.E. in education at Arkansas State College in 1941, he served during World War II in the Southwest Pacific area with the 98th Chemical Mortar Battalion.

Other assignments include: Instructor, Armored School, Fort Knox,

Ky., and AA&GM School, Fort Bliss, Tex.; Test Officer, U.S. Army Arctic Test Board, Fort Greely, Alaska; and Liaison Officer to Industry in Southern California, assigned to Materiel Developments Section, USCONARC, where he monitored Nike Zeus, Redeye and Mauler projects.

MAJ WILLIAM B. LEDBETTER has joined the Life Sciences Division as R&D Coordinating Staff Officer, Medical and Biological Sciences Branch.

Previously he was Chief, Military Personnel, U.S. Army Tripler General Hospital, Hawaii. He served from 1946-49 in Germany and Italy with various field medical units, including nine months in Berlin during the blockade of 1948-49. Later, in Korea, he won the Bronze Star for service with the 2nd Medical Battalion, 2nd Infantry Division.

Other assignments include Assistant Chief, Personnel Division, Surgeon's Officer, Hq., Fourth U.S. Army, Fort Sam Houston; and Personnel Officer, Walter Reed Army Medical Center, Washington, D.C.

MAJ FRANK L. TAYLOR has been assigned to the Operations Research Branch, Research Planning Division. Formerly he was stationed in Ger-

many as Regimental S-3 with the 14th Armored Cavalry.

A 1947 graduate of the U.S. Military Academy, he served in Korea with the 8th Cavalry Regiment, 1st Cavalry Division, and later on the staff and faculty of the Command and General Staff College, Fort Leavenworth, Kans.

While assigned to the Combat Vehicle Section of the U.S. Army Armor Board, Fort Knox, Ky., he was project officer for the M60 tank prototypes, M103 HV tank and dry-type air cleaner for tracked vehicles.

Among his decorations are the Bronze Star Medal and the Republic of Korea Presidential Unit Citation.

WALTER L. GALSON has joined the staff of the Research Support Division as scientific information administrator. For the past two years he had been a technical publications writer and editor at the Nuclear Power Field Office, Fort Belvoir, Va.

Born in Nuremberg, Germany, he came to the United States as a young man and prior to World War II enlisted in the U.S. Army. He served with the 87th Mountain Infantry Regiment in the Aleutian Islands campaign and in the Italian Theater of Operations, receiving the Silver Star, Bronze Star Medal, Purple Heart and British Military Medal.

Following the war, he earned B.A. and M.A. degrees in political science from the University of Michigan, and did postgraduate work in international relations at the London School of Economics. From 1952-60 he worked as a cartographer and military intelligence research specialist with the U.S. Army Map Service and Beach Erosion Board, Corps of Engineers.

Dr. Weber Accepts Bid to Head JSHS Advisory Unit

(Continued from page 1)

Nation's brightest young science students. Outstanding high school science teachers also will participate.

The U.S. Army JSHS Program was started by the Office of Ordnance Research in 1958, since redesignated the U.S. Army Research Office, Durham, N.C. The Program is administered now by the U.S. Army Research Office, Arlington, Va., through the Durham office.

DR. WEBER, a naturalized American, was born in Vienna, Austria, where he received his Ph. D. in physics. Prior to joining the Polytechnic Institute of Brooklyn in 1930 as visiting professor, he was a research engineer with the Siemens-Schuckert-Werke, in Austria from 1924 to 1929

CDEC to Host Commanders, Tech Directors Meeting

(Continued from page 1)

gether the laboratory directors and the commanding officers of Army R&D activities to discuss problems.

Presumably, the change will largely overcome one of the recognized weaknesses of the AKS meetings—that of expeditious command action on major recommendations.

Invitations will be sent to all Army research and development laboratories, the U.S. Army Materiel Command and to appropriate commodity commands.

The dual theme of the meeting is "Program Definition — Methods for Analysis and Assessment of Proposed System Development" and "The Health of In-House Laboratories — Implementation of the Gilpatric Memorandum."

Deputy Secretary of Defense Roswell L. Gilpatric directed, in a memorandum dated May 3, 1962, that action be taken to implement recommendations of the Bell Report, approved by President Kennedy on Apr. 30, 1962, with respect to Government research and development contracting.

Secretary of Defense Robert S. McNamara had issued a memorandum titled "In-House Laboratories" on Oct. 14, 1961, to "express my profound concern for the maintenance of a vigorous program and the highest morale within the laboratories throughout the Department of Defense." This document was a forerunner to many of the Bell Report recommendations.

Prepared at the request of Director of the Bureau of the Budget David Bell, the Report represented a

joint effort of top leaders in the Office of the Secretary of Defense, the Chairman of the Atomic Energy Commission, the Chairman of the U.S. Civil Service Commission, the Administrator of the National Aeronautics and Space Administration, and the Special Assistant to the President for Science and Technology.

Army Regulation 705-55, dated Oct. 11, 1962, subject: Research and Development of Materiel (Management of U.S. Army R&D Laboratories or Activities), clearly delineates the respective responsibilities of major commanders and laboratory technical directors to achieve the optimum environment in in-house R&D facilities. (See October 1962 issue, page 1 lead story, for complete information on provisions.)

In brief, AR 705-55 makes the Commanding General of the U.S. Army Materiel Command, The Surgeon General and the Chief of Engineers responsible, within the policy guidance of the Chief of Research and Development, for the implementation of policies pertaining to in-house laboratory management.

The Regulation requires that "mission statements and the specific responsibilities and authority of the commanding officer at each laboratory or activity will be defined in writing by the next higher echelon of command."

A part of the plan for the semi-annual Commanders and Technical Directors Conferences is that they will be augmented by informal monthly luncheon meetings of senior scientists of major Army R&D activities.

The conferences, like the luncheon meetings, are expected to provide a sounding board for airing of problems and exchange of information on significant progress of mutual interest. Unofficial planning and guidance for functions involving several R&D elements are among objectives.

Panel discussions at the Fort Ord conference are intended to give all participants an opportunity to express their views as pertinent to R&D activities and problem areas.

The tentative program includes a visit to the Stanford Research Institute, which conducts much of the research at the Combat Developments Experimentation Center, and the observation of a current task titled "Battalion Operations in a Toxic Environment" at the Hunter Liggett Military Reservation.

More than 90 representatives of Army R&D laboratories and command levels are expected to attend the conference.

Army R&D Office in Panama Picks Key Scientists



Dr. Delaney A. Dobbins

The U.S. Army Research and Development Office in Panama has announced appointment of Dr. Robert S. Hutton as Life Sciences Specialist and Dr. Delaney A. Dobbins as Behavioral Sciences Coordinator.

Under command of Col Robert T. Larson, the Office was established in

Maj Gen Welling Takes Over As South Atlantic Engineer

Maj Gen Alvin C. Welling, Deputy Commander for Site Activation, Ballistic Systems Division, Air Force Systems Command, Los Angeles, Calif., takes over this month as South Atlantic Division Engineer for the Army at Atlanta, Ga.

Known for his work on numerous Corps of Engineers major construction projects, General Welling succeeds Brig Gen H. A. Morris, who is assigned as Engineer for the U.S. Army, Europe.

General Welling will supervise the South Atlantic Division, consisting of the headquarters in Atlanta and district offices in Charleston, S.C., Wilmington, N.C., Savannah, Ga., Mobile, Ala., Jacksonville, Fla., and a new office being established in the Cape Canaveral, Fla., area.

Col George A. Finley, Post Engineer at Fort Knox, Ky., is to head the new district, which is expected to become operational by July 1.

The Canaveral District will be responsible for Air Force design and construction at Cape Canaveral and Patrick Air Force Base and, similarly, for the National Aeronautics and Space Administration at Cape Canaveral. Air Force work will include the \$37 million Titan III Launch Complex. The growing NASA program involves an estimated \$1 billion construction mission at Cape Canaveral over the next several years.



Dr. Robert S. Hutton

April 1962 to coordinate and supervise RDT&E activities in the humid tropics of Panama and vicinity.

Until 1959 Dr. Hutton served as a supervisory bacteriologist with the U.S. Army Biological Research Laboratories, Fort Detrick, Frederick, Md. As a biologist and bacteriologist, he started there in 1946 and later directed a program of research on processes for large-scale propagation and preservation of pathogenic and non-pathogenic and microorganisms.

Dr. Hutton holds a B.S. degree (1937) in physics and chemistry from South Dakota State College, and an M.S. (1940) in biochemistry and a Ph. D. (1947) in bacteriology from the University of Wisconsin.

A lieutenant colonel in the U.S.

Army Reserve, he served in Latin America during WW II and conducted an operation to train troops to be self-supporting in jungle areas.

DR. DOBBINS will coordinate the activities of human factors research teams studying effects of climatic variables on basic human skills, psychological warfare and civic action programs, compatibility of individual equipment items to the soldier in the tropics, and selection and training of personnel in tropical environments.

Since 1959, he has been a research psychologist with the U.S. Army Personnel Research Office (APRO). As leader of the Monitor Performance Task in APRO's Combat Systems Research Laboratory, he directed research in visual and auditory problems of man-machine systems, including vigilance, information processing and decision making.

A native of Lubbock, Tex., he holds a B.A. (1951) in sociology, an M.A. (1956) in general psychology and a Ph. D. (1959) in personnel and industrial psychology, all from Louisiana State University.

Prior to joining APRO he was Supervisor of Research in the Louisiana Department of Institutions, Baton Rouge, La., and worked as a management consultant for private industry in Tampa, Fla.

Listed in *American Men of Science*, he is a member of the American Psychological Association, Phi Kappa Phi, Pi Gamma Mu and Psi Chi, and has had numerous articles and conference papers published in professional publications.



U.S. ARMY AND PANAMANIAN SCIENTISTS who cooperated in Swamp Fox II shown at base camp headquarters in Chepo region of the Republic of Panama. Aimed at improving military transportation and communications capabilities in the tropics, the research project was conducted by the U.S. Army Transportation Board. (See September issue, page 10.) Left to right are Francisco Cornejo, Chief, Forestry Division, Servicio Interamericano De Cooperacion Agricola En Panama (SICAP); Lt Col Merle Dawson, Commanding Officer, Army Task Force Detachment No. 2; Alexander Tedesco, Chief, R&D Scientific Group; Steven Bosworth, Third Secretary, U.S. Embassy, Panama; Dr. Menalco Solis, Director, SICAP; Luis Othon, El Real, Republic of Panama; Dr. Leslie Holdridge, Consultant, R&D Scientific Group; Enrique Mayo, Ecologist, SICAP; Ricardo Gutierrez, Forester, SICAP.

Generals Waters, Conway Reassigned, Promoted



Lt Gen John K. Waters



Maj Gen Theodore J. Conway

Lt Gen John K. Waters assumed command of the U.S. Continental Army Command effective upon retirement of General Herbert B. Powell on Feb. 1 and has been nominated by President Kennedy for 4-star rank. He previously was Commanding General of the Fifth U.S. Army.

Appointment of Maj Gen Theodore J. Conway as Deputy Commanding General of the Eighth U.S. Army in Korea, effective upon retirement of Lt Gen Samuel Leslie Myers on Apr. 1, was announced by the White House at the same time.

Nominated for a third star, General Conway served in Korea immediately after concluding more than three years of service in the Office of the Chief of Research and Development. He was the first Director of Army Research and was relieved in March 1959 by the present Deputy Commander of the U.S. Army Materiel Command, Maj Gen William J. Ely.

LT GEN WATERS, a native of Baltimore, Md., was graduated from the U.S. Military Academy in 1931. During World War II he served as battalion commander and executive

officer with the 1st Armored Regiment in North Africa.

In recent years he has served as Chief, American Military Assistance Staff, Belgrade, Yugoslavia; Deputy Chief of Staff, Materiel Developments Section, USCONARC, Fort Monroe, Va.; Division Commander, 4th Armored Division, U.S. Army, Europe; and CG, V Corps, U.S. Army, Europe.

His decorations include the Distinguished Service Cross, the Distinguished Service Medal, Silver Star (2 OLC), Bronze Star Medal and Purple Heart (OLC). He also has been awarded high honors by the Governments of France and the United Kingdom.

MAJ GEN CONWAY graduated from the U.S. Military Academy in 1933. In addition to his assignment as Director of Research, OCRD, recent posts include Assistant Division Commander, 82nd Airborne Division; Senior Army Adviser, First Republic of Korea Army; Korean Military Advisory Group; and Plans Officer, Operations Division, Supreme Headquarters, Allied Powers, Europe.

During World War II he participated in the amphibious operations at Dieppe in France, Morocco, North Africa and Southern France. As G-3 of the Fifth Army he saw action in Italy and France.

General Conway's decorations include the Legion of Merit, Bronze Star Medal (2 OLC), and World War II high honors from the Governments of Great Britain, France, Italy, Poland and Czechoslovakia.

RAC Announces 4 Additions to Professional Staff

The Research Analysis Corporation of Bethesda, Md., a major Army operations research nonprofit agency, has announced addition of Donald J. Igo, Patrick J. Lynch, Dino G. Pappas and William Woodworth to the professional staff.

Economists Igo and Lynch are assigned to the Economics and Costing Division. Pappas and Woodworth are employed as operations analysts.

Mr. Igo is the author and coauthor of a number of reports on economic studies and has been employed during his career by the Rand Corporation, the Corvey Division of Melpar, Inc., the U.S. Bureau of Mines and the Central Intelligence Agency. Graduated from Harvard with a B.A. degree in economics, he received an M.A. degree from American University in Washington, D.C., and is studying there toward a doctorate.

MR. LYNCH until recently was instructor and assistant professor of economics at Saint Joseph's College in Indiana, and formerly was a research assistant to the Executive Department of the State of Indiana.

After receiving B.A. and M.S. degrees in economics from Saint Joseph's he continued study at Purdue University as a Fellow in 1961 and has since completed his Ph. D. work.

MR. PAPPAS served as intelligence research specialist with the Air Force prior to joining the RAC Conflict Analysis Division. In 1957 he served as a U.S. delegate to the International Geographical Union Regional Conference in Japan and later as geographer and publications editor with the Army Map Service. He has a B.A. degree in social sciences and an M.A. degree in geography from Ohio State University.

MR. WOODWORTH recently ended almost five years service as an international relations officer with the International Cooperation Agency, later redesignated the Agency for International Development. He has served as program planning officer in the Office of the Special Assistant for Mutual Security Coordination, and earlier held various NATO and governmental positions. He received his B.A. degree in social science from Columbia University.

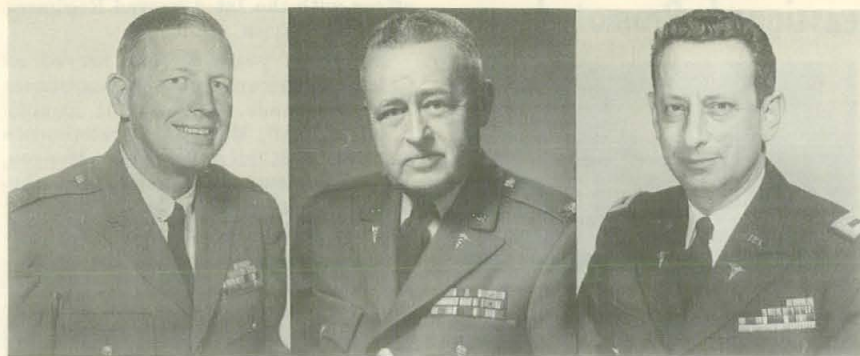
Loki-Dart Weather Rocket Opens 1963 Tests at WSMR

The Loki-Dart, a small weather rocket, led the 1963 parade into the White Sands Missile Range skies. For the first time in the last four years, the Army's Honest John failed to usher in the new year at WSMR.

Barely 40 inches in length, the Loki-Dart penetrates the ionosphere at the 50-mile level to chart the winds. It is fitted with a parachute-dropped container which holds either a radio transmitter or a bundle of metal "confetti."

When released from the Loki at a preselected altitude, the parachute device is tracked by radar to provide a means for computing wind velocity and other weather characteristics in firing of inter-continental missiles.

During the record-breaking test year of 1962, 2,615 "hot" tests were conducted at the WSMR by the Army, Navy and Air Force.



Col Conn Lewis Milburn, Jr. Col Bryan G. T. Fenton Col Joe M. Blumberg

President Nominates 3 Medics for General Rank

President Kennedy announced nomination of three U.S. Army Medical Service officers for promotion to brigadier general on Jan. 21.

All stationed in Washington, D.C., they are Col Joe M. Blumberg, Deputy Director of the Armed Forces Institute of Pathology, Bryan C. T. Fenton, Executive Director of the Office for Dependent's Medical Care, and Conn Lewis Milburn, Jr., Director and Commandant, Walter Reed Army Institute of Research.

Col Blumberg also is Chief Pathology and Laboratory Sciences Consultant to The Surgeon General. He served as Consultant in Pathology and Laboratory Medicine to the Chief Surgeon, Armed Forces Far East, prior to his current assignment.

Commissioned from ROTC at Emory University, Atlanta, Ga., where he received his B.S. degree in 1930, he went on active duty in 1941. During World War II he was Chief, Laboratory Service, 115th General Hospital in the European Theater, followed by duty with the Army Institute of Pathology.

Subsequently he served as Chief, Laboratory Service, Oliver General Hospital, Atlanta, Ga.; Chief Pathologist, and later Chief, Laboratory Services, Walter Reed Army Hospital; and Commanding Officer, 406th Medical General Laboratory, Far East Command, Japan.

In 1956 Col Blumberg served as Special Adviser to the Republic of Korea Army in Pathology and Laboratory and also as Special Adviser and Consultant to the Minister of Health, Philippines. Other special appointments and assignments have included membership on the Joint Committee on Aviation Pathology and Visiting Consultant to the Chief Surgeon, U.S. Army, Europe.

A Founding Fellow and member of

a long list of medical societies and professional organizations, he is president of the Washington Society of Pathologists, has lectured on such subjects as "Medicine in the U.S.S.R.," and "The Role of the American Registry of Pathology," and has authored many articles in medical journals.

His awards include the Hektoen Bronze Medal from the American Medical Association and the Stitt Award, presented at a recent meeting of Association of Military Surgeons.

COL FENTON served as Surgeon with the United Nations Command, U.S. Forces, Korea, until recently.

After receiving his B.S. and M.D. degrees from the University of Nebraska in 1932, he was commissioned a first lieutenant in the Army Medical Corps in 1935. In World War II, he served in the European Theater.

From April 1945 his assignments have included: Chief, Special Planning Division, Office of the Surgeon General; Assistant Director and Director, Training Doctrine, Army Medical Service School; Executive Officer, Medical Division, Hq., U.S. Army, Europe; Executive Officer, Office of the Surgeon General; and Commander of Martin Army Hospital, and Post Surgeon, Fort Benning, Ga.

After graduation from the Industrial College of the Armed Forces in 1954, he served as Chairman of the Armed Services Medical Material Standardization Committee while on duty with the Supply Division, Office of the Surgeon General.

Recognition for his administrative ability led to a special duty assignment in 1947-48 with the Hoover Commission on the Organization of the Executive Branch of the Government in preparing a report to Congress on the Federal Medical Services.

Col Fenton is a member of several professional medical societies, includ-

ing the Association of Military Surgeons of the United States. His decorations include the Legion of Merit, Bronze Star and Commendation Ribbon with two Oak-Leaf Clusters.

COL MILBURN served as Executive Officer and Director of Graduate Education, Walter Reed General Hospital, prior to his current assignment.

In World War II his assignments included: Chief, Communicable Disease Section, Gorgas Hospital, Panama Canal Zone; Chief, General Medical Service, Brooke General Hospital, Fort Sam Houston, Tex.; Assistant Surgeon, Armored Force, and later Surgeon, Armored Command, Fort Knox, Ky.; and Chief of Operations and Deputy Surgeon, Medical Section, 12th Army Group, Europe.

After the war, Col Milburn was appointed Commanding Officer and Director, Armored Force Medical Research Laboratory, Fort Knox. Later he became professor of military science and tactics, Western Reserve University School of Medicine.

Subsequent assignments include: Chief of Pediatric Service, Letterman General Hospital, San Francisco; Assistant Army Attache for Medical Research, American Embassy, London; and Surgeon, Military District of Washington.

A frequent contributor to leading medical journals, he is consulting editor to *Medical Annals of the District of Columbia*. His military decorations include the Legion of Merit and several foreign awards. Among his many degrees and certifications is master of public health, Royal College of Physicians and Royal College of Surgeons, England and Scotland.

Dr. Asher, Economic Analyst, Assumes DoD Programing Post

Dr. Harold Asher is newly installed as Deputy Assistant Secretary of Defense (Programing), Office of the Assistant Secretary of Defense (Comptroller).

Formerly manager of economic analysis with General Electric's Technical Military Planning Operation, Santa Barbara, Calif., he concurrently was employed as a guest lecturer in development of cost estimating techniques with Harbridge House, Inc., in Los Angeles.

A native of Chicago, Ill., he earned a B.A. degree from the University of Illinois and a Ph. D. from Ohio State University, where he taught economic statistics. He also has taught mathematics at the University of California at Santa Barbara, and was a Government employee as an analytical statistician with the Air Force Air Materiel Command, Dayton, Ohio, 1951-52.

TAG Letter Adds to Army Policy on ARPA Support

Additional policies for support of the Advanced Research Projects Agency (ARPA) are outlined in a new TAG letter prepared in the Research Programs Office of the U.S. Army Research Office.

Complementary to the basic guidance and policy for Army research contained in Army Regulation 705-5, the letter sharply curtails the sources to which ARPA orders may be addressed, to ensure closer control.

ARPA orders have been addressed to 15 different headquarters, laboratories and installations in the Army. The change in policy is intended to improve management, reduce the work load and facilitate the solution of coordination problems.

Under the change, ARPA orders are to be addressed only to the Chief of Research and Development, the commanding generals of the U.S.

Material Command Peps Up Value Engineering Program

The U.S. Army Materiel Command's Value Analysis Engineering Program, designed to provide the Army with the best equipment possible at the lowest possible cost, is receiving top level emphasis.

Results of a 3-day meeting, Feb. 6-8, at the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va., will be reported in the March issue of this publication.

Representatives from the Command's major field agencies and sub-agencies are expected to attend the meeting to exchange information on the current status of the program, to discuss problem areas, and to generate proposals for increasing the program's progress and effectiveness.

Maj Gen William J. Ely, Deputy Commanding General, Army Materiel Command, is scheduled for the keynote address.

Agencies expected to be represented include the Army Electronics Command, Fort Monmouth, N.J.; Army Missile Command, Redstone Arsenal, Ala.; Army Mobility Command, Center Line, Mich.; Army Munitions Command, Picatinny Arsenal, N.J.; Army Supply and Maintenance Command, Washington, D.C.; Army Weapons Command, Rock Island, Ill.; Army Logistics Management Center, Fort Lee, Va.; Army Quartermaster Research and Engineering Center, Natick, Mass.; Diamond Ordnance Fuze Laboratories, Washington, D.C., and the Ordnance Management Engineering Training Agency, Rock Island, Ill.

Army Materiel Command and the Combat Developments Command, The Surgeon General, Chief of Engineers, and U.S. Army Research Office-Durham, N.C. The letter states:

"The Army will give maximum and expeditious support to ARPA proposals and orders within existing resources of manpower and administrative capabilities. Army research, to include manpower and facility utilization, will not be degraded by preference for ARPA projects.

"Overall Army guidance, policy and procedures pertaining to ARPA research and support will be promulgated by the Office of the Chief of Research and Development. Technical and scientific matters for specific ARPA research may be the subject of direct contact between Army field re-

search and development activities and ARPA."

The Chief of Research and Development has the Army staff responsibility for establishing and maintaining an Army management point of contact with ARPA, and for establishing, coordinating and assuring implementation of policies for management and control of ARPA funds.

Additional CRD responsibilities with respect to ARPA include establishing technical points of contacts for matters of high priority, as required, and rendering reports to the Chief of Staff and the Secretary of the Army, as required.

The TAG letter states that "the unique funding procedure of ARPA requires particular care by all Army agencies to ensure that control of obligations and expenditures is maintained."

Army Completes Testing of Powerful Jeep Radio

Development and completion of testing of an ultra-rugged, lightweight jeep radio that greatly improves long-range combat communications between U.S. ground forces was announced by the Army on Jan. 31.

The 2-way transistorized set, called the "Angry-106," from its official designation AN/GRC-106, is the first Army jeep radio to provide dependable 50-mile voice communications even over severe terrain obstructions.

The 100-pound radio is half the size and weight of the set it replaces. Through use of advanced single sideband circuitry it provides 10 times the effective signal power, twice the range, and greatly improved clarity.

A high priority test and development program was completed in two years by the U.S. Army Electronics Research and Development Laboratory, Fort Monmouth, N.J., and its contractor, General Dynamics Electronics, Rochester, N.Y. That is half the time usually required for such a development.

In operation, the new radio provides initial long-distance communications when ground forces enter a new area, and enables a commander to maintain radio contact with widely dispersed forces in a fluid combat area while the jeep is in motion.

The new radio has been put through rigorous tests in simulated combat. It operated perfectly after two air-drops, more than 3,000 miles of road tests, and standard laboratory shock and vibration tests. In heat, dust and rain, it also proved superior to other sets of comparable size and weight.

Composed of two units mounted one atop the other, the set operates on

any one of 28,000 high frequency channels spaced one kilocycle apart. It nets with the Army's other high frequency sets and features a simple system of digital tuning in which a channel is selected by setting a series of knobs to prescribed numbers.

The unit is planned as the first of a family of lightweight long-range sets for Army tactical use to be manpacked or mounted on ground vehicles and combat aircraft.

The Angry-106 operates at 400 watts peak power in the 2 to 30 megacycle range and employs single sideband transmission to increase the effective power of its signal. An ordinary radio signal is composed of two "sideband" elements, each of which contains the same message, and a "carrier" element which uses most of the signal power and contains no message at all.



MIGHTY JEEP RADIO — "Angry-106," termed the first jeep set capable of spanning the globe, is used in combat for distances up to 50 miles.

Army Sets Up Foreign Science-Technology Center

Dissemination of timely information on foreign military developments to the Army and other Government agencies is the function of a newly established Army Foreign Science and Technology Center (FSTC).

Under the U.S. Army Materiel Command, the Center at Arlington Hall Station, Arlington, Va., is responsible for technical intelligence activities formerly conducted by the Chemical, Signal, Transportation, and Quartermaster Corps.

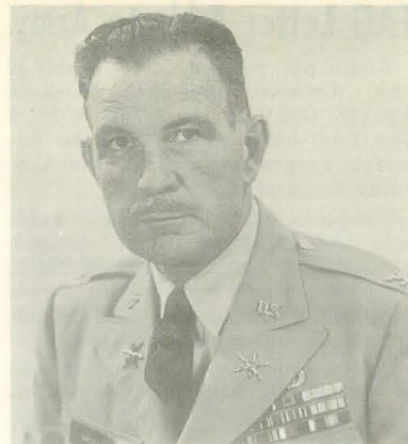
Col Harrison B. Harden, Jr., former Director, Guided Missile Department, U.S. Army Artillery and Missile School, Fort Sill, Okla., heads the FSTC.

The Center is charged with collecting, evaluating and supplying information on foreign equipment, sciences

and technologies of interest to the Army. It is particularly interested in uncovering superior foreign technologies in weapons and equipment for study by the Army.

Areas of interest include Army aircraft; atomic, biological and chemical agents; combat materiel; combat support systems; communications and electronics; general equipment; material exploitation; missiles and space; transportation equipment; weapon systems; environmental, physical and life sciences; and scientific resources.

A 1935 graduate of the U.S. Military Academy, Col Harden served as a battalion commander with the 82nd Airborne Division in WW II during operations in North Africa and Sicily. He later served with the 11th Airborne, Army of Occupation in Japan.



Col Harrison B. Harden, Jr.

Since the war, Col Harden has had a succession of assignments related to Army technical fields. He served as Department Executive and Instructor, Department of Combined Arms, The Artillery School, Fort Sill, from 1950 to 1953; as Chief, Organization and Equipment Division, G-3 Section, Hq., Seventh Army from 1953 to 1956; as Artillery Adviser and Combat Developments Staff Officer, U.S. Army Electronic Proving Grounds from 1956 to 1959; and as CO, 209th Artillery Group (Redstone), 1959-60.

Inventor at Fort Belvoir Wins Another Award

Theodoric B. Edwards, an engineer at the U.S. Army Mobility Command's Engineer Research and Development Laboratories, Fort Belvoir, Va., recently received another award for an invention on which he has applied for a patent.

Col J. H. Kerkerling, Commanding Officer, presented him with a certificate and an initial award of \$50 for the disclosure of his concept of an improved metadyne drive and control system for self-propelled vehicles.

In November 1962, Mr. Edwards received \$50 each in connection with his invention of an inflatable wheel pontoon, a field reversing switch for series motors, and a vehicle wheel suspension system. Under terms of the patent applications, the Government will have the right to manufacture and/or use the inventions without the payment of royalties.

The improved metadyne drive and control method is said to provide a system of great flexibility which is reliable, easy to operate, and has a very rapid rate of response for self-propelled track or wheeled vehicles such as tractors.

Edwards' inflatable pontoons are designed to provide a buoyant float and to steady an amphibious vehicle while crossing water. They consist of concentric telescoping sleeves fitted inside one another with the last, or smallest, sleeve being closed by a diaphragm across its end. Pressure applied internally, causes the sleeves to slide into an inflated position forming a rigid hollow, air-tight enclosure.

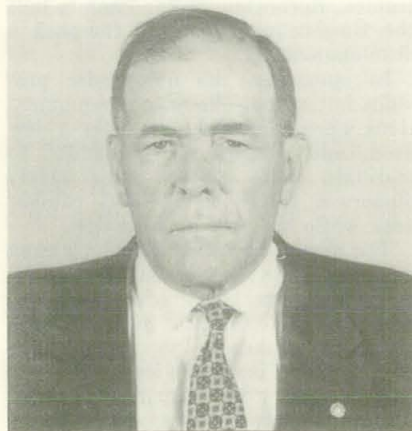
To collapse the pontoons, a vacuum

is applied, allowing atmospheric pressure to push the sleeves into a compact nest. Air is pumped into and exhausted from the pontoons through a hollow axle by a reversible vane-type rotary pump.

In addition to his inventions for which patents are pending, he has received patents for a self-contained vehicle heater, a remote controlled fire fighting turret and nozzle, a foam generator, and a foam nozzle.

A veteran of World War I and a 1924 graduate of the University of Virginia, he has been employed at the Laboratories since 1944.

A month ago he was elected president of the Fort Belvoir chapter of the Scientific Research Society of America.



Theodoric B. Edwards

CDC Extends Contract For Operations Studies

Military operations research and scientific studies in support of long-range planning for the U.S. Army Combat Developments Command will be conducted by the Combat Operations Research Group (CORG) under a recent \$700,000 contract.

The contract represents an extension of the scientific advisory work of CORG which since 1955 has operated under Technical Operations Research, Burlington, Mass. The studies will be conducted at Fort Belvoir, Va., USACDC Headquarters.

Dr. F. C. Henriques, President of Technical Operations Research, announced that CORG previously provided technical support for the U.S. Continental Army Command at Fort Monroe, Va. Director of the Group is Mr. Martin N. Chase, who has been associated with Technical Operations Research since 1956.

Comanded by Lt Gen John P. Daley, the USACDC became operational July 1, 1962, and is responsible for development of tactics, weapons, logistical and support systems for the Army of the future. (See November 1962 issue, page 15.)

EJC Sees 'Imbalance' in Federal R&D Spending

What the Engineers Joint Council (EJC) considers an "imbalance" in the allocation of research and development spending between defense and civilian requirements is to be referred to the attention of the Government.

In the Winter 1962 edition of *Engineer*, published in its behalf, the EJC expresses concern about "possible neglect of basic need-oriented engineering programs, particularly in the absence of review of the allocations by appropriate governmental agencies."

The EJC Board of Directors has assigned the task of suggesting corrective action on its findings to its Government Liaison Committee headed by Dr. William J. Harris, Jr.

EJC President Eric A. Walker is quoted as saying that engineers have "generally stood apart from the broad question of national policy in the past, with the result that the Nation may not have been well served."

The EJC Board of Directors report is titled "The Nation's Engineering Research Needs, 1965-1985." Extracts from the report as published in *Engineer*, follow:

"Science is the predominant factor that influences the allocation of national research and development funds. The large Federal programs of research and development are largely dedicated to the exploitation of new scientific opportunities. In the DoD and NASA budgets for research and development, major attention is given to devices that go deeper or higher or faster or farther or more accurately.

"The needs of people and society are not given sufficient attention in

the allocation of research and development funds. The non-defense agencies do not have research and development programs that relate broadly to their entire mission or that reflect the enormous impact of technology on the lives of people and on political and social organizations.

"The importance of maintaining a competitive technological position to contribute to growth of the national economy is not recognized in the current allocations for research and development. Civilian industry is expected to assure the growth of the civilian economy.

"The fragmentation of most industries has led to concentration on materials and devices with little re-

lationship to the technical and socio-economic systems within which these materials and devices must function.

"Only those industries that have large integrated responsibilities, and that have been organized in the last few decades in cooperation with the public interest, have developed effective systems that provide service to the general population.

"Increased attention should be given to systems studies on problems affecting economic growth and the welfare of the population in order to optimize the use of highly developed materials and device technologies."

The EJC is a private organization whose stated purpose is to advance the general welfare of mankind through the resources and creative abilities of the engineering profession.

AHFRAC Reviews Human Factors Research Program

Special Warfare and counterinsurgency requirements in limited emergency situations received consideration at a recent meeting of the Army Human Factors Research Advisory Committee (AHFRAC).

As the coordinating group for U.S. Army Research Office human factors work programs, AHFRAC examines periodically their applicability to Army current and anticipated needs.

Senior representatives from the Department of the Army, U.S. Continental Army Command, U.S. Army Materiel Command and U.S. Army Combat Developments Command serve on the AHFRAC.

Dr. T. R. Vallance, Director of the Special Operations Research Office (SORO) discussed problem areas of SORO as related to human factors and social science research, including:

- How to communicate effectively across cultural barriers.
- Determining how political and economic conflict within countries may be exploited or how such conflicts may be reduced.
- Describing and analyzing tactics of carrying on unconventional warfare, guerrilla fighting, and civil population riot control.

Other speakers included Dr. W. A. McClelland, Deputy Director, General Operations and Personnel, Human Resources Research Office (HumRRO). Dr. H. H. McFann, Deputy Director, Program Development, HumRRO, and Dr. J. E. Uhlener, Director of the Research Laboratory, U.S. Army Personnel Research Office (APRO) and Dr. H. E. Brogden, Chief Scientist, APRO.

Established by the Office, Chief of Research and Development, AHFRAC is chaired by Col George J. Bayerle, Jr., Chief, Human Factors Research Division, U.S. Army Research Office (USARO). The Executive Secretary is Lt Col Russell D. McGovern, Chief, Personnel and Training Research Branch, USARO.

AHFRAC membership consists of Col Raymond L. Cato, Office of Personnel Operations; Col William H. Pople, Office, Deputy Chief of Staff, Logistics (Lt Col Jack P. Ancker, alternate); Col Orrin A. Tracy, Office, Deputy Chief of Staff, Personnel (Lt Col John D. Murphy, alternate); Lt Col John F. Hyde, Office, Deputy Chief of Staff for Military Operations (R. K. Herz, alternate); Norman L. Klein, U.S. Army Materiel Command; Lt Col William A. Koenig, Combat Developments Command; Col David Cooper, Continental Army Command.

Special Warfare Insignia Symbolizes Role



Military personnel manning the U.S. Army Special Warfare Center, Fort Bragg, N.C., are authorized to wear a newly adopted shoulder sleeve insignia symbolical of their mission.

When the new patch is issued to troops and sold through post exchanges, it will replace the U.S. Continental Army Command insignia for SWC personnel.

A white lamp of knowledge representing the Center is on a black shield. Three red and yellow tongues of flame symbolize the areas of instruction (psychological operations, counterinsurgency and unconventional warfare). Yellow crossed arrows recall the silence and stealth of unconventional warfare. All are within a

1/8-inch yellow border. Total height of the patch is 3 and width is 2 1/2 inches.

Established in 1953, the U.S. Army Special Warfare Center is currently commanded by Maj Gen William P. Yarborough. Its mission is to turn out specially selected personnel qualified to fight a new kind of war.

As stated by President Kennedy, Special Warfare training emphasizes a need for "improvement and enlargement of our own development of techniques and tactics, communications and logistics" to meet the guerrilla tactics.

USARO-Durham Slates Operations Research Meet

Department of Defense, NATO and civilian institution leaders have accepted invitations to take part in the U.S. Army Operations Research Symposium at Duke University, Durham, N.C., Mar. 26-28. Sponsor of the meeting is the U.S. Army Research Office-Durham.

Senator B. Everett Jordan of North Carolina, Assistant Secretary of Defense (Comptroller) Charles J. Hitch and Dr. Hugh Miser, President of the Operations Research Society of America, are listed as speakers.

Commanding Generals who will emphasize the importance of operations research to their command functions include Lt Gen John P. Daley, U.S. Army Combat Developments Command, Lt Gen Frank S. Besson, Jr., U.S. Army Materiel Command, and Chief of Research and Development Lt Gen Dwight E. Beach.

Director of Army Research Maj Gen C. W. Clark will preside at a dinner honoring Senator Jordan. Assistant Director Col C. B. Hazeltine, Jr., former Chief of the Operations

Research Division, USARO, is also on the opening day program.

Other distinguished speakers listed on the agenda are Dr. R. M. Thrall, Professor of Research Mathematics, Institute of Science and Technology, University of Michigan; Dr. Russell Ackoff, Professor and Director of Operations Research Group, Case Institute of Technology; and Leslie C. Edie, Port of New York Authority.

Two panel discussions are scheduled, with Dr. Philip M. Morse of the Massachusetts Institute of Technol-

ogy and Dr. Merrill M. Flood of the University of Michigan presiding.

About 150 representatives of Army agencies are expected to attend the meeting, the objective of which is to emphasize the role of operations research in the improvement of military operations. Presentations will report on technological developments in operations research techniques and significant activities in progress.

Col George W. Taylor, former commander of the U.S. Army Research Office in Durham, and now affiliated with the Research Triangle Institute, will preside at the banquet.

RAC Plans Tripartite Operations Research Parley

Dr. Lynn Rumbaugh, Director of Combat Systems, for the Research Analysis Corporation (RAC), will be keynote speaker at the Eighth Biennial Tripartite Conference on Army Operations Research in Washington, D.C., June 17-29.

RAC, which will conduct the conference at the request of the U.S. Army Research Office, Office of the Chief of Research and Development, has announced that Dr. Rumbaugh's

topic is "A Review of the Accomplishment of Operations Research with Respect to Military Problems."

The conference emphasis will be shifted from technique and method discussions in previous years to the military areas of application of operations research.

The three main topics are directed to military problem areas. The United Kingdom and Canadian speakers will be announced at a later date. The topics and RAC speakers are:

Land/Air Combat between Major Forces—Dr. Philip H. Lowry, Chief of Weapons Systems Division, who will discuss "Theater Operations with Dual Capability Forces."

Limited War (including counterinsurgency) in Southeast Asia—Charles Warner, Director of RAC Southeast Asia Field Office, "Conflict in S.E. Asia: Role of Operations Research."

Allocation of Resources—Dr. Irving Siegle, Chief of Economics and Costing Division, "Problems of Strategic Posture and Readiness."

Conference delegates will attempt to reach a consensus in terms of the state-of-the-art regarding problems linked to the main topics, key problems to be solved, current work, and necessary and promising approaches.

RAC is a private, nonprofit corporation headquartered in suburban Washington, D.C., and reporting to the Chief of Research and Development. The corporation is responsible for most part of the Army operations research and system analysis.

RAC's basic objective is to back-stop Army planners and commanders by providing them with the best possible scientific and analytical advice—ideas, findings, recommendations, solutions—for major Army decisions.

President of RAC is Frank A. Parker, Jr., former Assistant Director of Defense Research and Engineering.

HumRRO Assigns Dr. Bialek as Program Adviser

Dr. Hilton M. Bialek is the new Adviser for Program Development in the Director's Office of the Human Resources Research Office (HumRRO), Washington, D.C.

Formerly the Senior Scientist with the Leadership Human Research Unit at the Presidio of Monterey, Calif., he served as task leader for Task QUIZ, a research study developing interpretation techniques for obtaining tactical information.

Dr. Bialek also has worked on Task FIGHTER which seeks to develop training procedures to enable combat soldiers to cope with physical stress. (See Vol. 4, No. 1, page 18.)

Duties of his new position include studying existing and future requirements to indicate areas where HumRRO research should be concentrated for greatest impact. He also will have a major role in coordinating HumRRO work with that of other human factor organizations to insure an integrated research effort.

A native of Passaic, N.J., Dr. Bialek holds a B.A. from Rutgers University (1950), an M.A. from Teachers College, Columbia University (1951), and a Ph. D. in psychology from the Claremont Graduate School.

Before joining HumRRO in 1957,

he held various positions in psychology, including psychometrist for the Veterans Administration in New Jersey and instructor at Pomona College, Claremont, Calif.

Author of numerous professional papers, he is a member of the American Psychological Association, the Western Psychological Association and the American Association for the Advancement of Science.



Dr. Hilton M. Bialek

President Orders Study on Federal Pay Adjustment

Since this publication carried an extensive report on Federal pay reforms (October 1962 issue), the editor has received a number of letters and telephone calls critical of various provisions of the plan.

One irate scientist termed the Pay Act Super-Imposed Scale "the biggest hoax ever perpetrated upon the Federal scientific community," and demanded that the editor "expose its deception." Other critics were milder — more disappointed than angry about alleged inequalities and oversights in the Pay Act.

A Civil Service Commission official, with whom some of the criticisms were discussed, conceded to certain inequalities and weaknesses in the Pay Act reforms. He emphasized,

however, that the Act represented penetrating consideration of the problem by dedicated and competent leaders, and that further studies would be made to adjust deficiencies insofar as practicable.

On Jan. 31 President Kennedy backed up that assurance by asking the Advisory Panel on Federal Pay Systems to continue studies on salary levels for top positions in the legislative, executive and judicial branches of the Federal Government.

The Panel is headed by Clarence B. Randall, former President of Inland Steel Co. Two newly appointed members are Robert Ramspeck, former Democratic Representative in Congress from Georgia, and Stanley Reed, retired Associate Justice of the

Supreme Court.

President Kennedy, according to a White House statement, has "stressed the importance of completing the partial adjustment in top career salaries made last year . . . and of providing a rational relationship between top career and executive salaries."

Maj Gen Cassidy Assigned To Head Engineer Center



Maj Gen William F. Cassidy

Maj Gen W. F. Cassidy will assume duties Mar. 1 as Commanding General of the U.S. Army Engineer Center and as Commandant of the U.S. Army Engineer School, Fort Belvoir, Va. Deputy Chief of Engineers for Construction since April 1962 he now serves directly under the Chief of Engineers, Lt Gen W. K. Wilson, Jr.

From 1959 to 1962 he was the Director of Civil Works in the Office of the Chief of Engineers, with direct supervision over the planning, construction and operation of flood control, navigation, hydroelectric power and other water resources development programs of the Corps of Engineers throughout the United States.

He is 54 years old, a native of Nome, Alaska, was commissioned in the Army Corps of Engineers in 1931 upon graduation from the U.S. Military Academy, West Point, N.Y., and is a graduate of the National War College.

In World War II he commanded Engineer troops specializing in the construction of airfields in the European and Mediterranean theaters of operation. He served in the Far East from 1958 to 1959 as Senior Logistics Adviser and Chief of the Advisory Group to the Republic of Korea Army. He was South Pacific Division Engineer from 1954 to 1958.

Air Force Testing Plastic Foam Concept in Space

A technological program for deploying plastic foam on expendable objects in space is the basis of a \$298,000 contract awarded the Good-year Aircraft Corp., Akron, Ohio, by the Aeronautical Systems Division, Wright Patterson Air Force Base.

(Research in use of foam plastics in construction was pioneered by the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va. See "Buildings in Barrels," April 1962 issue, page 22.)

Ultimate goal of the Air Force

ES&A Day Program Slated For National Capital Area

The annual Engineers, Scientists and Architects Day for the National Capital Area will be held Feb. 20 and will be highlighted by a symposium on space-age technology in addition to the awards for excellence.

Dr. S. Fred Singer, Director of the National Weather Scientific Center, has accepted an invitation to give the awards luncheon address. His subject is: "A Satellite Looks at the Weather."

A. William Christopher, Jr., of the General Telephone and Electronics Corp., is accepting reservations for the meeting at the Presidential Arms in Washington, D.C. Reservation requests, accompanied by a \$3.50 check for each, may be addressed to him at 1120 Connecticut Ave.

Dr. Richard A. Weiss, Deputy and Scientific Director of the U.S. Army Research Office, is in charge of Army participation in the ES&A Day, which will be a feature of the National Capital Area observance of National Engineers' Week, Feb. 17-23.

contract is a 45-foot diameter inflatable, spacetype solar collector. Initially, investigations will seek to establish the feasibility of remotely rigidizing accurate solar reflectors in a spatial environment.

The foam rigidization concept calls for a concentrator packaged in a small cylinder during launch. At a predetermined altitude compressed gas will be forced into the folded reflector to deploy it, and a lightweight plastic foam will be released to flow between the aluminized surface of the collector and an outer wall of film. The foam then rigidizes, forming the structure.

Results of the study may lead to accurate, lighter weight space reflector designs for future Air Force and National Aeronautics and Space Administration programs.

CE's General Lincoln Moved To Ryukyu Islands Position

Maj Gen Lawrence J. Lincoln, Commanding General, U.S. Army Engineer Center, and Commandant, U.S. Army Engineer School, Fort Belvoir, Va., has been reassigned to Headquarters, USARYIS/IX Corps, Okinawa, Ryukyu Islands, effective this month.

During his Army career of almost 30 years, he has held high engineering commands and has won the Legion of Merit and Commendation Ribbon (OLC) for his services. He served as one of five U.S. Commissioners on the post-World War II Joint U.S.—Soviet Commission in Korea, and as Deputy Chief of Staff for the Task Force which made the 1948 atomic tests in the Pacific.

6 Foreign Analysts Studying Techniques at RAC



Wilhelm Buechen

Maj Pierre Willemez

Capt Alexandre Cruveille



Capt Yves M. Brunard

Joachim Heyden

1st Lt. Jean De Smet

As part of a program to train alien personnel in American operations research techniques, the Research Analysis Corporation (RAC) is currently host to six European guest analysts from Germany, Belgium and France.

Proposed by the Office, Chief of Research and Development in March 1961, the international training program serves a dual purpose. In addition to utilizing the Data Exchange Agreements effectively to strengthen the capabilities of the NATO alliance, it provides a positive means of developing cooperation in research.

Representing the German Ministry of Defense are Wilhelm Buechen and Joachim Heyden.

A graduate of Berlin-Friedenau Gymnasium, Mr. Buechen did post-graduate work in physics, chemistry and mathematics at the University of Berlin. He received his degree in physics in 1934 and has done research in external and internal ballistics. He was employed by the U.S. Army Military Government in Berlin after the war and also worked for the British Ministry of Supply in West Germany.

Mr. Heyden was graduated from the Goethe-Paedagogium, Berlin-Charlottenburg in 1953, and did post-graduate work in mechanical engi-

neering in 1959. He has served as an engineer with Siemens and Halske Laboratory in Berlin, and prior to joining RAC was a technician with the German Mission to Lockheed Aircraft, Los Angeles.

Belgium is represented by Air Force Capt Yves Brunard and Army Lt Jean De Smet.

Capt Brunard attended the Royal Military School in Brussels and the Air Force School at Nivelles and Salfroenberg. His military experience includes duty with a unit for maintenance of electronic material for the Belgian Air Force and professor of general mathematics and electronics. His most recent assignment was military operational analyst at Brussels Center for Military Studies.

Lt De Smet attended the Brussels Military Academy and the Belgian Ordnance School at Tournai. An engineer of the Training School of Artillery and Engineering Corps, Ballistics Section, Brussels, he holds a certificate in Statistics and Operational Studies from the Statistics Institute of the University of Paris. He has served in an ordnance company of the Belgian NATO Forces in Germany and more recently with the Operations Research Section of the

Center of Military Studies in Brussels.

France is represented by Maj Pierre Willemez and Capt Alexandre Cruveille, both of the Operations Research Section, French Army.

Maj Willemez, a graduate of L'Ecole Nationale Supérieure de l'Armement, and St. Cyr, has a degree in philosophy and a B.S. in mathematics. He has served in Morocco, Indochina, Tunisia, and more recently in Algeria.

Capt Cruveille did graduate work in mathematics, physics and chemistry at the National Institute of Electricity and is a graduate of St. Cyr and the General Staff School. He has served in Algeria, Indochina, Morocco and Germany.

French Army recognition of the value of the program is demonstrated by assignment of Lt Col Marcel Guerin, Chief of Operations Research Section, French Army General Staff, to supervise the participation of Maj Willemez and Capt Cruveille.

RAC Announces Choice Of 3 Staff Assistants

Dr. Sidney J. Slomich, Col Robert H. Cole (USA, Ret.) and Merrill W. Hall recently joined the staff of the Research Analysis Corporation (RAC), Bethesda, Md.

Slomich and Cole have been assigned as operations analysts to the Conflict Analysis Division and the Special Studies Group, respectively, and Hall is personnel manager.

Slomich, who joined RAC after serving some 10 years with the Central Intelligence Agency, received his A.B., A.M., and Ph. D. degrees from Harvard in 1944, 1948 and 1951. From 1951 to 1952, he was a research associate at Yale University, with a research team sponsored by RAC's predecessor organization, the Operations Research Office of the Johns Hopkins University.

Cole spent four years as Chairman, Doctrine and Studies Division on the faculty of the Army War College before retiring from the Army and has served in various instructional and command positions. He received a B.S. degree from the University of Wyoming and an M.A. in international affairs from George Washington University, Washington, D.C.

Hall was most recently manager of employment for General Electric's Atomic Power Equipment Department in San Jose, Calif. After receiving a B.A. degree in business psychology from Hanover College, he won an M.B.A. at Indiana University.

Test Technique Developed for Materiel Reliability

A new technique for testing the reliability of components and equipment in weapons and space systems development programs has been announced as part of the U.S. Army Shillelagh missile development.

The announcement was made by H. J. Langlie, manager of the Reliability Department, Aeronutronic Division, Ford Motor Co. The method, he said, is also being applied successfully to other programs.

Shillelagh, a light, surface-to-surface missile system, is being developed under the supervision of the U.S. Army Missile Command, Redstone Arsenal, Ala.

Langlie said the test method is de-

signed to establish the existence of "safety margins" for short-lived components of materiel systems.

Reliability, he explained, is established normally by operating equipment under increasingly severe environmental stress conditions until failure occurs. In the case of short-lived or "one-shot" items, it is possible only to anticipate a stress level, then operate the specimen under this environment to see if it functions successfully.

The new method includes a procedure for selecting environmental test levels and analyzing test data, using a digital computer to calculate the statistical properties of equipment.

Following thousands of computer-simulated experiments to perfect the approach, the test method was used successfully in performing reliability tests for the Shillelagh program.

Maj Edward M. Riddlehoover, Chief of the Shillelagh Branch of the U.S. Army Missile Command, recently commended Langlie for a paper on the new test method. The paper was presented by Langlie at the Eighth Conference on the Design of Experiments in Army Research, Development and Testing, held at Walter Reed Institute of Research in Washington, D.C.

A new Army Regulation, stressing materiel reliability, is described on page 1 of the Dec. 1962-Jan. 1963 issue of this publication.

EJC Program Proposes Tech Information Gains

The Engineers Joint Council (EJC) has announced a program designed to improve the engineer's utilization of technical literature and application of information processing systems.

Reported in the Winter 1962 edition of *Engineer*, the plan is contained in a position paper with an outline and time schedule of activities which may lead to the development of an information center for the engineering profession.

The plan was prepared by Walter M. Carlson, Chairman of the Information Systems Committee of the EJC and newly appointed Defense Director of Technical Information, Office of the Director of Defense Research and Engineering.

In addition to the information center, the position paper calls for EJC effort and leadership in:

- Providing assistance to Government agencies active in improving their handling of information.
- Initiating programs to teach students how to use information resources.
- Encouraging the wide application of data processing machines to engineering design activities.
- Updating practicing engineers in the use of data processing technology.
- Promoting compatibility in data processing equipment made by different manufacturers and used for engineering computation and related forms of processing.

Entitled "Proposed EJC Course of Action in the Field of Information Systems," the 44-page document is available from the Engineers Joint Council, 345 East 47th Street, New York 17, N.Y., at 50 cents a copy.

BRL Scientist Receives 1962 Zornig Award

Outstanding support of the research mission of the Army Ballistic Research Laboratories (BRL), Aberdeen Proving Ground, Md., has won Dugald C. Jackson, Jr., the 1962 Zornig Award.

Col Richard R. Entwistle, Commander of the BRL, presented the award to Mr. Jackson, Chief of the Ballistic Institute and Scientific Educational Adviser, at a ceremony attended by 45 friends and coworkers. Two of the three previous award winners, Frank H. Sirangelo and Oliver H. Steele, were present.

Col H. H. Zornig (Ret.), founder of the BRL in 1935, established the award, consisting of a \$100 U.S. Savings Bond and a plaque, in 1959. Acclaimed then as the U.S. Army's foremost authority on ammunition, he now lives in Coral Gables, Fla.

Graduated from Harvard University in 1917, Mr. Jackson served in World War I and then continued his

education at Massachusetts Institute of Technology, earning a masters degree in 1921. Two years later he earned a degree in electrical engineering at University of Missouri.

After serving as assistant professor of electrical engineering at Trinity College and Duke University, he became dean of the School of Engineering at the University of Notre Dame in 1939. In World War II, he served in the Ordnance Corps, rising to the rank of colonel, and was awarded the Army Commendation Ribbon in 1946.

In 1947 he authored a scientific text, "The Profession of Engineering." He is a member of the American Institute for Electrical Engineering, American Society for Mechanical Engineering, American Society of Civil Engineers, American Society of Electrical Engineers, National Society of Professional Engineers, and the Society for the Advancement of Management.



Dugald C. Jackson receives the 1962 Zornig Award from Col Richard R. Entwistle, Commander of Army Ballistic Research Laboratories, as Mrs. Jackson and C. W. Lampson, Technical Director of BRL, observe the ceremony.

Use of Nuclear Energy in Food Preservation Hailed at Natick

Cooperative effort of the Free World in harnessing nuclear energy for peaceful uses was hailed at the International Conference on Radiation Research held Jan. 14-16 at the U.S. Army Radiation Laboratory, Natick, Mass.

The meeting was sponsored jointly by the National Academy of Science-National Research Council Advisory Board on Military Personnel Supplies and the U.S. Army Materiel Command's Quartermaster Research and Engineering Command Center.

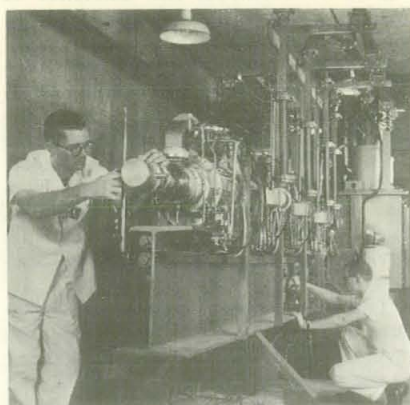
The highlight of the conference was provided when one of the world's largest concentrations of radioisotope cobalt 60 became operational. Its 1.3 million curies of ionizing energy will be used to preserve food intended to withstand long periods of storage.

The more than 350 conferees, including some of the world's leading nuclear scientists and food technologists, viewed the cobalt 60 reactor in its protective pool. They also observed a second energy source for food preservation, the 24-million electron volt, 18-kw. Linear Accelerator.

Seventeen speakers from Canada, Denmark, England, France, Italy, Japan, West Germany and the U.S. presented papers on radiation research in physics, chemistry, biology, food processing and medicine.

Reports cited the economic, cultural and social benefits within reach of their countries and the underdeveloped nations of the world as a result of the united effort of scientists in countries of the West.

Charles Weitz, coordinator of the "Freedom from Hunger" program, Food and Agricultural Organization



The 24-Mev., 18-kw. linear accelerator, shown above, and a 1.3 million curies cobalt-60 source provide energy used in preservation of food at the U.S. Army Radiation Laboratory.

of the United Nations, was guest speaker at the Conference banquet.

In a joint statement, Brig Gen Merrill L. Tribe, Commanding General of the QMREC laboratories, and Dr. Dale H. Sieling, Scientific Director, acknowledged Congressional and Executive support for the program since 1953, saying:

"Since 1953, the U.S. Army has assumed world leadership in developing the process of preserving food by ionizing energy. This effort has had the continuing support of the Interdepartmental Committee on Radiation Preservation of Food, the Joint Committee on Atomic Energy of the Congress, and the National Academy of Sciences-National Research Council. The Radiation Preservation of Food program directly furthers the objectives of the President's Atoms-for-Peace and Food-for-Peace programs.

"While its foreseeable military importance to the United States and its Free World allies is obvious, it is generally accepted that food preserved by ionizing energy offers the most promising and happy prospect for the peaceful use of atomic energy to the various peoples throughout the world."

The Army will effect a smooth transition toward concentrating on military requirements in processing of foods with ionizing energy, Natick officials said. Nonmilitary departments, it was explained are approaching a position of being able to carry leadership responsibilities program.

Stated Army objectives include:

- Directing research toward the objective of procurement from the civilian economy of the first generation of a relatively few food items of important military significance.
- Developmental lead time will be compressed to the maximum extent feasible, consistent with the state-of-the-art and the requirement for the prior orderly resolution of the key fundamental research problems.
- Close collaboration with industry during the research stage to facilitate the earliest transition to process engineering and production.
- Inasmuch as Army activity will continue to serve as the backbone of the Nation's effort in this program area, generous cooperation will be extended to other organizations in the joint advancement of the President's Atoms-for-Peace Program.
- Since an adequate civilian production base is required before military subsistence requirements can be met, cooperation with American industry will be encouraged.
- Information will be disseminated as widely as feasible in order to increase technical know-how.

Army officials believe that feasibility of food processing with ionizing energy is affirmed by data collected to date, and that the point of practicable utilization is being approached. The process could introduce a new flexibility into processing, transport, storage, and even marketing of foods, with major economic benefits.

Officials caution, however, that there are still problems to be solved before attempts at commercial exploitation are likely to be successful, adding that these problems present a challenge to research and should be regarded in this light.



CLOSED CIRCUIT TV is used to monitor experimental food processing at the U.S. Army Materiel Command's Radiation Laboratory at Natick, Mass.



Speakers, Session Chairmen at International Conference on Radiation Research

Left to right, seated: Dr. Cyril Reid, University of British Columbia, Vancouver, Canada; Dr. W. George Parks, Executive Director, National Research Council; Dr. Dale H. Sieling, Scientific Director, QM R&E Center, Natick; Dr. Ken-ichi Shinohara, Tokyo Laboratory Director, Japanese Association for Radiation Research on Polymers. Standing: Dr. Edward S. Josephson, Associate Director for Food Irradiation, U.S. Army Radiation Laboratory; Brig Gen Merrill L. Tribe, QM R&E Center; Dr. Pierre Leveque, AEC Nuclear Studies Center, Saclay, France; Dr. John

Kuprianoff, West Germany, Federal Research Institute for Food Preservation; Dr. A. J. Seallow, Paterson Laboratories, Christie Hospital and Holt Radium Institute, Manchester, England; Dr. Samuel A. Goldblith, Food Science Department, MIT; Dr. Ralph G. H. Siu, Scientific Director, Army Materiel Command; Dr. John E. Willard, University of Wisconsin; Dr. Leon M. Dorfman, Argonne National Laboratories, Argonne, Ill.; Dr. S. David Bailey, Chief, Pioneering Research Division, QM R&D Center; Dr. Nicholas Raica, U.S. Army Medical Research and Nutrition Laboratory, Fitzsimmons General Hospital, Denver.

DIGESTS OF PRINCIPAL SPEECHES: The Honorable Robert E. Wilson, member of the Atomic Energy Commission, referring to the Food Radiation Laboratory, commented:

"This facility uses the world's largest cobalt-60 source, or a million times the radiation given off by one gram of radium. If enough radium were available in the world to supply this amount of radiation, it would cost about \$26 billion."

The role of the Atomic Energy Commission, Mr. Wilson said, requires the supplying of radioisotopes for research conducted by some 6,000 medical, industrial and research groups.

In listing the various means by which radioisotopes have been useful and the ways in which greater benefits will be derived, he noted that 40 commercial firms and a number of foreign countries purchase bulk quantities of radioisotopes.

"Radioisotopes," Mr. Wilson explained, "provide ultrasensitive tracers for all biological and chemical systems, including living plants, animals and humans. They also help industry design better tools, mixers and other equipment."

Radioisotope emanations can be used, he said, "to measure an object's thickness and indicate imperfections; can modify chemical materials, destroy cancerous tissues, prevent infections from reproducing, and kill bacteria."

DR. ARI BRYNJOFSSON, a distinguished representative of the Danish Atomic Energy Research Establishment at RISØ, Roskilde, and currently assigned to the U.S. Army Food Radiation Laboratory, congratulated the Army on its pioneering research in food preservation.

"The smaller nations, to a high degree," he said, "depend on the research work carried out by the larger nations." He discussed measures to improve dose uniformity and efficiency.

DR. SAMUEL A. GOLDBLITH, Food Science Department, Massachusetts Institute of Technology, stated: "Never before in the recorded history of man has there been located in one place so much harnessed nuclear energy dedicated solely to the good of mankind."

In reviewing two decades of research and development radiation preservation of foods, he complimented the U.S. Army Quartermaster Corps

for funding radiation research studies since 1943 and "opening new vistas of food preservation." He cited the approval in 1953 of Dr. Ralph G. H. Siu's feasibility report relative to radiation preservation of foods as a milestone of scientific progress.

"From this beginning," he explained, "arose a tremendous scientific program, providing information leading toward a relatively new method of food preservation. . . ."

"Under this (Quartermaster Research) program, we have learned to remove 18 kilowatts of electrons from a tube window at 8, 12 and up to 24 Mev! While we may never utilize energy levels at 24 Mev for food preservation, the information developed in learning how to produce 18 kw. of 24 Mev electrons will be invaluable to many other scientific programs involving high energy physics.

"Today we have more fundamental information than we had a decade ago, or even five years ago, and with this, more prospects, more promises, and hopefully, more fulfillments.

"Through the Quartermaster Corps program, data on the wholesomeness of some 21 irradiated foods have been

(Continued on page 20)

International Conference on Radiation Research

(Continued from page 19)

obtained. Two petitions for a regulation permitting the use of irradiated foods are now in the hands of the Food and Drug Administration for action. Once these have been acted upon, prophecies will become less daring, more accurate and less fanciful."

DR. CHARLES WEITZ, "Freedom from Hunger" program coordinator, United Nations Food and Agricultural Organization (FAO), Rome, Italy, discussed the solving of problems of food shortages and losses due to spoilage throughout the world.

"This unique facility will make significant contributions. By the use of better methods of preservations or preventing loss through spoilage, the world's food supply can be significantly extended.

"Food losses due to rodents, insects and microorganisms are estimated to run between 10 and 30 percent the world over, with the highest losses in the underdeveloped nations, and in countries badly in need of food.

"Freedom from hunger is an ancient dream of humanity. We need a constant stream of new facts and ideas in the field of food production, new techniques and the ways to apply them.

"It is, therefore, of great significance that this major radiation research facility of such excellence is dedicated to preserving better our food, to improvements in our food, and to the production of new processed food. It will play a vital role in making better and cheaper foods available to underdeveloped nations.

"May I convey the best wishes of the Director-General of FAO to your organization. We have high expectations and I am sure that these will be fulfilled."

DR. NICHOLAS RAICA, Chief, Irradiated Food Branch, U.S. Army Medical Research and Nutrition Laboratory, Fitzsimons General Hospital, Denver, Colo., told the conferees that there was no evidence of toxic effects following short-term human feeding studies with 54 irradiated foods during 1957-1958. Thirty-three men, between the ages of 19 and 24, participated in the test.

He also noted that a study of the acceptability of irradiated (sterilized) pork and bacon (stored 10-12 months at room temperature) was conducted at Fort Lee, Va., in 1958. The conclusions were that "radiation preserved foods were as acceptable as the standard nonirradiated food.

"It is evident from the tremendous volume of data accumulated from wholesomeness studies, with few exceptions, that foods irradiated at 5.58 Mrads are wholesome, and their nutritional adequacy is comparable to conventionally heat-processed foods."

DR. JOHN KUPRIANOFF, Federal Research Institute for Food Preservation, Karlsruhe, Baden, Germany, reviewed West Germany's food and associated radiation research.

The Federal German Government in 1957 established two research centers for investigations into the fields of foodstuffs and agriculture. In addition to the fundamental research in dosimetry, and on the different biological and chemical effects of irradiation on foodstuffs and their components, some technological studies have been started on the possible processing techniques.

Dr. Kuprianoff noted that feeding experiments to determine the limits of dosage in wholesomeness studies have been restricted to rodents.

He concluded with the hope "that the construction of the central laboratory in Karlsruhe in 1963 will enable Germany to work in this important field in an adequate way and to contribute more than in the past to the science of irradiation and irradiation techniques of foodstuffs."

DR. PIERRE LEVEQUE, representing the French Atomic Energy Commission Nuclear Studies Center, Saclay, France, detailed the state of radiation research in France.

The greatest interest lies in graft polymerization, he explained, but investigations are also being conducted into the effects of radiation on steel, textiles, petroleum, coal, rubber, cellulose and its derivatives, synthesis of vitamins and dyes.

DR. A. J. SWALLOW, Paterson Laboratories, Christie Hospital and Holt Radium Institute, Manchester, England, spoke of the present views on the irradiation of selected organic compounds in aqueous solution.

In his technical presentation with slide projected chemical equations, he reviewed the response of irradiation of such organic compounds as amino acids, cysteine, proteins and organic redox systems. He also detailed investigations concerning interference with radical recombination, suppression of molecular yields, ionic effect and Gel effects.

DR. KEN-ICHI SHINOHARA, Tokyo Laboratory Director, Japanese Association for Radiation Research on

Polymers, said radiation research in his country began eight years ago, and now comprises some 80 research groups. The emphasis is on irradiation of polymers to improve fibers, the most important industry in Japan.

In 1954, research was started by groups interested in agricultural chemistry and in the fishing industry, Dr. Shinohara recalled. He said that their principal emphasis was on seafoods and the radiation treatment of fermentation products.

DR. RALPH G. H. SIU, Scientific Director, Army Materiel Command, traced the availability of food as a powerful factor in the evolution of civilization, beginning with the Neolithic man of 8,000 years ago to the present day.

United States authorities, he noted, are reviewing requests relative to low-dose procedures for insect deinfestation of grain, as well as high-dose sterilization of bacon.

Referring to the U.S. Army Radiation Laboratory, Dr. Siu commented:

"To us in the Army, the Radiation Laboratory is a symbol of the good qualities of man; a symbol of the capacity of man to give concrete expression of visions leading to the betterment of man.

"It is a symbol of the perseverance of man, the ingenuity of scientists, the selflessness of man. It is a symbol of international cooperation."

Other speakers who presented papers on radiation research were:

Dr. Erwin J. Hart, "Chemical Dosimetry at High Dose Rates," and Dr. Leon M. Dorfman, "Pulse Radiolysis: Fast Reaction Studies in Radiation Chemistry"; both from the Argonne National Laboratory, Argonne, Ill.

Dr. John E. Willard, Department of Chemistry, University of Wisconsin, "Radiation Chemistry of Gases."

Dr. Walter Gordy, Department of Physics, Duke University, Durham, N.C., "Radiation Chemistry in the Solid State as Studied with Electron Paramagnetic Resonance."

Dr. Cyril Reid, Department of Chemistry, University of British Columbia, Vancouver, Canada, "Mechanisms of Ultraviolet and High Energy Radiation Damage."

Dr. Ernest C. Pollard, Biophysics Committee, Pennsylvania State University, University Park, Pa., "Radiation in Biological Systems."

Dr. William J. Darby, Professor and Chairman, Department of Biochemistry, Director, Division of Nutrition, Vanderbilt University, Nashville, Tenn., "Wholesomeness of Irradiated Food."

Army Announces Contracts Totaling More Than \$485 Million

Contracts for research, development and procurement of military materiel and services aggregating more than \$485 million were announced recently by the Department of the Army.

Three contracts totaling \$45,623,042 were awarded to Raytheon Co., Lexington, Mass., for Hawk missile system battery sets and field maintenance, missile guidance and control systems, and engineering services.

Western Electric Co., New York, N.Y., received four contracts totaling \$40,102,002 for research and development work on Nike Zeus radar and ground guidance systems and control equipment for the Nike Hercules.

The basis of six contracts totaling \$39,694,216 awarded to Chrysler Motors Corp., Detroit, Mich., is production of 10,000 ¾-ton trucks, 1,161 school buses, 8,248 sedans, 1,070 station wagons, 471 pickup trucks, and engineering for the M60A1 tank.

Production of ammunition is specified in three contracts totaling \$39,005,697 given to Minneapolis Honeywell Regulator Co., Hopkins, Minn. Other contracts for ammunition include: \$16,530,864 to Mason and Hanger, Silas Mason Co., Inc., New York, N.Y.; \$7,000,000 to Anron Corp., Waukesha, Wis.; \$5,942,177 to Aerojet General Corp., Downey, Calif.; \$5,697,154 to Remington Arms Co., Inc., Bridgeport, Conn.; \$4,310,978 to Sperry Farragut Co., Bristol, Tenn.; \$4,953,390 to Ingraham Co., Bristol, Conn.; and \$2,653,906 to FMC Corp., New York, N.Y.

For production of 9,600 ¼-ton utility trucks, Willys Motors, Inc., Toledo, Ohio, received a \$28,233,660 contract. DeHavilland Aircraft of Canada, Ltd., Downsview, Ontario, was awarded a \$25,839,665 contract to produce 48 CV-2B (AC-1A) Caribou transport aircraft.

Two contracts totaling \$24,561,713 went to International Harvester Co.,

Chicago, Ill., for 3,703 2½-ton trucks and 573 motor buses. Sperry Rand Corp., Salt Lake City, Utah, was given two contracts totaling \$23,227,786 for Sergeant missile system equipment. Sylvania Electronics Systems, Needham, Mass., received a \$19,500,000 classified contract.

For Pershing missile guidance and control components and ground support equipment, Bendix Corp., Teterboro, N.J., was awarded a \$19,409,630 contract. Production of 4,147 2½-ton trucks is ordered in a \$17,800,000 letter contract awarded to White Motor Co., Lansing, Mich.

Studebaker Corp., South Bend, Ind., won a \$16,000,000 letter contract for 4,192 2½-ton trucks. For the production of 376 5-ton amphibious vehicles (LARCs), Consolidated Diesel Electric Corp., Stamford, Conn., received an \$11,697,736 contract.

An \$8,929,843 contract let to Hercules Powder Co., Wilmington, Del., is for rocket motors and production support of the Minuteman missile. General Motors Corp., Indianapolis, Ind., received four contracts totaling \$8,823,180 for transmissions for the M-113 personnel carrier and the XM-106 mortar carrier, engines for the M110 self-propelled artillery and T120E1 armored recovery vehicle, and engineering on the T114 personnel carrier and various self-propelled howitzers.

FMC Corp., San Jose, Calif., was awarded two contracts totaling \$8,238,884 for 694 armored personnel carriers and parts for the M59 personnel carrier. For field protection masks and filter elements, Mine Safety Appliances, Pittsburgh, Pa., received contracts totaling \$6,714,840.

A \$6,194,603 contract let to American Hoist and Derrick Co., St. Paul, Minn., is for production of 20-ton truck-mounted cranes and related equipment. Collection of missile in-flight data and new instrumentation

at the White Sands Missile Range are called for in two contracts totaling \$6,102,603 awarded to Land-Air, Inc., Chicago, Ill.

Diamond T Motor Truck Co., Chicago, Ill., received a \$5,861,338 contract to produce 585 5-ton trucks. A \$5,706,421 contract went to Douglas Aircraft Co., Inc., for Nike Hercules missile airframes.

Two letter contracts totaling \$5,000,000 let to General Electric Co., Syracuse, N.Y., are for high power radar and retrofit kits for the Nike Hercules missile system. General Dynamics, Pomona, Calif., received a \$4,240,469 letter contract for continued research and development on the Mauler missile program.

A \$4,191,569 contract awarded to Frank G. Hough Co., Libertyville, Ill., is for 259 diesel-driven loaders. Sylvania Electric Products, Inc., Mountain View, Calif., received a \$4,189,085 classified contract.

Radio Corporation of America, Moorestown, N.J., received a \$3,399,020 contract for continuation of a down-range antimissile measurement program for 1963. Ordered in a \$3,201,240 contract let to Continental Motors Corp., Muskegon, Mich., are 1,442 engines for the 5-ton truck.

Additional contracts included: Telecomputing Services, Inc., Panorama City, Calif., \$2,021,823 for data reduction services at White Sands Missile Range, N. Mex.; Northrop Corp., Anaheim, Calif., \$2,020,724 for Hawk missile wing assemblies; Universal Match Corp., Ferguson, Mo., \$2,003,266 for 17 erector launcher-transporters for the Pershing missile system; Aircraft Radio Corp., Boonton, N.J., \$1,930,427 for 825 aircraft receiver sets; Rohm and Haas Co., Philadelphia, Pa., \$1,663,050 for continued research on solid propellant rocketry;

Caterpillar Tractor Co., Peoria, Ill., \$1,628,804 for 132 diesel-powered tractors; Allis-Chalmers Manufacturing Co., Tulsa, Okla., \$1,422,910 for the design, manufacture, delivery and test of two hydraulic turbines; Walter Kidde and Co., Inc., Belleville, N.J., \$1,398,600 for rocket motors for antiaircraft target drones; Elgin Watch Co., Elgin, Ill., \$1,260,176 for telephone communications equipment; Douglas Aircraft Co., Santa Monica, Calif., \$1,087,012 for research in connection with the development of biological warning system; and Stanford Research Institute, Menlo Park, Calif., for research on improving tropic military communications.



YUH-1D Iroquois prepares for U.S. Army tests in Alaska after completing Air Force tests in temperatures ranging from -65° to 125° F.

Army Institute of Environmental Medicine Reports on Program

Discoveries that will provide adequate protection against two of the bitterest foes of the combat soldier, weakening heat and numbing cold, are prime goals of scientists at the U.S. Army Research Institute of Environmental Medicine, Natick, Mass.

Established in October 1961 as a Class II installation of the U.S. Army Medical Research and Development Command, the Institute is located in the U.S. Army Quartermaster Research and Engineering Center, U.S. Army Materiel Command.

Ways of conditioning the body to withstand extremes of heat and cold is one approach to the Institute's mission of increasing the combat capability of soldiers in any environment.

More basic to the problem is development of new lightweight clothing that will provide a maximum of protection against heat or cold and a minimum of encumbrance that limits mobility.

One of the most imaginative approaches to the overall problem (no pun intended) is the "thermal equilibrium suit" (see page 19, Vol. 4, No. 1 of this publication). In experimental models which have been subjected to exhaustive tests, temperature and humidity of the suit are thermostatically controlled to provide the soldier with a "built-in climate."

Among current studies at the Institute to determine the effects of clothing design, subsistence, equipment and environmental stress on the operational effectiveness of the combat soldier, the thermal equilibrium suit is presenting a developmental challenge.

Similar in design to the suit worn by astronauts, with respect to being



Inside arctic test chamber, soldier volunteers fit pegs into holes to determine the effects of environmental stress on ability to function in heavy garments for extreme cold climates.

chemically impermeable, the test model has integral mechanical air conditioning and dehumidifying gear.

In conducting its research on clothing, effects of stress and other factors related to effectiveness of the fighting man under varying conditions, the Institute makes extensive use of climatic chambers.

Each of the chambers is 60 feet long, 11 feet wide, 15 feet high, and can accommodate up to 25 volunteer test participants at a time. Temperatures can be precisely controlled within a range from -70° to 165° F.

Studies in the chambers may combine a range of environmental factors, including wind, humidity, air temperature, solar radiation, long-wave radiation (heat gained or lost to

the sky or surrounding objects) and rain, sleet, ice or snow.

Prior to the founding of the Institute of Environmental Medicine, the Army Medical Service efforts to clarify the understanding of man's response to extremes of climate were exerted largely by the Environmental Medicine and Physiology Divisions of the U.S. Army Medical Research Laboratory at Fort Knox, Ky.

During World War II, this group of investigators carried on significant studies of heat exhaustion and heat acclimatization. After 1955, their efforts concentrated predominantly on basic and applied cold research.

Meanwhile, the Environmental Protection Research Division of the QM Research and Engineering Command at Natick provided physiological support to the QM program of protective clothing research and development.

Increasing importance of a closely coordinated effort to provide environmental protection to the individual soldier resulted in consolidation of the Fort Knox and Natick research with the founding of the Institute.

Lt Col Hall, commanding officer of the Institute since March 1962, commented on its mission as follows:

"Our program involves basic and applied research effort and coordination. Our basic research effort is directed toward a clarification of the highly involved mechanisms by which man and animals respond to and defend themselves against the environmental stresses of heat, cold and terrestrial altitude.

"The applied research effort, in essence, seeks to provide for practicable techniques and procedures to improve the performance of the individual soldier under extremes of exposure.

"The physiology of work and of physical conditioning is intimately related to man's response to these stresses, and an important portion of both our applied and basic research efforts will be directed to their study.

"Coordination is an important part of the Institute mission. The highly diversified potential hazards of modern warfare, including techniques of chemical and biological warfare, have imposed increasingly important and difficult demands for the development of protective clothing.

"The soldier must function in the environment which exists within such protective clothing systems. . . . In important ways, this climate is determined by the design and materials of the protective clothing.



Test participants relax with exercise inside tropic chamber at the Quartermaster R&E Command, Natick, Mass. Tests may be conducted under diversified conditions and last from 90 seconds to several weeks.

"In this sense, and also in many other areas including troop carrier equipment, equipment for transportation of the wounded, and in at least certain types of constructed shelters, the soldier is confronted with an artificial climate . . . determined by engineering.

"The intricate interactions between the individual soldier and such engineering climates impose a pressing demand for close coordination between the Institute, other Army Medical Service activities and equipment research and engineering efforts, particularly those of the development of protective clothing."

Studies in acclimatization, it was stated, provide a better understanding of the reactions of men in hot and cold climates—what the body defenses are, and how to develop them.

An illustrative study, currently in its early stages, is to determine the effects of salicylates on men working in the heat. Closely allied to aspirin, salicylates are used to reduce the temperature of patients with fever. This study hopes to determine how salicylates might influence the body's temperature adjustment to heat.

ARPA Introduces Series Of Unclassified Lectures

Dr. S. Fred Singer, Director of the National Weather Satellite Center, Suitland, Md., opened the 1963 series of unclassified lectures sponsored by the Advanced Research Projects Agency, Office, Secretary of Defense.

The noted physicist and meteorologist spoke Jan. 16 at the Pentagon, Washington, D.C., on "A National Operational Meteorological Satellite System." The presentation was illustrated by color slides of pictures taken by the TIROS V and VI weather satellites whose cameras are still operable, he said.

The schedule of ARPA lectures to be given in the Pentagon, Room 5A 1070, at 3:00 p.m. includes:

Feb. 19—Dr. Mael Melvin, Professor of Physics, Florida State University, "Symmetry in Nature and Science."

Mar. 20—Frank Long, Arms Control and Disarmament Agency, U.S. State Department, who will discuss the work of his agency.

Apr. 24—Dr. Charles P. Slichter, Professor of Physics, University of Illinois, "Material Sciences."

May 22—Dr. Frank Press, Professor of Geophysics, California Institute of Technology, "Crust of the Earth."

In the research program on the effects of cold, acclimatization of experimental animals and of human volunteers to severe cold climate is under study. Comparison of those acclimatized with an unconditioned group is a valuable technique in gaining greater knowledge of this field.

Vance Extends ROAD Concept to All Army Elements

Plans for reorganizing under the ROAD concept (Reorganization Objective Army Division) all combat divisions in the Active Army, the Army National Guard and the Army Reserve have been announced by Secretary of the Army Cyrus R. Vance.

The decision to reorganize the Active Army follows the successful completion of field testing of the 1st Armored Division, Fort Hood, Tex., and the 5th Infantry Division (Mechanized), Fort Carson, Colo. Organized under the ROAD concept in February 1962, for test purposes, these divisions have demonstrated convincingly the soundness of the plan.

Continuing research into ways of enhancing the capability of the ROAD Infantry Battalion is underway at the Combat Developments Experimentation Center, Fort Ord, Calif. (See November 1962 issue, p. 15.) Personnel of the 1st Armored Division are involved in experiments to devise the best antitank weapons system for the battalion.

Reorganization of the Active Army will be accomplished on a phased basis and will be completed by late 1964. Maximum combat effectiveness of divisions, it was stated, will be maintained during the reorganization.

CE Civil Works Program Lists \$1 Billion in 1964

Among the appropriations requested in the President's budget message to the Congress in mid-January is the sum of \$1,086,916,000 for the Civil Works program of the Army Corps of Engineers in Fiscal Year 1964.

The funds requested would provide more than \$800 million for construction and over \$150 million for operation and maintenance.

Consisting of programs in the national interest, Corps of Engineers Civil Works functions are authorized and assigned by the Congress. Major programs are water sources and development, including investigations and surveys, the operation and maintenance of Federal flood control, river and harbor, beach erosion and power projects, and planning and directing of construction.

The Institute technical staff consists of scientists and technicians selected to provide a varied approach to the study of environmental physiology and medicine. It includes physiologists, psychologists, physicians, biochemists, physicists, anthropologists, pharmacologists and representatives of other technical skills.

tion with no diminution in readiness to perform contingency missions.

In order to make the Army National Guard and United States Army Reserve capable of compatible employment with the Active Army, the ROAD reorganization will be extended to those Reserve Component combat divisions scheduled for retention under the recently announced realignment plan.

The conversion of Army National Guard divisions to the new structure will be initiated as soon as agreement is reached between governors of the affected states and the National Guard Bureau on troop list and stationing plans.

Conversion of Army Reserve units, to be initiated immediately, will be accomplished without dislocation of the realignment of Army Reserve units currently in progress, because realignment was planned with ultimate reorganization to ROAD.

The ROAD reorganization of both the Army National Guard and the Army Reserve should be completed prior to the start of annual field training next summer.

Originally announced in June 1961, ROAD is the Army's answer to future land warfare. Emphasis is on increased flexibility, battlefield mobility, and firepower.

Present Army divisions are of three types—Infantry, Armor and Airborne. The change will provide four types of divisions—Infantry, Armor, Airborne and Mechanized, all with markedly increased capabilities over the Pentomic organizations.

The most important factor of the ROAD concept is the ability to tailor divisions to battlefield requirements. Each division has a common base including three brigade headquarters, division artillery, and other combat and support elements. Combat maneuver battalions—in infantry, mechanized infantry, tank and airborne—are added to the division base to fit any type combat situation. To form an armored division, for example, emphasis would be on tank and mechanized battalions. For an airborne division, emphasis would be on parachute infantry battalions.

Aberdeen Uses Radioisotopes as Materiel Testing Tool on Difficult Problems

Nuclear instrumentation and techniques are being used as analytical tools to solve ordnance materiel testing problems at Aberdeen Proving Ground, Md.

Russell R. Galasso, Chief of the Nuclear Applications Laboratory, Development and Proof Services, said activities seek solutions to testing problems which defy conventional methods, and aim to improve existing techniques.

"In our current study of wear characteristics of a relatively new multi-fuel engine," he explained, "we may want to determine at what point in time scuffing (catastrophic wear) develops and in which component or components it occurs.

"To accomplish this, we first send the part being studied—in this case a piston ring—to the CP-5 reactor at the Argonne National Laboratory in Illinois where it is bombarded with neutrons, making it radioactive.

"When we get the piston ring back and install it in the engine, our instruments can detect, by monitoring radioisotopes in the motor oil, when and how much wear occurs."

Galasso said wear of more than one part can be measured simultaneously by having additional parts bombarded with neutrons. Every element has its own "fingerprint," as in the case of chromium in the piston ring. Since the engine is made of iron, and iron isotopes have a different energy of



Daryl Hatfield, APG Nuclear Applications Section, takes readings from a decade scaler on sample of tools used in handling radioactive material.

disintegration than chromium isotopes, the amount of isotopes in the oil can be accurately measured.

Wear measurement is not the only function of the laboratory. Engine deposits, axle rotation, and leaks may be detected or corrosion studied by nuclear techniques. The lab is working on a nuclear torquemeter to measure twisting force on a shaft, and a nuclear tachometer for measuring velocity of a rotating shaft.

Many tests now conducted through conventional means could be performed in less time with greater accuracy through the nuclear process, Galasso believes.

Nuclear physicist First Lieutenant Allan Hilsmeier monitors a radio-active source with "cutie pie" high-intensity survey meter in a test at the Nuclear Applications Laboratory, Development and Proof Services, Aberdeen Proving Ground, Md. The source is shielded by lead bricks to reduce emission of radiation to undesired areas.

Aberdeen Proving Ground leaders report that many industries are using radioisotopes in tests which produce desired results in a matter of days as opposed to months of work through conventional testing methods.

Currently employing six persons, the Nuclear Applications Laboratory became operational in July 1961. As potential users become better acquainted with its capability, Galasso believes they will seek aid in solving more of their testing problems.

Automotive Engineers Told Of Army Needs to Reduce Noise in Tracked Vehicles

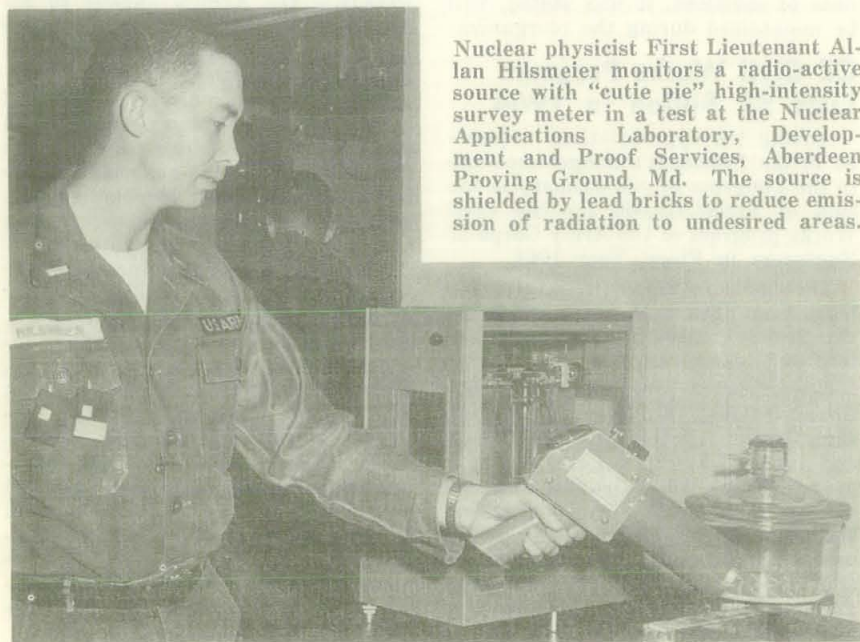
Paul Fair, Chief of the Acoustical Research Branch, Human Engineering Laboratory, Aberdeen Proving Ground, Md., spoke on "Analysis and Control of Operational Noise for Tracked Vehicles" at a recent meeting of the Society of Automotive Engineers in Detroit, Mich.

"The noise problem resulting from the operation of tracked vehicles," he said, "has become an important factor for consideration and control, because acoustic noise interacts with man and even with machines."

Examples were cited from tests made on three tracked vehicles—the M-113 Armored Personnel Carrier, the T120E1 Recovery Vehicle and the T-114 Armored Command and Reconnaissance Vehicle. In talking of the T-114 he stated:

"A low noise level is required for the following reasons: (1) to permit the crew to communicate with one another without the need of electronic communications, (2) to avoid permanent hearing loss, (3) to avoid temporary hearing loss, which varies in duration among individuals from minutes to days after exposure, (4) to allow personnel to operate in the vehicle without sustaining extreme discomfort, (5) to permit the vehicle to get as close to the enemy as possible without detection, and (6) to lower the noise and vibration level in order to reduce wear on vibrating parts."

Noise in tracked vehicles could be reduced, he said, by limiting the amplitude of the main forcing frequencies caused by the tracks and gas explosive forces, reducing the amplitude of vibration of the bolts, braces, fasteners, etc., placing acoustic barriers between the noise sources and the crew, or protecting personnel by the use of ear plugs.



Dr. Zahl, 31-Year Government Career Scientist, Receives Exceptional Service Award

Dr. Harold A. Zahl, an Army career scientist for more than 31 years and Director of Research at the U.S. Army Electronics Research and Development Laboratory, has received the Department of the Army's highest civilian award.

The Exceptional Civilian Service Award was presented Jan. 17 to Dr. Zahl by Maj Gen Stuart S. Hoff of the U.S. Army Electronics Command, Fort Monmouth, N.J., acting in behalf of Secretary of the Army Cyrus R. Vance. Ceremonies were held in the office of Col James M. Kimbrough, Jr., commander of the Laboratory.

The citation, signed by Mr. Vance, recognized Dr. Zahl for numerous achievements and scientific leadership during his conspicuously outstanding performance of duties from Aug. 7, 1931 to date. It stated, in part:

"His personal achievements and contributions in the fields of thermionics and radar have given added stature to our Nation's defense posture. His superior scientific knowledge, keen foresight and leadership, coupled with his understanding of research and development matters, have enabled him to make exceptionally outstanding contributions to the Army's research and development program.

"His dedication to duty and complete loyalty to the Army and his superiors command the respect of



Dr. Harold A. Zahl, Director of Research at USAERDL, receives Exceptional Civilian Service Medal from Maj Gen Stuart S. Hoff, Commanding General, U.S. Army Electronics Command, as Mrs. Zahl enjoys the occasion.

everyone with whom he has come in contact, reflecting great credit upon himself and the Department of the Army."

Among Dr. Zahl's better known achievements are invention of the GA-4 radar duplexing tube, which made it possible for the first time to transmit and receive from the same radar antenna, and VT-158, or "Zahl tube," which moved radar up into the 600-megacycle range.

He not only invented these tubes; he blew the glass for early models.

Graduated from the State University of Iowa, where he received his Ph. D. in physics in 1931, he was born in Chatsworth, Ill., and did his undergraduate work at North Central College, Naperville, Ill. A Fellow of the American Physical Society, he was one of the founding directors of the Armed Forces Communications and Electronics Association. The IRE honored him with the Harry Diamond Award in 1954.

Author of numerous scientific and technical papers, Dr. Zahl probably achieved his biggest readership in 1958 with the *Reader's Digest* article "Colton's Baby Comes Through," a first person story about one of radar's early successes. He also has written numerous science fiction stories under his own name and the pseudonym "Christopher James," which combines the first names of his two oldest sons.

The September 1961 issue of this publication, pages 20-21, carries what the editor considers one of the most appealing articles it has been privileged to publish on the rewards of Government career service for scientists. It was written by Dr. Zahl, who lives with his wife, the former Vera Virginia Hiller, and their three sons, James, Christopher and Harold, on a 50-acre farm in Holmdel Township.

Although the farm provides much of the Zahl's family produce, its chief crop is Christmas trees, most of which he personally planted.

SORO Extends Open Invitation to Seminar Series

The fifth presentation in the Special Operations Research Office seminar program reviewed "SORO's R&D Technology Research: Concepts of Purpose and Function."

Dr. William A. Lybrand, Chairman of the Basic Studies Division, outlined the nature of this longer range, interdisciplinary SORO research in terms of some of its major characteristics. His presentation dealt with substantive problem areas to be included, varieties of research approach, relationship to other SORO research and development, relationship to relevant non-SORO research and development activities, philosophy and operational format for conduct of research.

In addition to SORO research staff members, a number of guests from other organizations attended the seminar. Many requested copies of the matrix devised by Dr. Lybrand to aid in the determination of problems.

The SORO seminar series is de-

signed to provide a medium that will foster the exchange of SORO-related knowledge, research methodologies and instruments, and to subject SORO end products to the critical evaluations of colleagues.

Future seminars will feature results of particular research by members of the SORO staff and other research organizations, and discussions of cold war policy issues which contribute guidelines for social science research.

Members of the research community are welcome and, upon request, will be sent announcements. They may contact Miss Audrey Dixon, EMerson 2-4030, Ext. 75, Washington, D.C.

SORO is a behavioral and social science research organization of The American University, operating under contract with the Department of the Army.

Dugway Proving Ground Course Orients Top Leaders on CBR Weapons



Students at U.S. Army CBR Weapons Orientation Course are guided through CS, Army's newest riot control agent.

By 1st Lt Lawrence D. Doff

When Marshal Zhukov was Soviet Minister of Defense in 1956, he gave his views on what the next major war might be like. He was quoted as saying:

"The next military conflict, should it be unleashed, will be characterized by the massive use of air forces, rocket weapons and various means of mass destruction such as atomic, thermonuclear, chemical and biological weapons."

During the past few years a great deal has been written on rapid gains of the Soviet Union in increasing capability to engage in CBR operations. Meanwhile, comparatively little has been disclosed about similar advances in both offensive and defensive United States CBR capabilities.

International tensions and the resultant accelerated United States emphasis on civil defense have created a broadening demand for reliable information on CBR weapon systems, their capabilities and limitations, including protective measures.

In response to numerous requests



Students at Chemical, Biological and Radiological Orientation Course examine latest in protective equipment.

from Federal officials concerned with plans for national defense, the U.S. Army Chemical Corps CBR Weapons Orientation School was established in 1958 at Dugway Proving Ground, Utah, the Army's chemical testing center. Later the school was redesignated the U.S. Army CBR Weapons Orientation Course.

Consisting of 3½ days of intensive briefings, covering all aspects of CBR operations, the course is designed primarily for top military and civilian planners in the Department of Defense. As of Jan. 15, 1963, more than 2,500 students had completed the course, including more than 100 general officers and over 50 high-level Government leaders.

Realism is basic to the course. Stu-

Army Awards Study Contract On Human-Machine Reliability

An Army contract to study the reliability of the "human component" in large and complex electronic equipment and systems was awarded recently to the Aeronutronic Division of Ford Motor Co.

Called "Human Factors Aspects of Reliability," the program is being conducted for the U.S. Army Electronics Research and Development Laboratory, Fort Monmouth, N.J. The objective is a set of precise values which engineers may apply to determine the overall reliability of advanced electronic equipment.

Scientists in charge of the study have stated that expressing human reliability with numeric measurements will not be reducing man to numbers, but will enhance capabilities to tailor more precisely equipment or systems to man's needs.

Results of the study will be applied to "Operations Central," a project to develop the battlefield command post of the future.

dents get a practical demonstration of CBR agents and protective devices which makes them well aware of the dangers presented by such weapons, but at the same time builds their confidence in current capabilities of the United States.

Under the direction of the Commanding General, U.S. Continental Army Command, the course receives logistical support from Headquarters, Sixth U.S. Army. The faculty includes officers from the Chemical Corps and other branches of the Army as well as the Air Force, Navy and Marine Corps.

The director of the course is Col Thomas E. Marling, a graduate of Harvard University and the University of Wisconsin who formerly was Chemical Officer for the Theater Army Support Command in France.

Dugway Proving Ground's CBR Weapons Orientation Course helps to provide top level planners and policymakers with the kind of information that enables them to prepare more confidently for any aggressor act involving use of such weapons.



Concrete bunkers constructed for the CBR hard target complex are inspected by students before demonstration.

Munich University Honors Army Mobility Expert

Notable contributions in advancing U.S. Army land locomotion research have earned Dr. M. G. Bekker an honorary degree of doctor of engineering from the Technical University of Munich, Germany.

Col Charles D. Y. Ostrom, Jr., Chief, U.S. Army Research and Development Group (Europe), announced the award in a January 12 letter to Lt Col Wendell G. Van Auker, Chief of the Overseas Research Branch, U.S. Army Research Office, Arlington, Va.

Acclaimed as the "father" of land locomotion, Dr. Bekker founded the U.S. Army Land Locomotion Laboratory at Detroit, Mich. The lab is now under the Army Tank-Automotive Command, Center Line, Mich. He is presently Chief of Mobility Research at the Defense Research Laboratories, General Motors Corp.

During Dr. Bekker's investiture, Dr. H. von Sybel, Director of the Land Vehicle Institute of the University of Munich, called Dr. Bekker's book on "Theory of Land Locomotion" a description of the new branch of science "for which there is little precedent."

Dr. Sybel paid tribute to Dr. Bekker's "great achievement" in the synthesis of locomotion mechanics, soil mechanics and statistical-cartographic data processing to the combined discipline of land locomotion.

Following a visit to the Imperial College of Science and Technology in London, accompanied by Col Raymond J. Astor, U.S. Army Research Office (Europe), Dr. Bekker delivered the annual James Clayton Lecture on "Mechanics of Off-Road Locomotion."

A distinguished group of scientists and military leaders at NATO Headquarters turned out to hear him give the same lecture under auspices of the French Division of the International Soil-Vehicle Mechanics Society, Paris. He repeated his lecture in German at the University of Bonn for a select audience of university, military and government officials.

Dr. Bekker has written a second book, recently published, called *Off-the-Road-Locomotion*. In developing this new science he has studied technical aspects in Poland, Canada and at Aberdeen Proving Ground, Md. He has also been associated with the Operations Research Office (now Research Analysis Corporation), Stevens Institute of Technology, and the Land Locomotion Laboratory.

Dr. Bekker is credited with train-



Dr. M. G. Bekker (right), land locomotion research pioneer, receives an honorary degree of doctor of engineering from Dr. H. von Sybel, Director of the Land Vehicle Institute of the University of Munich, Germany.

ing a nucleus of scientists and engineers who are broadening the application of his principles.

EDVAC Retired After Serving Army for 11 Years

EDVAC, the U.S. Army's oldest operating computer and a forerunner of the gigantic computer industry, has been "honorably discharged" after 11 years of "faithful and distinguished service" at Aberdeen Proving Ground, Md.

EDVAC (Electronic Discrete Variable Automatic Computer) was turned off for the holidays on Dec. 19 and the final decision to retire it was made Jan. 2, 1963, by Ballistic Research Laboratories officials.

When EDVAC began operating in 1961, it was considered far superior to its predecessor, the ENIAC, the Army's grandpa of all computers, but it is now obsolete. ORDVAC (1952) and BRLESC (1962) will take over Aberdeen Proving Ground computing functions. (See April 1962 issue.)

EDVAC was constructed by the University of Pennsylvania under Ordnance Corps sponsorship. During most of its life it operated 24 hours a day, seven days a week, solving thousands of complex problems and saving countless valuable manhours.

The design features of EDVAC served as a model for almost all of the present business computers. EDVAC was smaller in size and had greater flexibility and better mathe-

Space Age 'Slave' Provides Atmospheric Measurements

A space age "slave" created by an Army Electronics Research and Development Activity scientist at White Sands Missile Range, N. Mex., is achieving more accurate atmospheric measurements up to 50 miles above the earth.

Alton A. Duff, assigned to the Fort Greely, Alaska, rocket firing station operated by the Army Electronics R&D Activity, recently received an Incentive Award check for \$300 for his electronic slave idea.

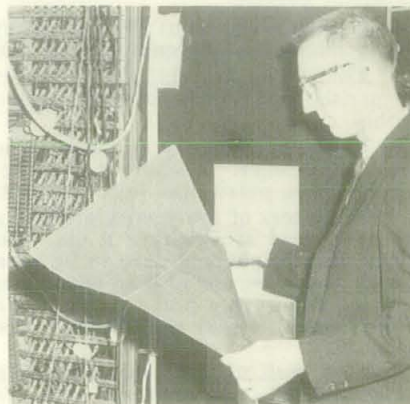
A ground measuring device (GMD) that accurately tracks a radio transmitter in a small meteorological rocket serves as the slave of a companion tracking radar. It positions the radar on the meteorological rocket during portions of flight which the radar finds difficulty in tracking. The radar is the primary source of data.

The GMD slave is particularly useful at remote locations such as Fort Greely, where high precision radars are not available. Remote stations in the global meteorological rocket network pioneered by the Electronics R&D Activity, it was stated, will be equipped with the slave device to gain more precise atmospheric data.

matical performance than ENIAC.

It employed the binary system of numeration, which was more suited to electronic circuits than the decimal system used by ENIAC. Finally, it incorporated duplicate circuitry for check purposes.

EDVAC, like BRL's other electronic computers, is credited with serving as an invaluable aid in the Laboratories' work to improve, through research, military materiel.



Chester W. Wallin, engineer in charge of EDVAC and BRLESC operations, scans EDVAC blueprints after shutting off electrical power for last time.

USAEFG Scientist Wins SARS Fellowship

William D. Ohmstede, micrometeorological research scientist at Fort Huachuca, Ariz., has won a Secretary of the Army Research and Study (SARS) Fellowship.

Presently with the Meteorology Department of the Electronic R&D Activity, U.S. Army Electronic Proving Ground, he is the first civilian employee at Fort Huachuca selected for a SARS Fellowship. He was interviewed in Washington last November by the Army Executive and Professional Development Committee.

The fellowship will enable him to work at the University of Wisconsin Department of Meteorology for a year on the development of a quantitative method for prediction of micrometeorological processes and their effects on the lower atmosphere.

Ohmstede came to Fort Huachuca in 1955 after two years as research geophysicist in a tropical meteorology project in Hawaii for the University of California. Previously an instructor at Oklahoma A&M College after earning B.A. and M.A. degrees in meteorology at UCLA, he is a World War II Army Air Corps veteran. He is a member of the American Meteorological Society, American Geophysi-

cal Union and the Association of the U.S. Army.

For his paper on "Solution of Non-Steady Soil Moisture Transfer" (See July 1962 issue, p. 19) at the 1962 biennial Army Science Conference, he was given a Certificate of Outstanding Achievement signed by Dr. Finn J. Larsen, Assistant Secretary of the Army (R&D) and Lt Gen Arthur J. Trudeau, then Army Chief of Research and Development.



William D. Ohmstede, micrometeorological research scientist at USAEFG, receives notice of Secretary of the Army Research and Study Fellowship from Commanding Officer Col William Hupalo as Mrs. Ohmstede observes.

Sending: An SOS for Society of Solid 'Squares'

(Continued from page 2)

Paul Revere: What do you mean—me ride through every Middlesex village and town? And in the middle of the night, yet. Why pick on me? Am I the only man in Boston with a horse?

Patrick Henry: Sure, I'm for liberty. First, last and always. But we've got to be a little realistic. We're a pretty small outfit. If we start pushing the British around someone is going to get hurt.

George Washington: Gentlemen, I am honored. But I do wish you would try someone else. Let's say, General Gates. I'm just getting things organized at Mount Vernon.

Benjamin Franklin: Who we really need, for Ambassador to France, is a young man. I'm 70 years old. It's time a new generation took over.

Arnold Toynbee, the famous historian, says that of 21 notable civilizations, 19 perished, not from external conquest, but from the evaporation of belief within.

Today, our country still has a choice. I believe it has already begun to make that choice. I believe it is going back to its old beliefs in such things as ideals, pride, patriotism, loyalty, devotion and even hard work.

The forces of conformity are still strong. Too many of us are still sitting it out instead of sweating it out. Too many of us haven't got the guts to stand up straight and dare to be square. Because the opposite of square is round, and being round is so much simpler. Responsibilities and problems roll off nice and easy. And we can just roll down the path without any bumps, being careful to stay in the middle, because that's where the most comfortable ruts are.

How shall we fight for personal independence? How shall we avoid the group poop, the vortex of mediocrity, the great nothingness of cynical sophistication and bored nonparticipation?

I suggest that we all join the SOS. The SOS is the Society of Squares. It doesn't exist, but it could. Not a leftwing organization. Not a rightwing organization. Just an organization with wings.

SCIENTIFIC CALENDAR

Part of the 1st Australian Conference on Electrochemistry, Sydney, Australia, Feb. 13-15.

Part II of the 1st Australian Conference on Electrochemistry, Hobart, Tasmania, Feb. 18-20.

1st Inter-American Conference on Radiochemistry, Montevideo, Uruguay, Feb. 19-22.

International Conference on Solid-State Circuits, Philadelphia, Feb. 20-22.

Annual Symposium on Fundamental Cancer Research, Houston, Tex., Feb. 20-22.

International Conference on Diffusion, Palm Springs, Calif., Feb. 24-27.

International Symposium on Unit Process in Hydrometallurgy, sponsored by the American Institute of Mining, Metallurgy & Petroleum Engineers, Dallas, Tex., Feb. 24-28.

2nd Underwater Physiology Symposium, sponsored by ONR, Washington, D.C., Feb. 25-26.

International Conference on the Physics of Fast Neutrons, sponsored by USARO-D, AEC and NAS-NRC, Houston, Tex., Feb. 26-28.

Symposium on Tolerance Limits of Toxic Substance in Industrial Atmospheres and in Biological Materials, Paris, France, Feb. (date undetermined).

14th Pittsburgh Conference on Analytical Chemistry & Applied Spectroscopy, Pittsburgh, Pa., Mar. 4-8.

Symposium on Chemical Engineering in Space Technology, sponsored by the American Institute of Chemical Engineers, New Orleans, Mar. 10-13.

High Pressure Research Symposium, Watervliet Arsenal, N.Y., Mar. 14-15.

2nd Bionics Symposium, sponsored by ASD, AFSC and Wright-Patterson AFB, Dayton, Ohio, Mar. 19-21.

Quantitative Spectroscopy at Elevated Temperatures & Selected Applications in Space Science, sponsored by AFOSR, AF-CRL, ARPA, NASA, Institute for Defense Analyses and ONR, Pasadena, Calif., Mar. 20-22.

Annual Technical Meeting of the Protective Coatings Division of The Chemical Institute of Canada, Toronto, Ontario, Canada, Mar. 21.

Annual Technical Meeting of the Protective Coatings Division of The Chemical Institute of Canada, Montreal, Quebec, Canada, Mar. 22.

2nd Latin American Medical Conference, Panama Canal Zone, Mar. 24-27.

1963 Army Operations Research Symposium, Durham, N.C., Mar. 26-28.

International Symposium on Photochemistry, sponsored by AFOSR, Rochester, N.Y., Mar. 27-29.

32nd Symposium on Shock, Vibration & Associated Environments, Albuquerque, N. Mex., Apr. 15-18.

Boron-Nitrogen Chemistry Symposium, Durham, N.C., Apr. 23-24.

Army Reassigns Officers

Secretary of the Army Cyrus R. Vance recently announced the reassignment of Maj Gen Louis V. Hightower, Deputy Commanding General, USARYIS/IX Corps, Ryukyu Islands, to Headquarters, U.S. Continental Army Command, Fort Monroe, Va.

Col Walter E. Brinker, Office of the Joint Chiefs of Staff, was reassigned to the Office of the Comptroller of the Army. He recently was nominated for promotion to brigadier general.

Army Gives Dr. Siple 2-Year Leave of Absence To Accept State Department Post in Australia

Dr. Paul A. Siple, U.S. Army Research Office Scientific Adviser and a highly honored leader in research and development activities for 17 of his 21 years as an Army employee, has accepted a State Department job.

Effective in May, the internationally acclaimed polar explorer, geographer and scientist will begin a new assignment as Scientific Attache to Australia and New Zealand.

The Army has approved a request for a 2-year leave of absence, recognizing a mutuality of interest with the State Department in developing scientific ties with the two nations.

Listing of the awards and citations from the Government, professional societies and honorary degrees from major educational institutions heaped upon Dr. Siple during his illustrious Army career would require considerable space. He is the recipient of the Department of Defense Distinguished Service Award and the Department of the Army Exceptional Civilian Service Award.

A recent book by Edna Yost, *Modern Americans in Science and Technology*, in the "Makers of Our Modern World" series, listed him among 13 of the Nation's most distinguished scientists whose work has been of profound significance. (See January 1963 issue, page 9.)

In his letter to Chief of Research and Development Lt Gen Dwight E. Beach requesting a leave of absence, Dr. Siple explained:

"This is a challenging assignment because it is a newly created job and both countries exhibit unusually high scientific qualities. These nations are among our most reliable friends and need more encouraging ties with the United States because of their important location on the globe."

The stage was set for his new State Department assignment in 1961 when he spent four months in Australia, New Zealand and India under the agency's cultural exchange American Specialists Program.

Subsequently he recommended that the United States explore the possibility of strengthening scientific liaison, leading to establishment of a U.S. Army Research and Development Office in Melbourne, Australia in August 1962.

During his many Antarctic expeditions Dr. Siple has been a frequent visitor to Australia and New Zealand. The latter government honored him by naming a portion of its Antarctic

territory "Siple Coast." The U.S. Board of Geographic Names also recognized his explorations by designating that "Mount Siple" be listed on Antarctic maps.

Since he was selected from 60,000 Boy Scouts for Admiral Byrd's first Antarctic expedition (1928-30), serving as a 20-year-old dog driver, biologist and naturalist, he has spent 4 winters and 10 summers there.

Dr. Siple did his undergraduate work at Allegheny College and received his Ph. D. in the field of geography at Clark University. He has directed many Army basic research programs in the environmental sciences and has done extensive research in climatology and climatic factors controlling building design.

Development of clothing and protective devices has won him a number of patents, and the now widely used "thermal boot" was perfected from his concept.

In his world travels he has visited all seven continents, and has authored several books and many scientific and magazine articles. His most recent book, *90° South*, is an account of the first year of occupation of the Geographic South Pole during the International Geophysical Year.

Civil Defense Establishes Test Center at Ft. Belvoir

The Protective Structures Development Center, established to increase the Nation's fund of knowledge about building shelters against nuclear attack, was opened recently at Fort Belvoir, Va.

Operated by the Office of Civil Defense through a joint Civil Defense Support Group, the Center is staffed by personnel from the U.S. Army Corps of Engineers and the Navy Bureau of Yards and Docks.

Assistant Secretary of Defense (Civil Defense) Stuart L. Pittman said the new facility will be used to test new design and building ideas, and that it can be used by manufacturers to erect shelters and components for evaluation. Architects and engineers also are urged to use the Center.

Facilities include two concrete shelters, capable of holding 1,000 and 2,000 persons, respectively. A Radiation Test Facility, providing a simulated field of radioactive fallout, can be used for testing materials and structural design of various shelters.



By Ralph G. H. Siu

ADVICE FROM A SLAVE. Planning seems to be the order of the day. Feverish attempts are being made to "etch plans in marble" or "set it in concrete." Our Latin consultant, Dr. Marion Sulzberger, reminded me of a piece of timely advice from Publilius Syrus, a Roman slave in 45 B.C.:

Malum est consilium quod mutari non potest (Free translation: Bad is the plan not capable of change).

THE 9-POINT PROBATIONAL TEST. In the employment of new personnel, Civil Service regulations provide for a probationary period. Here is how Confucius might have viewed the evaluation process.

"Man's mind is more treacherous than mountains and rivers, and more difficult to know than the sky. For with the sky you know what to expect in respect of the coming of spring, summer, autumn and winter, and the alternation of day and night. But man hides his character behind an inscrutable appearance.

"There are those who appear tame and self-effacing, but conceal a terrible pride. There are those who have some special ability but appear to be stupid. There are those who are compliant and yielding but always get their objective. Some are hard outside but soft inside, and some are slow without but impatient within....

"Therefore a gentleman sends a man to a distant mission in order to test his loyalty. He employs him nearby in order to observe his manners. He gives him a lot to do in order to judge his ability. He suddenly puts a question to him in order to test his knowledge and makes a commitment with him under difficult circumstances to test his ability to live up to his word. He trusts him with money in order to test his heart, and announces to him the coming of a crisis to test his integrity. He makes him drunk in order to see the inside of his character, and puts him in female company to see his attitude toward women.

"Submitted to these nine tests, a fool always reveals himself."

* Cf. Lin Yutang 1948, *Wisdom of Laotze*, pp 250-251.

African Manpower Specialists, Educators Learn About APRO Personnel Measurement Program



Dr. J. E. Uhlaner, Director, Research Laboratories, APRO, briefs African manpower and education leaders on the Army personnel measurement program. Clockwise around the table (for heads showing): Y. B. Quansah and Cecil A. Nelson, Ghana; C. I. Berepiki and A. O. Ozigi, Nigeria; Dr. Uhlaner; A. U. Usoro, Nigeria; Cecelia Quaynor, Ghana; F. U. Madike and S. C. Aleyideino, Nigeria; A. T. Davies, Liberia.

Manpower specialists and educators from the African nations of Ghana, Liberia and Nigeria recently visited the U.S. Army Personnel Research Office (APRO) in Washington, D.C., for a briefing on personnel research.

Members of the group are taking courses at the University of Pittsburgh in test construction, statistics and psychometrics. The program is sponsored by the Agency for International Services, American Institute for Research.

Welcomed by Col Charles S. Gersoni, APRO Commander, the 13 visitors listened to Dr. J. E. Uhlaner, Director of APRO's five research laboratories, discuss the overall program related to personnel research.

Dr. William H. Helme, Senior Task Leader of the New Classification

Techniques Task of the Military Selection Research Laboratory, described methodology and development of the Army Classification Battery.

Dr. Robert F. Boldt, Senior Task Leader of the Future Combat Task, Combat Systems Research Laboratory, discussed "Manpower Allocation Problems."

Louis P. Willemin, Task Leader of the Officer Prediction Task, Behavioral Evaluation Research Laboratory, explained the procedures used to resolve the measurement problems in noncommissioned officer evaluation and in developing a test battery for differential officer prediction.

The visitors represented the Manpower Unit of the State Planning Commission in Ghana, the Department of Public Instruction in Liberia, and Ministry of Education in Nigeria.

USMA Opens Computer Center to Train Cadets

A computer center designed to serve all academic departments and research activities as well as to train instructors and cadets recently went into operation at the U.S. Military Academy, West Point, N.Y.

Officers and cadets are being trained in use of the computer, and training will continue throughout the cadets' four years at the Academy.

Installed in the center's 200-seat main room is the General Electric "GE-225" general purpose digital computer. It is located so that all

present can observe the operation of its central processor, console typewriter, card reader, card punch, line printer and four magnetic tape transports.

A closed-circuit projection television giving large-screen projection of the finer details of computer operation and problem solution will supplement movie and slide projection equipment as training aids.

A graphic plotting device is scheduled for early installation to supplement the computer's printer-plotting capabilities.

Bell Award Praises Work Of Army Aviation Center

Assistance in developing rotary-wing aircraft recently earned the U.S. Army Aviation Center, Fort Rucker, Ala., the 1962 Grover E. Bell Award. In 1960 the award went to the U.S. Army Aviation School Combat Development Office.

Brig Gen Robert R. Williams, Commanding General of the Center, accepted the award consisting of a certificate, medal and \$250 cash grant. Harvey Gaylord, President of Textron's Bell Aerospace Corp., made the presentation at the Helicopter Association of America Honors Night Dinner at Palo Alto, Calif.

The certificate states that the sixth Grover E. Bell Award is presented "for development of the armed helicopter concept introduced to service by the UH-1B during 1962."

The late Lawrence D. Bell established the annual award "to the person or persons making an outstanding contribution to helicopter development during the preceding calendar year in the United States."

Key Staff Officers Named For Medical Publication

Brig Gen Frank E. Wilson and Brig Gen Amos R. Koontz have been named executive director and editor, respectively, of *Military Medicine*, official journal of the Association of Military Surgeons of the United States. Published monthly, it is devoted to the interests and promotion of military medical science.

General Wilson, an active medical Army Reservist and Commanding Officer of the 805th Hospital Center, was formerly Executive Vice President of the Joint Blood Council in Washington, D.C., and National Medical Director of the American Red Cross. His medical administrative experience includes legislative representation for the American Medical Association.

General Koontz, of Baltimore, is a past president of the Association, a nationally known surgeon, and author of nearly 300 articles in surgical textbooks and journals. He is retired from the Maryland National Guard.

The Association of Military Surgeons was organized in 1891 and incorporated by the U.S. Congress in 1903, becoming the first military service association to receive a congressional charter.

Constituent services are the Army, Navy, Air Force, Public Health Service, Veterans Administration, Military Reserves and National Guard.

Rear Adm Calvin B. Galloway, USN, is the newly elected president.

Rocket Society Hears Talk On Army Safety Precautions In Propellants Manufacture

Nearly 700 members of the American Rocket Society assembled in Philadelphia for the Fourth Annual Solid Propellant Rocket Conference, Jan. 30-Feb. 1, heard a report on Army research in safety precautions for manufacturing propellants.

Dr. John Erway, Chief of the Propellants and Explosives for Missiles and Rockets Branch, Headquarters of the U.S. Army Munitions Command, Dover, N.J., made the presentation. Titled "Safety in Solid Rocket Propellant Plants," the talk represented the first effort of the Society to devote a portion of the annual meeting to safety in manufacturing rocket propellants.

Dr. Erway's talk outlined the safety procedures presently employed by the Munitions Command in propellant manufacture. Continual changes in composition and characteristics of explosives necessitate, he said, a constant review of safety practices, with emphasis on improved procedures.

Picatinny Arsenal, which is the site of Munitions Command Headquarters, has national research responsibility in the fields of both liquid and solid propellants. Examples of Army missiles which rely on solid propellant include Jupiter, Pershing, Honest John, Sergeant, LaCrosse and the Nike family.

Nike Hercules Shelter

An air-inflated tent, designed to provide protection to soldiers performing maintenance and checkout operations on the Nike Hercules missile, has been developed at the Quartermaster Research and Engineering Command, Natick, Mass.

Inflated by means of a high-volume, low-pressure blower, the structure can be erected by six men in 80 minutes. This includes installation of the tent's ground anchoring system.

The experimental shelter can be struck and readied for shipment by six men in an hour. A manually activated quick-release device permits striking the tent in about three seconds for rapid missile launching.

Army technician (top right) uses manually activated quick-release device to strike experimental shelter, exposing (below) Nike Hercules ready for rapid launching.

Mobility Leader Emphasizes Creative Thinking

Maj Gen Alden K. Sibley described the period in which we are living as the "Golden Age of Mobility—our challenge to think" in speaking recently to officer students at the U.S. Army Transportation School, Fort Eustis, Va.

The Commanding General of the U.S. Army Mobility Command stressed the need for more brainpower and more basic research in the Army. To emphasize the importance of creative thinking in research and development in the struggle to achieve and maintain supremacy over the potential aggressor, he said:

"Young Americans must learn to think, or else learn Russian.

"The brainpower we have to have today is a very real problem to every officer in the Transportation Corps. It breaks the gap between the scientist and the military mind."

The general said there is a need for more soldiers who can "think in scientific terms and then translate these terms to others—we need more Ph.D.s in the Army. We need to modify career management plans when we have young, bright, capable officers who may have the opportunity to get doctorates, and give them this opportunity.

"Today we have a real need for strategic guidance. We have come to

the end of the last era of the ascendancy of firepower in the military history of the world. . . . History in the future must be based on strategic planning, strategic mobility and the ascendancy of mobility."

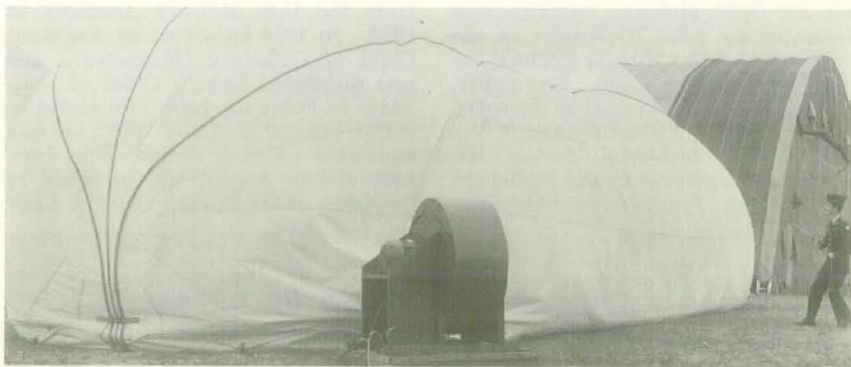
600 Expected to Attend Frequency Control Meet

The Seventeenth Annual Frequency Control Symposium, sponsored by the U.S. Army Electronics Research and Development Laboratory, Fort Monmouth, will be held at Atlantic City, N.J., May 27-29.

Conducted by the Laboratory's Solid State and Frequency Control Division, the Symposium is generally recognized as the world's top annual meeting concerned with frequency control and related subjects.

About 30 technical papers will be presented on such subjects as piezoelectric resonators, fundamental properties of quartz, crystal oscillators and filters, masers, gas cells, atomic beam devices and applications of atomic frequency standards. A general discussion period is scheduled on quartz crystals and circuitry.

The meeting will be unclassified and open to the general public. More than 600 representatives of industry and government agencies from all parts of the Free World will attend.



Technical Papers Report Watervliet Arsenal Tasks

Three papers on basic research and weapons design prepared by personnel in the Watervliet Arsenal Research and Engineering Division, Watervliet, N.Y., were presented at recent meetings of national scientific societies.

"Pressure Effect on Vacancy Formation in Gold," prepared by Dr. Rudolf Huebner, former Chief of the Solid-state Physics Laboratory, and physicist Clark G. Homan, was presented at the American Physical Society meeting. The paper described research on the effect of metallic imperfections in weapons manufacture.

Recent Arsenal extensions of the autofrettage process in cannon manufacture, described in "Fatigue Characteristics of Open-End, Thick-Walled Cylinders Under Cyclic Internal Pressure," was presented to the American Society of Mechanical Engineers in New York City.

The paper was prepared by Thomas E. Davidson, Chief of the Physical and Mechanical Metallurgical Lab, Arsenal consultant Dr. Raymond Eisenstadt of Union College, Schenectady, N.Y., and Arsenal mechanical engineer Albert N. Reiner.

A study of the modern Army concept of mounting large caliber weapons on light airborne vehicles was presented by John D. Waugh at the convention of the Human Factors Society in New York City. The paper, "Firing Shock Evaluation in Armored Reconnaissance Airborne-Assault Vehicles," was developed during Mr. Waugh's assignment to the Shillelagh Development Program at Aberdeen Proving Ground, Md.

DoD, NASA Announce New Policy on Canaveral

The Department of Defense and the National Aeronautics and Space Administration announced on Jan. 22 a new agreement on management responsibilities for operations in the Cape Canaveral area.

Signed by Defense Secretary Robert S. McNamara and NASA Administrator James E. Webb, the agreement lets the DoD continue as the single manager of the Atlantic Missile Range, extending from the Cape to the Indian Ocean.

Under DoD authority, the Air Force will continue as the host agency at the existing 15,000-acre Cape Canaveral launch area.

WRAMC Annex Marks 20 Years of Medical Service

The Forest Glen Section of the Walter Reed Army Medical Center (WRAMC), Washington, D.C., in January completed its 20th year as a center of medical research and a convalescent hospital.

Tracing its origins to the late 19th century when the grounds housed the National Park College for young ladies, the Glen today is the home of world famous medical laboratories and research activities.

Among the major activities located at the annex is the Army Audiology

and Speech Center, holding the remarkable record of returning to full duty 99.5 percent of those receiving rehabilitation. Another is the Army Prosthetics Research Laboratory, which has achieved a whole new concept of amputee rehabilitation and restoration (see October 1961 issue of this publication). Others are the Armed Forces Pest Control Board, the Historical Unit of the Army Medical Service and, since it was established in 1961, the Diamond Ordnance Radiation Facility.

General Bigelow Sets Goal In Ordnance Career Course

Maj Gen Horace F. Bigelow, Assistant Deputy Chief for Logistics (Programs and Budget), was the principal speaker at the opening of the Career Officer Course (Class-22) at the U.S. Army Ordnance School in mid-January.

Speaking to more than 110 student career officers at Aberdeen Proving Ground, Md., General Bigelow said the course aims "to give you the foundation upon which you can build. . . . I don't think anyone really has ever qualified fully for the Military Occupational Specialty 4512, Ordnance Officer. I think it's a pretty good objective, so I commend it to you as an objective."

General Bigelow was graduated from the U.S. Military Academy in 1932. In 1958 he served as Assistant Chief of Ordnance (Manpower) and was appointed Deputy Chief of Ordnance in February 1960. Promoted to major general in March 1960, he was appointed Chief of Ordnance in June 1962 and in August was assigned to the Office of the Deputy Chief of Staff for Logistics.

Bill in Congress Lists Missile, Aircraft Funds

The Army portion of a \$15,358,691,000 authorization bill introduced in Congress in January for procurement of aircraft, missiles and ships for the Armed Forces in Fiscal Year 1964 is \$1,760,849,000.

The funds requested for the Army would provide \$522,100,000 for the procurement of aircraft and \$580,000,000 for missiles, plus \$82,148,000 for aircraft research, development, test and evaluation (RDT&E) and \$576,601,000 for missiles.

As presented, the bill would give the Air Force \$3,559,000,000 for aircraft procurement and \$2,177,000,000 for missiles, plus \$322,986,000 for RDT&E of aircraft and \$1,060,132,000 for RDT&E of missiles.

The Navy and Marine Corps would receive \$1,958,700,000 for aircraft procurement and \$14,700,000 for missiles, plus \$204,183,000 for aircraft RDT&E and \$590,133,000 for missiles.

The arms bill was introduced by Representative Carl Vinson, Chairman, House Armed Services Committee.

by DoD and NASA in their own behalf regardless of location.

Certain fundamental range functions will continue to be the responsibility of DoD in both areas. These include scheduling, frequency control and analyses, flight safety, air traffic coordination, sea surveillance, search and sea recovery, underwater salvage, downrange airlift, downrange station operation, and logistics and Port Canaveral operations.

The agreement provides that NASA Launch Operations Center, headed by Dr. Kurt Debus, will be the focal point for all NASA relations with the Atlantic Missile Range. AMR is operated by the Air Force Missile Test Center under the command of U.S. Air Force Maj Gen Leighton I. Davis.



The ladies whose knowledge, efficiency and devotion to their jobs help to smooth off many of the rough edges of tempers in meeting "crash" deadlines had their day when U.S. Army Research Office awards were made recently.

Outstanding Performance ratings and Sustained Superior Performance cash awards went to Mrs. Cora F. Watson, Mrs. Irene A. Dunn and Mrs. Jeanette H. Merritt. Mrs. Dorothy R. Ferguson received a Sustained Superior Performance award and Mrs. Margaret F. Row was honored with a Certificate of Achievement and an Outstanding Performance rating.

Mrs. Watson is an executive secretary to the Deputy and Scientific Director of Army Research, Dr. Richard A. Weiss. Mrs. Row serves in a similar capacity in the Office of the Assistant Director, Col C. B. Hazeltine, Jr. Mrs. Dunn, Mrs. Ferguson and Mrs. Merritt are chief clerks in the Environmental Sciences, Physical Sciences, and Life Sciences Divisions.

Employees of the U.S. Army Mobility Command Research and Development Laboratories (USAERDL), Fort Belvoir, Va., accorded honors included four recipients of both Outstanding and Sustained Superior Performance awards: Mrs. Marie Everett, Executive Officer, \$150; Donald G. Hubbard, Evaluation Branch, \$250; Eugene Holmes, Supply and Property Accounting Branch and John A. Brown, Equipment Maintenance Branch, \$100.

Mrs. Katherine E. Commer, Military Planning and Control Branch and Carl M. Thomas, Jr., Warfare Vision Branch, received \$150 awards for Sustained Superior Performance (SSP). Wallace L. Oliver, Environmental Evaluation Branch, and Frank V. Dungan, Equipment Maintenance Branch, respectively received \$150 and \$100 for SSP awards.

Three employees of the Facilities Planning and Maintenance Branch who received SSP awards are William H. Deavers, \$200, and Jack C. Corkins and Leonard E. Johnson, \$150.

1962 was a banner year for 214 USAERDL employees who received awards aggregating \$20,750 in cash. The recipients are employed by USAERDL, the Nuclear Power Field Office and the U.S. Army Engineer Geodesy, Intelligence and Mapping Research and Development Agency.

Former Enlisted Scientist Wins SARS Fellowship

Dr. Edward J. Poziomek, a research scientist at the U.S. Army Chemical Research and Development Laboratory, Edgewood Arsenal, Md., was recently awarded a Secretary of the Army Research and Study Fellowship.

A former soldier who doffed his uniform to continue as a civilian employee at the CRDL, he advanced under the Army Enlisted Scientific and Professional Program, studying nights and weekends for more than three years to earn his Ph. D. degree. (See page 18, September 1961 issue of this publication.)

Cited in the Fellowship award as a young man of "unusual competence in his technical and administrative ability, creative thinking and leadership," Dr. Poziomek also was honored with a Certificate of Achievement.

Identical certificates were presented by Col James O. Hebbeler, CRDL Commander, to Dr. David Kramer, Chief of the Detection Research Branch, and to Bernard Fromm, Chief

of the Detection Methods and Materials Section.

Findings of the three men, as reported in a joint paper titled "Chemical Approaches to the Development of a Personal Expendable Detector for Chemical Agents," were termed in the citation as a "commendable contribution to science and the furtherance of the U.S. Army research and development program." The paper won a \$300 honorarium at the 1962 Army Science Conference last June.

The SARS Fellowship enables Dr. Poziomek to study for a year under Dr. Edward M. Kosower in the Chemistry Department of the State University of New York. The study pertains to "Establishment of Theoretic Principles on Which to Design Organic Detection Reactions for Air Pollutants."

A graduate from Rensselaer Polytechnic Institute, Troy, N.Y., Dr. Poziomek received his masters and Ph. D. degrees in chemistry from the University of Delaware.

Prosthetics Researcher Wins Meritorious Award

Dr. Fred Leonard, Scientific Director of the U.S. Army Prosthetics Research Laboratory, Walter Reed Army Medical Center, was awarded a Department of the Army Meritorious Civilian Service Award Jan. 10.

The award was made on behalf of the Secretary of the Army by Brig Gen Robert E. Blount, MC, Commanding General, U.S. Army Medical Research and Development Command.

Dr. Leonard was commended for directing research in materials suitable for a variety of internal body uses, such as vascular prosthesis, and smooth-surfaced porous laminates which have greatly enhanced the comfort of prosthetic devices.

A native of Brooklyn, N.Y., he earned a B.S. degree from the University of Arkansas in 1938 and M.S. and Ph. D. degrees in polymer chemistry from the Polytechnic Institute of Brooklyn in 1942 and 1947.

In 1948 he joined the U.S. Army Prosthetics Research Laboratory as Chief of the Resin Section, and later was promoted to Chief of the Plastics Development Branch before becoming Scientific Director in 1961.

Dr. Leonard serves additionally as consultant in plastics to the Committee on Prosthetics Research and Development, and as a representative to The Surgeon General, U.S. Army on Government and civilian committees

concerned with the medical application of materials.

The U.S. Army Prosthetics Research Laboratory was established in September 1945 to conduct fundamental research, applied research, development, testing and training in the field of prosthetic and orthopedic appliances and to assist other medical research activities by the fabrication of plastic devices as required.

2 New PLASTEC Reports Sold By Department of Commerce

The Plastic Technical Evaluation Center (PLASTEC) at the Army's Picatinny Arsenal, Dover, N.J., has published Reports 11 and 12.

More than 400 papers on plastic materials and related technology presented at technical conferences within a 1-year period ending February 1962 are listed and indexed according to subject in PLASTEC report 11. A numerical code system indicates information each article contains.

Report 12 outlines the various space environmental factors and their effects on plastics and related materials. Among the factors discussed are ultraviolet radiation, high vacuum, temperature extremes and micro-meteorite erosion.

Copies of PLASTEC reports can be purchased from the Office of Technical Services, Department of Commerce, Washington 25, D.C.

Army Medic Discusses Tularemia Control Advances

U.S. Army research on tularemia, its history and development of vaccines were reported at a recent MEND (Medical Education for National Defense) Symposium on Infectious Disease in Biological Warfare and Global Medicine at Walter Reed Army Institute of Research.

Maj William D. Sawyer of the U.S. Army Medical Unit at Fort Detrick, Md., described the extensive investigations of tularemia conducted in the Army Biological Laboratories and by the Walter Reed Army Medical Unit.

"Tularemia has been called an American disease," he said. "It is probably the first disease to have been recognized originally and to have its etiology determined in our country.

"Subsequently the disease assumed international stature and now is of

relatively little medical concern in the United States in comparison with other areas of the world."

Because the disease possesses certain characteristics desirable in candidate biological weapons agents, he explained, it has been subject to continuing Army studies directed toward defensive measures.

Epidemiologically, it was stated, man is an accidental host of tularemia and is infected only when he comes into direct contact with naturally infected species or vectors. He listed five bird species and 23 mammals as vertebrate hosts known to be naturally infected with the disease *P. tularensis* and their ectoparasites (deerflies, wood ticks, etc.) capable of transmitting the disease.

In discussing laboratory infections by aerosols, the method that most

likely would be employed in biological warfare, Maj Sawyer indicated that a typhoidal type disease results.

Investigations by the U.S. Army have established that nonviable vaccines do not satisfactorily immunize, he said. Credit was given to Dr. Henry T. Eigelsbach and his associates at Fort Detrick for success in "improving the immunogenicity of types of the bacteria." As a result, a vaccine now is available which "affords protection from virulent challenge."

The routine use of the new vaccine, it was reported, has been associated with reduction of laboratory infections due to tularemia from 15 to 20 a year to zero in experiments at the Army Biological Laboratories.

First recognized in the United States as a disease in rodents in 1911, in humans in 1919, and in Japan as a clinical illness in 1925, tularemia may have existed in the U.S. prior to the turn of the century, Maj Sawyer said. A similar disease was described in Japan in 1837.

U.S. Army research, he stated, has advanced so that an adequate defense can be provided against use of *P. tularensis* as a biological agent. His closing statement was:

"Adequate immunizing material is available, as is effective therapy and a rational basis for its use."

(As reported in the July 1962 issue of this publication, Dr. H. T. Eigelsbach presented a \$500 award-winning paper on "Live and Killed Tularemia Vaccines: Evaluation in Animals and Man" at the 1962 U.S. Army Science Conference. The paper was coauthored with Dr. Sam Saslow, Dr. F. R. McCrumb and Col W. D. Tigertt. Dr. Eigelsbach is also mentioned in the June 1962 issue of the *Newsmagazine*, p. 14, in connection with development of an inhalant-type live vaccine for the immunization of man against tularemia.)

Tank Does 'Twist' at SAE Show

A 90-minute "Mobility Rodeo" highlighted the largest congress and exposition in the history of the Society of Automotive Engineers (SAE) in Detroit, Mich. The show, seen by about 3,000 people, was sponsored by the SAE and the U.S. Army Mobility Command.

Star of the show was a 25-ton Army tank which "danced the twist" in a display of its revolutionary hydronematic suspension system (see March 1962, page 9, of this publication). By turning a lever the tank driver can raise or lower the sides of the tank's hull.

Enlisted Engineer Heads Test-Missile Projects

A young soldier-engineer at the U.S. Army Missile Command, Redstone Arsenal, Ala., has headed two successful test-missile projects from concept stages through flight tests during a 15-month military career.

Sp/4 William J. Ketchum, Riverside, Calif., is one of the few soldiers stationed at the Arsenal who has directed the design, fabrication and flight testing of a test vehicle. He said the flights were made to study effects high accelerations have on solid propellant design.

Personnel of the Test Management Branch of the Test and Evaluation Laboratory, Directorate of Research and Development, were given an outline of the requirements for testing the new solid propellants. They developed the test vehicles solely for these tests.

Ketchum and other laboratory personnel designed the fins, telemetry requirements, destruct mechanism and the launcher for the 6-foot missiles.

The 26-year-old soldier holds a B.S. degree in aeronautical engineering from Northrop Institute of Technology and did graduate work at the University of Colorado.

Pre-service experience as a test engineer includes 3½ years with Astronautics Division of General Dynamics in San Diego, Calif., where he worked on the Atlas ICBM. He has extensive experience in the field of fluid dynamics in liquid propellant rocket



SP/4 William J. Ketchum

propulsion systems.

Discussing the success of the recent test shots, he said the vehicles' accelerations came within five percent of the calculated value and achieved 90 percent of the propellant burning time. He emphasized that for test purposes a burning time of 40-50 percent was all that was required to provide sufficient flight telemetry data.

After a test, either static or range firing, he gathers the information for a quick evaluation by laboratory scientists. As test engineer, he writes a firing result report within 48 hours and compiles a complete report when all the results have been evaluated.

Presently he is test engineer for full-scale tests of Zeus propulsion units.

General Waite Discusses Ordnance Officer's Role

General Frederick G. Waite (USA, Ret.) discussed the "Role of an Army Ordnance Officer" at a recent meeting of more than 200 U.S. and foreign Ordnance officers at Aberdeen Proving Ground, Md.

Introduced by Brig Gen David W. Hiester, commanding the U.S. Army Ordnance Center and School at Aberdeen, the guest speaker emphasized the essentiality of good management with respect to materiel requirements of a modern Army, and the depth of knowledge required for decisions.

"Korea was and is the best training an Ordnance Corps officer can have," he said, as a proving ground for the "selective stockage" concept designed to insure a proper stockpile of Ordnance supplies within individual units. He served 15 months with the Eighth U.S. Army in Korea as an Ordnance officer and later with the United Nations Command in the Far East in 1958-59.

"Do you look upon your profession with the awe that perhaps a doctor or lawyer would? If so, you are facing in the right direction," he said. In his 90-minute address, he used 35 mm. color slides to illustrate the Ordnance Corps mission, problems involved and how an Ordnance officer can meet them.

General Waite served as commander of the Letterkenny Ordnance Depot, the largest distribution depot of the Ordnance Corps, in 1957.

Pentagon Marks 20 Years as DoD Operations Center

A building scarcely less world famous than the Taj Mahal, and housing within its massive confines from 8 a.m. to 5 p.m. each day more people than comprise many an important city, marked its 20th anniversary in January.

The Pentagon in Washington, D.C., daily receives and disgorge some 27,000 military and civilian personnel of the U.S. Armed Forces. Sometimes, and quite often with questionable facetiousness, it is referred to as the "military's 5-sided monster." Others have termed it, as is properly its due, a "marvel of visionary planning," as modern now as when it was built.

Situated on what at one time was called "Hell's Bottom," and has since been transformed into some 200 acres of beautiful lawn, trees and shrubbery, the Pentagon competes ably as a tourist attraction with the national

Medical Research Results Reported at Seminars

"A Procedure to Evaluate Experimental Wound Healing" and "Studies on the Metabolic Function of Vitamin E in the Rat" were discussed at recent staff seminars at the Walter Reed Army Institute of Research (WRAIR), Washington, D.C.

Capt Costan W. Berard, Chief of Surgical Metabolism and Pathology, Division of Basic Surgical Research, analyzed the dynamics of wound healing of "paramount significance to the surgery of trauma" and especially important in military medical practice.

Investigations into the mechanisms involved in wound healing have been limited, he said, by the lack of a standard test which in itself can both assess the state of local healing and quantitate degrees of abnormality. A procedure developed at WRAIR attempts to fill this need by a threefold approach using physical, biochemical and histopathologic methods.

Dr. John F. Prudden, Department of Surgery, Columbia University College of Physicians and Surgeons, moderated discussion that followed.

Dr. Lawrence M. Corwin, Department of Biological Chemistry, Division of Biochemistry, spoke on the studies of vitamin E in rats. He stated that despite several well-established syndromes such as liver and heart necrosis, muscular dystrophy and resorption sterility resulting from a vitamin E deficiency, little is known of the nutritional significance of the metabolic role of this vitamin.

He discussed the role of tocopherol in protecting sulfhydryl groups from an inhibitory factor in cellular microcosms and showed that this function is not related to other functional roles of vitamin E.

Dr. Walter Mertz, Supervisory Research Biochemist in the Department of Biological Chemistry, led the group discussion.

The WRAIR Professional Staff Seminars are open to all persons interested in medical research. They are held in Sternberg Auditorium, Walter Reed Army Medical Center, Washington, D.C., at 3 p.m.

Seminars scheduled through May 1963 include:

- "Experimental Analysis of Emotional Behavior," Maj J. V. Brady, Chief, Department of Experimental Psychology, Division of Neuropsychiatry, Feb. 28.

- "The Absorption and Metabolism of Iron," Col W. H. Crosby, Director, Division of Medicine, Mar. 21.

- "A Cellular Approach to the Problem of the Pathogenesis of the Acute Radiation Syndrome," Dr. A. D. Glinos, Chief, Department of Cellular Physiology, Division of Basic Surgical Research, Apr. 25.

- "Experimental Shock Following Hemorrhage, Trauma and Endotoxin: Attempts to Modify the Lethal Response," Dr. Albert Einheber, Chief, Department of Germfree Research, Basic Surgical Research, May 29.

NAS Unit Plans Conference To Discuss Foam Plastics

A conference on the state-of-the-art of foam plastics is scheduled Apr. 22-23 at the U.S. Army Quartermaster Research and Engineering Command, Natick, Mass. The meeting is sponsored by the National Academy of Sciences-National Research Council.

Approximately 400 representatives from the Department of Defense, National Aeronautics and Space Administration and industry will attend.

The program will cover the areas of foamed plastics application and requirements, the physics and chemistry of foam and foam-making processes.

The success of such developments as the "buildings in barrels" (see March and April 1962 issues of this publication) has spurred military interest in foam plastics as an answer to the problems of logistics for construction in remote areas.

A paper on Army requirements in foam plastics will be presented by Dr. Bruce S. Fisher, Physical Sciences Division, U.S. Army Research Office.

AEC-Army Nuclear Power Program Tests ML-1 Mobile Low-Power Plant

Prototype testing of the world's smallest nuclear electrical power plant, the mobile ML-1, will be resumed this month under the joint Atomic Energy Commission-U.S. Army Nuclear Power Program.

The planned series of tests, initiated in April 1961, provides for exhaustive investigations aimed at procurement of a model that will satisfactorily meet field Army needs by 1966.

A significant milestone toward that goal was marked Sept. 21, 1962, when energy from the ML-1 was successfully converted into electricity for the first time at the Atomic Energy Commission's National Reactor Testing Station in Idaho.

Developed under the AEC-Army Nuclear Power Program, the ML-1 is the smallest and the first mobile unit of a family of compact nuclear power plants designed for remote area or field army use. All of the plants can be transported by tractor trailer units, air, ship, barge or railroad car.

The ML-1 reactor is the first to be coupled directly to a closed-cycle, gas-driven, turbo-generator unit. Operating temperature of 1200° F. is the hottest achieved to date in any operational nuclear reactor plant, an official assigned to the program said.

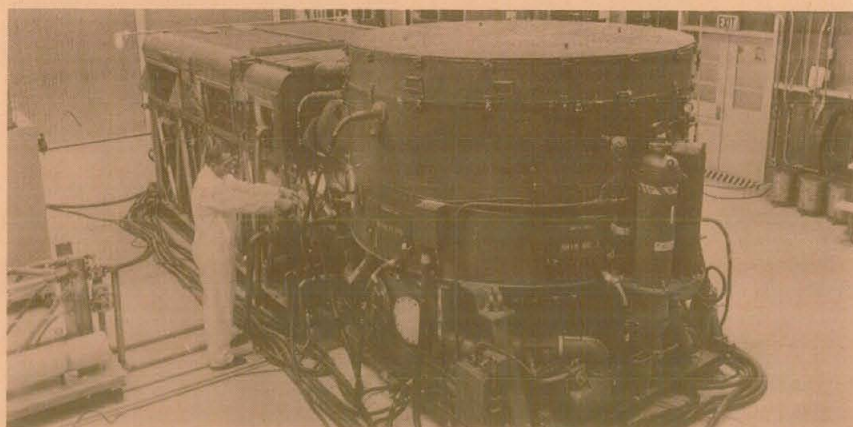
Much larger units developed under the joint program—two stationary and three portable plants—are in operation in such isolated places as Camp Century in Greenland, in Alaska, and at McMurdo Sound, Antarctica. A large floating nuclear power plant, the MH-1A, is scheduled for construction this year. (See page 36, January 1963 issue.)

Math Center Changes Dates Of Seminar to April 22-24

A change in dates for one of the seminars offered in the 1963 program has been announced by the U.S. Army Mathematics Research Center. The "Non-linear Integral Equations and Applications" seminars will be held Apr. 22-24.

Attendance at the seminars is by invitation only. Requests for invitations should be accompanied by a statement on the applicant's position and qualifications, and addressed to Dr. Rudolph E. Langer, Director, Mathematics Research Center—U.S. Army, University of Wisconsin, Madison 6, Wis.

A tentative list of courses scheduled by the Center for this year can be found on page 6 of the January issue of this publication.



ML-1 mobile, low-power nuclear plant.

The ML-1 will be used as a primary power source at field installations requiring 300-500 kilowatts, such as operation centers, field army air defenses, missile launch control centers, airheads, command and control centers, and logistic complexes.

Because of logistical advantages, mobile plants similar to the ML-1 will permit establishment of bases at remote areas which might not prove practical if they were dependent upon constant resupply of fuel oil. A conventional diesel plant with power output equivalent to the ML-1 would weigh about 20 tons and consume about four tons of fuel oil a day.

The nuclear core in the ML-1 offers a startling comparison as applied to the problem of Army logistics. The estimated 10,000-hour life of the core is equivalent in power output to about 400,000 gallons (1600 tons) of oil.

The prototype of the ML-1 consists of three individually shock-mounted packages—a 15-ton reactor, a 15-ton power conversion unit, and a 2½-ton control room. Two packages, weighing six tons, contain auxiliary subsystems used in startup and shutdown; they also accommodate storage reels for control cables.

Nitrogen, at 320 pounds per square inch pressure, passes through the reactor core. Heated from 800° F. to 1200° F., the nitrogen expands to drive the turbine at approximately 22,000 r.p.m.

Prior to returning to the reactor to repeat this process, the gas is compressed from 120 to 320 pounds per square inch in the compressor powered by the turbine. Just prior to entering the reactor, the gas is heated from 350 to 800° F. in the recuperator.

An electric generator driven by the

turbine compressor through a gear box reduces the shaft speed to 3,600 r.p.m. The power plant is rated to produce 330 kilowatts of electric power at a temperature of 100° F.

The reactor is a heterogeneous water-moderated type, with fuel elements containing uranium dioxide fabricated in the shape of a hollow tube. The nitrogen gas flows through 61 fuel elements, thereby cooling them and carrying off the heat to operate the turbine. The rate of fission is controlled by six pairs of neutron-absorbing semaphore blades which are inserted into the reactor to shut it down.

During operations, the control cab is located outside of the 500-foot radiation exclusion radius. The control cab is a weather-tight shelter provided with integral air conditioning and heating units. Sufficient biological shielding has been placed around the core to permit displacement of the reactor 24 hours after shut-down.

Development of the ML-1 reactor system was initiated in 1956 after studies conducted by the AEC and the Army established the feasibility of such an advanced system. A reactor experiment and a test of power conversion equipment followed.

The AEC proceeded with the construction of an experimental facility at the National Reactor Testing Station in Idaho, called the Gas-Cooled Reactor Experiment. Meanwhile, the Army constructed a test facility for the power conversion equipment, called the Gas Turbine Test Facility, located at Fort Belvoir, Va.

Knowledge gained in the design and operation of these two facilities provided sufficient data to make possible the design and fabrication of the ML-1 prototype.