



# ARMY RESEARCH AND DEVELOPMENT



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## Defense Directive States Policies on Technical Information

### Army Regulation Stresses Materiel Reliability

Army-wide major emphasis on reliability of weapons systems and equipment during the research and development cycle is prescribed in a forthcoming Army Regulation implementing Department of Defense policies.

Scheduled to come off the press for distribution early in February, AR 705-25, titled "Research and Development of Materiel: Reliability Program for Materiel and Equipment," is described as the first Army Regulation of its kind ever published. Actually, it is a substantially amplified and fortified version of Army R&D Directive 705-1, published in March 1962.

Department of Defense Instruction 3200.6, Reporting of Research, Development and Engineering Program Information, is the basis of the Army Regulation. The DoD policy statement specifies the type of reliability information to be included in basic program documents.

AR 705-25 incorporates policies and procedures set forth in a number of existing Army directives, memoranda and letters concerning reliability requirements and specifications. An official in the Office of the Chief of Research and Development, stated:

"It is expected that this consolidation will be of distinct value in revitalizing the Army's materiel reliability program."

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Walter M. Carlson

As the newly appointed Defense Director of Technical Information, Office of the Director of Defense Research and Engineering, Mr. Carlson leaves private industry to accept the challenge of establishing a DoD program aimed at better utilization of RDT&E information. (See story page 2.)

### Expanded Effort Prescribed To Improve Utilization of Available R&D Knowledge

Basic policy and a far-ranging concept for the handling of technical information within the Department of Defense are stated in DoD Directive No. 5100.36, dated to take effect with the advent of the New Year.

The Directive carries the signature of Deputy Secretary of Defense Roswell Gilpatric, who recently addressed a memorandum to all Defense agencies concerned with the problem of disseminating scientific information.

Instructions in the Oct. 3 memorandum required all DoD agencies to complete, as a matter of priority, the inventory and analysis of their scientific and technical information activities requested in a memorandum dated 14 June from the Office of the Director of Defense Research and Engineering.

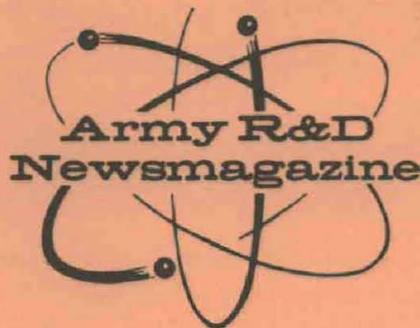
The Department of the Army Scientific and Technical Information Program, based on recommendations by an Ad Hoc Group established by direction of the Chief of Research and Development, was in the final phase of coordination with other Army agencies as this publication went to press. It was expected to be submitted to the Secretary of the Army for decision early in 1963.

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## DoD Leaders Review Army Limited War Lab Progress



Dr. John McLucas, Deputy Director of Defense Research and Engineering (Tactical Warfare Programs), center, and Maj Gen George W. Power, Army Deputy Chief of Research and Development, left, discuss U.S. Army Limited War Laboratory with Col Sterling Holmes, LWL Commander. (Story page 2.)



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

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## DoD Appoints Carlson to Direct Information

Walter M. Carlson assumed duties Jan. 1 as Defense Director of Technical Information in the office of the Director of Defense Research and Engineering.

His office will serve as the focal point in developing and recommending policy for the review and coordination of DoD scientific and technical information activities. Objective: To achieve more effective collection, storage, dissemination and use of information to minimize overlapping and duplication of research and development activities financed by the Government.

Born in Denver, Colo., Sept. 18, 1916, Mr. Carlson was graduated from the University of Colorado, receiving a B.S. degree in chemical engineering in 1938 and an M.S. degree in 1939.

Since 1939 he has worked for the DuPont Co., Wilmington, Del., on assignments involving process improvement, development engineering and

planning studies. In 1954 he pioneered installation and use of large computers at DuPont and set up the first operations analysis group in the Engineering Department of that firm.

Recently he has been serving as Laboratory Technical Coordinator in the Engineering Department working on information storage and retrieval systems and on new storage concepts.

A member of the Board of Governors of the American Federation of Information Processing Societies, representing the Association for Computing Machinery, he was recently elected National Director of the American Institute of Chemical Engineers. He organized the Machine Computation Committee of the American Institute of Chemical Engineers in 1958, and is currently serving as Chairman of the Information Systems Committee of the Engineers Joint Council.

Married and the father of six children, he now resides with his family in Delaware County, Pa.

## Defense Officials Inspect New Weapons Systems

Field inspection of advances in atomic munitions and other high priority weapons systems recently took Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen to West Coast installations.

Dr. Larsen was briefed at the Lawrence Radiation Laboratories, Livermore, Calif., and observed the progress made on the MAULER and REDEYE missile systems at General Dynamics in Pomona. A presentation on the development of a new light observation helicopter was given at the Hughes Tool Co., Culver City.

At the U.S. Army Combat Developments Experimentation Center (CDEC), Hunter Liggett Military Reservation, he observed CDEC's current experiment, designated to determine by field experimentation the type and number of antitank weapons necessary for protection of an infantry ROAD battalion.

As a demonstration of the Army's mobility, the inspecting party was flown to different battle areas on the 250,000-acre field laboratory in the UH-1B Iroquois helicopter.

The party included Dr. John L. McCucas, Deputy Director of Defense Research and Engineering, Samuel Perry of the same office and Lt Col William Perry, of Dr. Larsen's staff.

Army representatives were Col E. H. Almquist, Deputy Director of

Combat Developments, Department of Army Operations; Col B. O. Baker, Office, Chief of Research and Development; and Lt Col Raymond Miller, Office of the Deputy Chief of Staff for Operations.



**ON FIELD INSPECTION TOUR,** Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen stops to thank Sgt Luther B. Dewalt of Company A, 3rd Armored Rifle Battalion, 41st Infantry, for his part in demonstration of the 106 mm. recoilless rifle in CDEC's "Battalion Tank Operations" at Fort Ord, Calif.

## Expanded Effort Directed to Improve Use of Available R&D Knowledge

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The new DoD Directive actually regulates two separate information programs, one dealing with scientific and technical information, the other with production engineering and logistics.

The Scientific and Technical Information Program, as set forth by the Directive, provides, within DoD, for the handling and dissemination of technical data and documents or their abstracts. Included are:

“... The publishing of technical journals, the preparation and conduct of technical meetings and symposia, and the dissemination of information acquired by all other means, that are products of or are in direct support of DoD research, development, test and evaluation processes, and the management thereof, through the phase of design release to production.”

Similarly, the DoD Production Engineering and Logistics Information Program provides, within DoD, for:

“The handling and dissemination of engineering data, blueprints, standards, specifications, technical manuals, logistics data, management information, and other documentary information, that are products of or in direct support of acquisition, inventory management, storage, maintenance, distribution, movement, and disposal of materiel, supplies, tools, and equipment.”

Assignment of responsibilities for technical intelligence is contained in DoD Directive 5105.28, and is excluded from the scope of the new technical information Directive. Technical intelligence is defined as:

- Foreign developments in basic and applied research in natural and applied sciences and in applied engineering techniques.

- Scientific and technical characteristics, capabilities, and limitations of specific foreign weapons, weapons systems and materiel, and the production methods employed for their manufacture.

The Director of the Defense Intelligence Agency is required to “provide to the maximum extent possible information derived from technical intelligence activities for use in the DoD Scientific and Technical Information Program and the DoD Production Engineering and Logistics Information Program.”

The DoD information programs are to function as coordinated, decentralized information activities operated and administered by the Military Departments and other DoD components. Maximum use will be made of the

most modern techniques for information processing and exchange, including computer-type equipment when necessary for efficiency.

Although separate management of the respective information programs is provided by the new Directive, it specifies:

“Weapon system acquisition represents a continuous effort from basic research to production with information requirements at any point reaching into both information programs. Accordingly, the DoD Scientific and Technical Information Program and the DoD Production Engineering and Logistics Information Program will be designed to ensure maximum compatibility and interchange of information with each other.”

The Director of Defense Research and Engineering, Dr. Harold Brown, is assigned overall management con-

trol of the DoD Scientific and Technical Information Program, including supervision, coordination and review. Likewise, the Assistant Secretary of Defense (Installations and Logistics), Paul R. Ignatius, is charged with responsibility for the Production Engineering and Logistics Information Program.

“To ensure timely, effective and efficient conduct of its missions,” the Directive states, “DoD will pursue vigorous, well-organized, thoroughly coordinated, comprehensive technical information programs.”

“These programs will provide for the interchange of technical information within DoD, between DoD and its contractors, between DoD and other Federal agencies and their contractors, and between DoD and the scientific and technical community to the extent permitted by security.”

## Army Regulation Stresses Materiel Reliability

(Continued from page 1)

In stressing the importance of the program governed by AR 705-25, the official said reliability studies indicate that the cost of maintaining an average item of military electronic equipment, for example, is “eight to ten times the original cost of the item.”

Further, it was explained, in the case of a guided missile consisting of 100 components, each having an apparently high 99 percent reliability, the overall reliability would be only 36.5 percent—that is, two out of three of the missiles would fail.

The degree of reliability essential to success is accentuated additionally by the fact that the missile system actually may have many thousands of components.

Considered in relation to requirements for thousands of items of Army materiel, reliability thus becomes one of the most meaningful words in military usage—as one leader put it, “a multimillion dollar word where a component costing perhaps a few cents may decide success or failure.”

The new Regulation specifies policies and responsibilities concerning reliability and details the type of information to be included in such research and development documents as Qualitative Materiel Requirements, and Technical Development Plans.

The Army reliability program cornerstone is the concept that adequate design parameters must be established in the earliest phases of the research, development, test and evaluation cycle.

Major commands and agencies representing the users of Army materiel and equipment are advised by AR 705-25 that factors critical to reliability design must be explicitly established and prescribed. Precise design parameters will serve also as the bases for incentive contracts to encourage extended efforts on the part of the contractor.

To provide experience data on which to base operational and design requirements for materiel and equipment reliability, AR 705-25 stipulates that Army commands and agencies having research and development functions establish reliability data files.

While the data file concept is not new, use on a rather limited basis has demonstrated it may prove invaluable as an aid to improved design of materiel items, or in influencing design of new weapons systems, one of the program planners said.

Designated major Army commands are charged by AR 705-25 with responsibility to establish data files responsive to their own missions. Information will be of two basic types:

- Technical information of interest primarily to engineering personnel.

- Operational information of special value to commands or agencies representing the ultimate user.

Establishment of a maintenance data file in the Supply and Maintenance Command, U.S. Army Materiel Command, is underway. It is contemplated that much of the data col-

(Continued on page 4)

## Department of Defense Leaders Review Army Limited War Lab Progress

Capability of the U.S. Army Limited War Laboratory (LWL) at Aberdeen Proving Ground, Md., to perform the urgent mission it assumed when activated in June 1962 is advancing at a rate agreeable to DoD leaders.

Progress toward priority objectives was reviewed recently when six Department of Defense and Army leaders were briefed at the Laboratory.

Heading the group were Dr. John L. McClucas, Deputy Director, Tactical Warfare Programs, Office of the Director of Defense Research and Engineering, Office of the Secretary of Defense, and Maj Gen George W.

Power, Army Deputy Chief of Research and Development.

Brig Gen William W. Beverley, formerly Assistant Director of Army Research, and now assigned to the Office of the Deputy Director, Tactical Warfare Programs, OSD, and Melvin Bell, Director of Ordnance in the same office, were among ranking members of the group.

Others in the party were Col Edwin L. Powell, Office of the Deputy Director, Tactical Warfare Programs, OSD, and Col Donald D. Blackburn, Chief, Special Warfare Office, Office of the Chief of Research and Development,

Department of the Army.

Col Sterling C. Holmes, LWL Commanding Officer, reviewed its activities, discussed problems of recruiting a highly selective group of scientists and engineers, and explained projects being undertaken with respect to goals. He reported also on a recent 3-week trip to Thailand and Viet Nam to observe specific operations and discuss requirements the LWL may help to meet.

Dr. McClucas indicated he was particularly interested in methods being developed to achieve quick response to operational requirements for counterinsurgency and guerrilla operations in remote areas of the world.

Discussed at the meeting were the delegation of authority to the LWL for expeditious coordination with the Combat Developments Command, the Test and Evaluation Command, and Special Forces at Fort Bragg, N.C. Utilization of resources and talents in other Army laboratories and industry was considered, along with avoiding duplication of development efforts of Government agencies.

## RDT&E Generals View Work at West Coast Labs

Five Army generals responsible for research, development, testing, evaluation and manufacturing activities visited key West Coast installations Dec. 18-21. The group included:

Lt Gen John P. Daley, Commanding General, U.S. Army Combat Developments Command; Lt Gen Frank S. Besson, Jr., Commanding General, U.S. Army Materiel Command; Lt Gen Dwight E. Beach, Chief of Research and Development; Brig Gen Walter B. Richardson, Director, Combat Developments, Deputy Chief of Staff for Military Operations; and Brig Gen William T. Ryder, Director, Special Weapons, Office, Chief of Research and Development.

The group toured the Los Alamos Scientific Laboratories, Los Alamos, N. Mex.; the Sandia Corp.; Sandia Base, N. Mex.; and Lawrence Radiation Laboratories, Livermore, Calif.

Maj Gen Harold C. Donnelly (USAF), Commander, Field Command, Defense Atomic Support Agency, and his staff briefed the visitors on the latest progress in atomic research and testing. The general expressed satisfaction at this opportunity to enhance the posture of the Army in resolving key problems by teamwork through the highest levels of command.

Emphasis was laid on the value of top policy-making officials gaining a comprehensive insight into problems by personal observation and discussion with scientists, engineers and administrators in the laboratories and in the field.

While at the Lawrence Radiation Laboratories, General Beach met with 11 R&D officers assigned there as research scientists and engineers. Each of the men has a graduate degree in a field of science or engineering. Three of them, Maj G. C. Reinhardt,

Capt C. E. Williams and Capt J. P. Wade, Jr., hold Ph. D. degrees in physics from University of Virginia.

In speaking to the group, General Beach emphasized the importance of the work each is doing at the laboratories, and noted the value such experience had both for the men and the Army when they move on to later R&D assignments.

## Army Regulation Stresses Materiel Reliability

(Continued from page 3)  
lected and stored at the Army Maintenance Data Processing Center will be used Army-wide in setting reliability design criteria. The Center will use existing facilities and reports to the maximum extent to gather reliability information.

Chief among the major commands which have the responsibility for expressing the needs of the soldier with respect to materiel is the Combat Developments Command. The CDC has responsibility for initiating Qualitative Materiel Requirements, known as QMRs, which serve as guidelines in the RDT&E cycle.

Similarly, the Chief of Research and Development has Army General Staff responsibilities for the overall reliability function pertaining to materiel and equipment. AR 705-25 provides that the CRD will continue to formulate, issue, and maintain current Army policies regarding materiel reliability.

The Deputy Chief of Staff for Logistics and the Deputy Chief of Staff for Military Operations in their respective areas of interest, as set forth in AR 10-5, are charged with implementation of reliability policies.

Commanding Generals of the U.S. Army Materiel Command, the U.S. Army Combat Developments Command, the U.S. Army Air Defense

Command, the Chief of Engineers, the Chief of the U.S. Army Security Agency and The Surgeon General, within assigned responsibilities, "will assure effective coordination of reliability functions. . . ."

Reliability of Army materiel and equipment is to be achieved by:

- Effective planning, programing, and managerial direction.
- Adequate research, engineering design, development, test and evaluation.
- Efficient administration of logistical and operational procedures designated to preserve inherent reliability.
- Establishing data files of critical information on reliability for design and planning activities.

Regarding the magnitude of the problems attendant to the achievement Army-wide of the highest possible standards of reliability, an executive in the Office of the Chief of Research and Development was optimistic.

"There can be no question," he said, "but that the Army is moving forward in its search for reliability. The rewards are enormous, in money saved, but even more significant in the increased capabilities of the combat soldier provided with the most dependable materiel."

# NSF Survey Shows R&D 1963 Funding May Hit \$14.7 Billion

Research and development fund obligations are expected to total about \$14.7 billion during fiscal year 1963—an increase of \$3.5 billion (31 percent) over the \$11.2 billion R&D expenditure in FY 1962.

Data obtained in the 11th annual survey conducted by the National Science Foundation in cooperation with other Federal agencies show that \$8.5 billion in FY 1963 will be obligated for development and \$4.5 billion for research. An estimated \$1.6 billion will go into R&D plants or facilities and \$100 million for scientific and technical information.

Survey findings point to a continuous rise of the national investment in military, space and atomic energy programs, as well as to greater national support of programs concerned with health, welfare and national resources.

Four of the 27 reporting agencies in the survey account for 95 percent of the total estimate of R&D fund obligations in FY 1963. The Department of Defense reported \$7.4 billion, up from \$6.7 billion in 1962.

The National Aeronautics and Space Administration expects to double its R&D funds from \$1.4 billion in 1962 to \$2.8 billion in 1963. In large part the NASA increase reflects the national decision to undertake the complex manned lunar landing and return program.

The Atomic Energy Commission and the Department of Health, Education and Welfare also expect large gains in R&D spending.

About four-fifths of Federal funds for research and development are for support of work outside the Government; 65 percent is expected to go to industry, 12 percent to educational institutions, and 4 percent to other nonprofit and foreign organizations.

About 12 percent of these extramural obligations is expected to go to Federal contract research centers, administered by industry, universities, or other nonprofit organizations.

Basic research obligations are expected to increase about 32 percent, from \$1.1 billion in 1962 to \$1.5 billion in 1963. This continuation of increase in basic research is due in large measure to the expanding space program and the tools and equipment required for its support.

According to the latest estimate based on Congressional action, obligations for R&D plant are expected to increase by 60 percent from \$1.0 billion in 1962 to \$1.6 billion in 1963.

This increase is predominantly attributable to construction and acquisition activities of the National Aeronautics and Space Administration.

Federal funds for research and development, including facilities, in 1963 are estimated as 16 times the corresponding funds in 1948. During this 15-year period, Federal expendi-

tures for research and development as a percentage of total Federal expenditures have increased from 2.5 percent to approximately 13 percent.

Complete results of the survey are to be published in *Federal Funds for Science XI* by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

## DoD Authorizes New Mapping Office Within DIA

Secretary of Defense Robert S. McNamara has authorized the establishment of an Office of Assistant Director for Mapping, Charting and Geodesy within the Defense Intelligence Agency (DIA).

The new office will develop standard DOD policies and programs and assist the DIA Director in discharging his responsibility for assembling, validating, integrating and ranking in priority all DOD requirements.

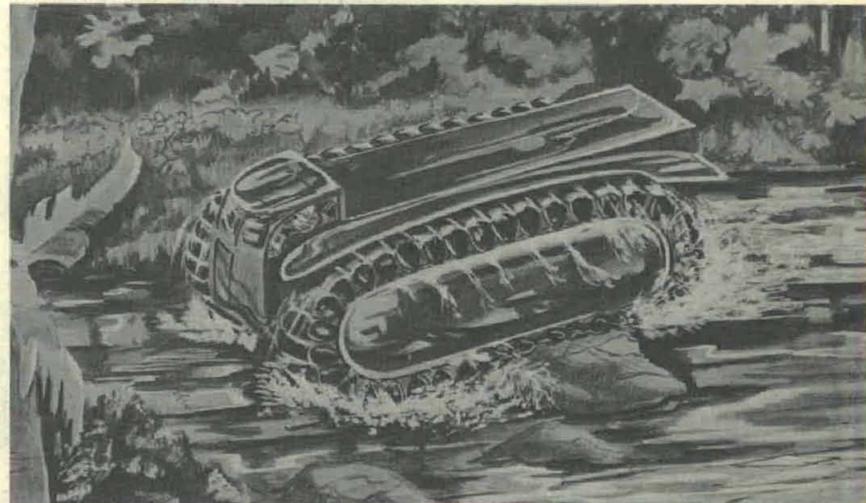
Production of maps, charts or geodetic materials will continue to be the responsibility of the Army Map Service, the Navy Oceanographic Office and the Air Force Aeronautical Chart and Information Center.

The new unit will have a civilian-military group of about 75 persons representing all military departments.

In the field, unified and specified combat commanders will be assigned new mapping, charting and geodetic responsibilities.

Secretary McNamara's Directive (5105.27) specifically excludes from the jurisdiction of the new office the intelligence aspects of area analysis (such as geographic and terrain studies), mapping activities in connection with military construction or civil works, and those aspects of photo interpretation and oceanography not directly related to mapping, charting and geodetic activities.

Recommendations made by the Director of the DIA pertaining to mapping, charting and geodetic policies or programs will go to the Joint Chiefs of Staff for the establishment of requirements and guidance.



Plenum Air Tread Amphibian (artist's concept) is under development for the Army Transportation Research Command by Chance Vought Corp. The vehicle is designed to operate on a continuous track of air-filled rubber cells, giving it high flotation capabilities and permitting it to ride on hard surfaces, snow, and in water. The vehicle design combines the advantages of the Ground Effects phenomena with the positive control of wheeled and tracked vehicles. It is expected to hit 50 m.p.h. on smooth surfaces, and 30 m.p.h. in water.

## Army Mathematics Center Slates 1963 Program

Orientation lectures, advanced seminars, a symposium and extended residencies will be offered to Army mathematicians during 1963 at the U.S. Army Mathematics Research Center (MRC), Madison, Wis.

The aim of the orientation series is the exposition of ideas rather than the development of techniques. Lectures will be no more technical than necessary and are directed at users of mathematics as well as mathematicians.

The series will include: "The Planning and Analysis of Scientific Experiments," Dr. Marvin Zelen, Feb. 19-21; "The Numerical Solution of Partial Differential Equations," Dr. Donald Greenspan, Mar 5-7; "Eigenvalue Problems and their Applications," Dr. Calvin Wilcox, July 9-11.

Advanced seminars will be conducted to permit "give and take" between men devoted to the study of a segment of mathematical or statistical theory in which there have been important modern developments of possible relevancy to Army interests.

Seminars scheduled are "Non-linear Integral Equations, and Applications," Dr. Philip Anselone, Apr. 29-May 1, and "Recent Advances in Matrix Theory," Dr. Hans Schneider, Oct. 14-16.

A symposium on "Stochastic Models in Biology and Medicine," June 12-14, will feature prominent speakers from the U.S. and Europe.

To offer an opportunity for extending competency in an applied mathematics field, the MRC has established

### Picatinny Arsenal Given 700-Page Adhesives Book

*Handbook of Adhesives*, a new 700-page volume described as the only one of its kind on adhesives for military applications, was presented recently to the Picatinny Arsenal library by editor Michael J. Bodnar.

The book contains 17 scientific papers presented a year ago during the Symposium on Adhesives for Structural Applications, held at Picatinny Arsenal, Dover, N.J.

Prepared by top-ranking authorities in their fields, the technical papers in the book provide information on the most advanced adhesives technology, primarily for use by design engineers and military contractors.

Bodnar is Chief of the Materials Research Section at the Arsenal. In addition to organizing the Symposium and editing the book, he has written the chapter on "Bonding Plastics."

research residences available to civilian and military personnel of the Army. The residency periods vary, but should last at least three months.

The MRC was established in 1956 in recognition of the critical essentiality of advanced mathematical techniques to a modern army. To fulfill its mission of advising the Army on specific problems beyond the

## Army Plans Field Test of 57-Pound Portable X-Ray

Diagnosis of battlefield injuries minutes after they occur may be speeded through a new 57-pound field X-ray unit developed by the U.S. Army Medical Equipment Research and Development Laboratory, Fort Totten, N.Y.

The unit can be carried by one man, quickly set up, put in operation, and disassembled for transportation to another location if necessary.

Based on a design conceived by Benjamin D. Pile, Technical Director of the Laboratory, the unit features simplicity, mobility and reliability in a compact package that will take diagnostic radiographs of any part of the body.

Scheduled for field testing in early 1963, the unit was demonstrated last month at Walter Reed General Hospital, Washington, D.C. It uses either a conventional power source or its own power pack in situations, such as a combat zone, where conventional electric power is not available.

The power pack operates on either 110 or 220 volts alternating current and incorporates a silver cadmium battery as the prime power source.

scope of other facilities, the MRC is staffed with approximately 50 distinguished mathematicians from many parts of the world. Their range of specialties covers more than 20 areas of mathematics.

Persons interested in full details and requirements for any of the above MRC programs should address correspondence to Dr. R. E. Langer, Director, Mathematics Research Center, U.S. Army, University of Wisconsin, Madison 6, Wis.

When battery operated, the unit has the capacity to take at least 165 radiographs without recharging.

The X-ray tube operates at 120 kilovolts and a current of 1.5 milliamperes, furnished by a 400-cycle transformer, which adds to the machine's high utility and lower power requirements. Both tube and transformer are housed in a small gas-insulated cylindrical container.

The electrical factors of high voltage and low current reduce the amount of radiation to which the patient is exposed in addition to reducing the power requirements and weight of the unit.

Earlier developmental efforts to produce portable, battlefield X-ray equipment have not been fully successful because in application the apparatus did not withstand field conditions.

The new machine was developed at the Fort Totten Laboratory under contract with Bracke-Seib X-Ray Co., Inc., Pelham Manor, N.Y., with subcontracting for electrical design and fabrication by Sperry Products, Inc., Danbury, Conn.



New portable 57-pound X-ray developed for battle field use by the Army is demonstrated under simulated combat conditions at Fort Totten, N.Y.

# AEC, DoD, NASA Agree on Space Reactor Development

Establishment of a program office for the development of a space reactor was announced Dec. 27 by the Atomic Energy Commission, the Department of Defense and the National Aeronautics and Space Administration.

The Program Manager is Col Elwood M. Douthett, USAF, with offices at AEC Headquarters, Germantown, Md.

The office will be responsible for research, technology and component development phases of the advanced nuclear electric space power unit, designated SNAP-50/SPUR.

The assignment of responsibility is in accordance with a memorandum of understanding between the AEC, DoD and NASA.

The AEC will have complete responsibility and authority for research and development of all nuclear and nonnuclear components and their integration into an experimental system. Responsibility includes nuclear safety through all phases of development and flight tests.

The DoD will establish military requirements for the power unit and provide direct project support on those phases assigned to the DoD by the SNAP-50/SPUR office, and supporting data from its own programs as appropriate.

Integration of the nuclear-electric power system with other DoD mission system components, including the space vehicle and the launch complex, and for the flight test of the complete nuclear electric power, are assigned to the DoD.

NASA will be responsible for supplying supporting data as appropriate from its own programs of nonnuclear component and system research and technology development for multi-megawatt electric generating systems.

The SNAP-50/SPUR power unit will be in the 300-1000 electrical kilowatt range. It will be capable of operating unattended for at least 10,000 hours with a weight of 10-20 pounds per kilowatt unshielded. The reactor will be lithium cooled. The

unit could be used as a power source for space missions, communications satellites and other space applications requiring large amounts of power.

Before the memorandum of understanding, both the AEC and the Air Force were engaged in the development of space power units of the type described above. The AEC program was designated SNAP-50. The letters SNAP stand for "Systems for Nuclear Auxiliary Power." The Air Force program was designated SPUR (Space Power Unit Reactor).

Col Douthett has a broad scientific background, having studied at Penn State College, Ohio State University and the University of California where he received a Ph.D. degree in nuclear chemistry.

## SATCOM Agency Prepares For Testing of SYNCOM

The Army Satellite Communications Agency (SATCOM) will send signals through 22,300 miles of space to activate and test the National Aeronautics and Space Administration's SYNCOM satellite.

Scheduled for launching early in 1963, SYNCOM, under overall NASA management, is being supported by the Department of Defense. It is the first U.S. synchronous orbital communications satellite, and is being developed by Goddard Space Flight Center of NASA through a contract with Hughes Aircraft Co.

SATCOM will test SYNCOM's capabilities as an active spatial communications relay point by sending signals from surface terminals. Located at Fort Monmouth, N.J., SATCOM is responsible for Army research development, engineering, procurement, and installation of the surface communications facilities for the Defense Communications Satellite System.

The global surface system for military satellite communications research and development will include test stations already existing at Fort Dix, N.J. and Camp Roberts, Calif. The USNS Kingsport has been equipped by the U.S. Navy Bureau of Ships at the Philadelphia Naval Shipyard as a seagoing satellite communications terminal for SATCOM. An air transportable terminal has been installed by the Army at the Lakehurst, N.J., Naval Air Station.

## USAR R&D Unit Leader Wins Achievement Award

The Department of the Army Certificate of Achievement, awarded for outstanding performance of duty and contributions to Army research and development from February 1949 to January 1963, highlights the retirement of Col Herman M. Roth after 30 years service.

In conferring the Certificate, Chief of Research and Development Lt Gen Dwight E. Beach commended the colonel's many contributions to the Armed Forces.

As the first commander of the 3252nd USAR R&D Unit in 1949 (then the 3161st), Col Roth guided the unit through the lean years for R&D units and through the numerous changes in the Reserve structure.

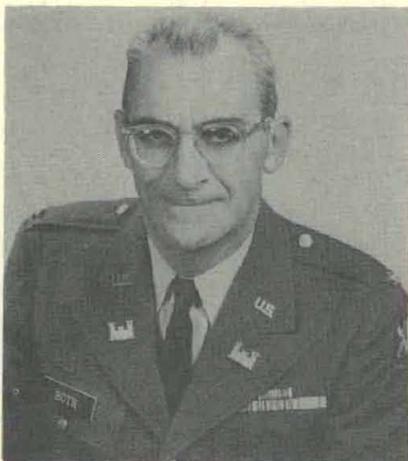
In his present civilian position as Director, Research and Development Division, U.S. Atomic Energy Commission, Oak Ridge, Tenn., he was lauded for fostering Army relations with industry, leaders of foreign countries, outstanding scientists, and community officials.

Col Roth was cited for organizing and conducting Atomic Energy Conferences for Reservists of the 3d Army area at Oak Ridge, Tenn., in 1953 and 1954.

Under his directorship, the 3252nd USAR R&D Unit planned and con-

ducted two Nuclear Science Seminars in 1960 and 1962. These seminars were attended by approximately 80 officers, representing all U.S. Army Corps in the United States.

Col Roth received B.S. and M.S. degrees at the University of Virginia and a Ph. D. degree in physics at Ohio State University. During his career, he has held responsible research and development civilian positions in universities as well as with the Atomic Energy Commission.



Col Herman M. Roth



Col Robert B. Burlin, Director of the Army Nuclear Power Program, presents model of Army's first nuclear power plant, the SM-1, to the Smithsonian Institution. Accepting is Dr. P. W. Bishop, center, of the Smithsonian's Division of Manufacturers and Heavy Industries and Dr. Clyde L. Cowan, professor of physics at Catholic University and Adviser to the Museum.

## SM-1 Joins Smithsonian Nuclear Energy Exhibits

The Army's first nuclear power plant, put into operation at Fort Belvoir, Va., in 1957 by joint effort of the Atomic Energy Commission and the Army Corps of Engineers, is being commemorated by the Smithsonian Institution.

A model of the SM-1, the original land-based military nuclear power plant, was transferred recently to the Division of Manufacturers and Heavy Industries of the U.S. National Museum. It will be displayed in the hall of nuclear energy being prepared for the Smithsonian's new Museum of History and Technology.

Described by the Nuclear Power Division of the Office of the Chief of Engineers as the world's first nuclear power plant to supply power to an electrical system, the SM-1 was designed to produce a net electrical output of 1,855 kw. per hour—the normal requirement of a city of 4,000.

The SM-1 design was later expanded for application at Fort Greely, Alaska, where the SM-1A field plant is furnishing heat and electricity in support of the installation.

Used primarily as a training facility for military nuclear power plant operators, the SM-1 still serves for important research and development. Based on the SM-1 technological advances, plants in Greenland, Wyoming and Antarctica were pre-packaged by their manufacturers in

air-transportable modules for rapid installation at remote sites.

Army Nuclear Power Program research and development of reactor core designs have been implemented by studies using the SM-1. Its successors now obtain as much heat from 37 nuclear fuel elements as the parent SM-1 achieved with 45.

Crews trained by the Army Nuclear Power Program, presented the SM-1 model to Dr. P. W. Bishop, Acting Curator of the Smithsonian's Division of Manufacturers and Heavy Industries. The model is to be accompanied in the Smithsonian display by demonstration of the method of making reactor core fuel elements.

## Dr. Wadley Retires After 41 Years of Service

Forty-one years of Federal Government service ended recently for Dr. Francis M. Wadley when he was honored at a retirement luncheon by his colleagues at the U.S. Army Biological Laboratories, Fort Detrick, Md.

Col Carl S. Casto, Commanding Officer, presented Dr. Wadley with a Certificate of Achievement and a Letter of Appreciation, and commented:

"Your retirement marks the end of a long and eventful career during which your services to the Government have been of inestimable value. . . . Your 40-year service pin award

## Fort Detrick Labs Offer Resident Associateships

Postdoctoral resident research associateships, sponsored by the National Academy of Sciences-National Research Council, are offered during 1963-64 at the U.S. Army Biological Laboratories, Fort Detrick, Md.

The program, which includes an annual gross stipend of \$9,475 to successful applicants, was announced by John E. Thompson, Fort Detrick Personnel Officer.

Purpose of the research associateships is to provide young investigators of unusual ability and promise an opportunity for advanced training in basic research in the various branches of the biophysical and biological sciences.

Fort Detrick will provide the necessary supervision, facilities, and equipment for the program and will administer the associateships.

Providing unusual research opportunities, the program is open to U.S. citizens who have completed requirements for a doctoral degree and who can produce evidence of superior ability for creative research in any of the following biophysical or biological sciences:

Aerobiology, Bacteriology, Biochemistry, Biomathematics, Biophysics, Immunology, Medical Entomology, Plant Sciences, and Virology.

Available to the successful selectees will be what Army leaders consider one of the world's best equipped laboratories, including the services of outstanding consultants in their respective fields of interest.

Applications will be accepted and processed by the Fellowship Office, National Academy of Sciences-National Research Council, 2101 Constitution Avenue, Washington 25, D.C.

last year was a Detrick record."

Employed at Fort Detrick since 1956 as an analytical statistician, Dr. Wadley began his Federal career in 1914 on a part-time basis with the Department of Agriculture and was added to the permanent staff as an entomologist until 1936, when he became a statistician.

After receiving a B.S. degree from Kansas State University, Manhattan, Kans. (1916) and an M.S. degree (1922), he earned a Ph. D. degree at the University of Minnesota in 1928, majoring in biology, entomology, biochemistry and statistics.

## Maj McWhorter Receives Gen G. C. Marshall Award

Maj John C. McWhorter was the recipient of the General George C. Marshall award for outstanding scholarship at the graduation exercises of the U.S. Army Command and General Staff College held Dec. 20 at Fort Leavenworth, Kans.

Under Secretary of the Army Stephen Ailes, guest speaker at the ceremony, presented the award. Maj McWhorter graduated at the head of his class of 444 officers attending the fall 1962 associate course.

Completing the 18-week course were 411 U.S. Army officers and 33 officers from 15 allied nations.

Assigned to temporary duty while attending the course, he is a research and development coordinator in the Medical and Biological Sciences Branch, Life Sciences Division, U.S. Army Research Office, Arlington, Va. Shortly before leaving for the Command and General Staff College, he was lauded for outstanding performance of his duties and recommended for promotion in advance of normal eligibility.

A native of Edinburg, Tex., he graduated from the U.S. Military Academy in 1946 and holds an M.S. degree from Lowell Technological Institute, Lowell, Mass.

## USARO Scientists Accepts

Dr. Herbert L. Ley, Jr., U.S. Army Research Office (USARO), Arlington, Va., has been named Associate Professor of Epidemiology and Applied Microbiology at the Harvard School of Public Health, Department of Microbiology, Boston, Mass.

As Chief, Medical and Biological Sciences Branch and Acting Chief, Scientific Analysis Branch, Life Sciences Division, he has been with USARO since mid-1961 when he was appointed to his PL-313 position.

Previously, for three years, he was Professor of Microbiology and Community Health and Executive Officer (Chairman) of the George Washington University Medical School, Washington, D.C.

A native of Columbus, Ohio, Dr. Ley earned an honors certificate in physics at Harvard College before going on to win his M.D. degree (1946) at Harvard Medical School. Following a year of internship, he entered on military duty at the Walter Reed Army Institute of Research.

After earning an M.P.H. degree at the Harvard University School of Public Health, he served as an epi-



OUTSTANDING GRADUATE Maj John C. McWhorter receives Gen George C. Marshall Award from Under Secretary of the Army Stephen Ailes. Looking on are Maj Gen Harold K. Johnson, left, Commandant, Army Command and General Staff College, and Brig Gen J. Lemley, Assistant Commandant.

## Book Lists Dr. Siple Among Leaders in Science

A newly published book titled *Modern Americans in Science and Technology*, authored by Edna Yost in the "Makers of Our Modern World Series," lists Dr. Paul A. Siple, U.S. Army Research Office Scientific Adviser, among 13 leaders.

Internationally acclaimed as a polar explorer, geographer and scientist, Dr. Siple is presented in the company of such distinguished scien-

tists as Elmer A. Sperry, Enrico Fermi, John P. Hagen and Robert Hutchings Goddard.

Sperry, of course, is renowned as the inventor of gyroscope and automatic pilot controls, Fermi as the nuclear physicist who was the first man to achieve a chain reaction in atomic fission, Hagen as a pioneer in radio astronomy and director of the first U.S. earth satellite project (Vanguard), and Goddard as the man whose rocketry experiments opened up the whole new scientific field of space exploration.

Others cited in *Modern Americans in Science and Technology* are:

- George Washington Carver, who rose from slavery to earn recognition as the scientific "wizard of Tuskegee Institute" and made peanuts a valuable crop in the south.
- Leo Hendrik Baekeland, inventor of the bakelite plastics.
- Willis H. Carrier, credited as the man "who learned to manufacture weather" and laid the cornerstone of the air-conditioning industry.
- Frederick G. Cottrell, inventor of the electrical precipitator to remove dust, smoke and fumes from manufacturing processes before discharge into the atmosphere, who thereby salvaged many industrial wastes for use.
- Charles F. Kettering, inventor of the electric starter for motors.
- Robert R. Williams, the scientist who has isolated and synthesized Vitamin B<sub>12</sub>.
- Robert Truog, pioneer in the study of soil chemistry.
- Vladimir K. Zworykin, world-famed in the field of electronics.

## Position at Harvard

demiologist in various posts including Japan and Korea, and was awarded the Bronze Star. His final military assignment was Chief, Preventive Medicine Research Branch, Research and Development Division, Office of the Surgeon General.

The author of numerous professional publications, Dr. Ley has been accorded many honors, including selection as Diplomate, American Board of Preventive Medicine (1953), and Fellow, American College of Preventive Medicine (1954).



Dr. Herbert L. Ley, Jr.

## Army's First Woman Surgeon Promoted to Lt Col

The only woman assigned as a U.S. Army surgeon, Janice A. Mendelson, was promoted recently to lieutenant colonel. Known also for her scientific research, her technical paper on treatment of experimental wounds earned a \$300 award at the 1962 biennial Army Science Conference.

A Regular Army Medical Services surgeon since 1955, she is currently assigned as Chief of Trauma Investigations, Biophysics Division, U.S. Army Chemical Corps Research and Development Laboratories, Edgewood Arsenal, Md.

A Fellow of the American College of Surgeons and certified by the American Board of Surgery, she has been engaged in research and teaching at the Arsenal for four years. Previous tours of duty were at Womack Army Hospital, Fort Bragg, N.C., and Valley Forge Army Hospital, Valley Forge, Pa.

Prior to entering the service, she practiced in Dayton, Ohio. She is an alumna of the University of Pittsburgh, Wilson Teachers College and Ohio State University.

The daughter of an Army doctor who served in many foreign posts, Lt Col Mendelson became used to travel at an early age. She grew up in China, where her father practiced in



Lt Col Janice A. Mendelson

the service and later as a civilian, and believes the military surgeon has a real opportunity to combine practical knowledge with research.

"There are many challenges in clinical surgery in seeking ways to treat casualties under conditions of modern warfare," she said. "These include varied situations where optimum surgical care cannot be given. For instance, in jungle or guerrilla warfare, in radioactive areas, or where mass casualties are overtaxing established medical centers.

## Col Bigelow Retires, Lauded for Reserve Deeds

Dedicated service to the Army has won Col Maurice H. Bigelow, Commander of the 1332nd U.S. Army Reserve Research and Development Unit (1957-62), the Department of the Army Certificate of Achievement and a letter of commendation.

Chief of Research and Development Lt Gen Dwight E. Beach, in conferring the Certificate, lauded Col Bigelow's accomplishments. Specifically noted was his recruiting program which established a sound base for continued growth of his unit.

In his commendation letter, Brig Gen W. F. Ryan, CG, U.S. Army Test and Evaluation Command, Aberdeen Proving Ground, Md., cited the colonel's special study and evaluation of a testing installation in July 1962. This study defined and remedied certain problem areas in a critical time of Army reorganization.

Retiring after many years in the Active Reserve, he has served three tours with OCRD. By way of research project work, he contributed information involving the study of plastic dielectrics for Signal Corps materiel.

Another of the colonel's projects was assisting the Medical Corps in the adaptation of fluorinated chloroplastic film for the packaging, shipping and preservation of dried but virally reconstitutable vaccines.



Col Maurice H. Bigelow

"I didn't expect to become an Army surgeon but, for an incurable wanderlust, the service guarantees new assignment and new areas in which to serve."

Frequently on loan to other posts as an expert in her field, she sees new places while on temporary duty as well as on military leave. One recent military trip took her to Africa, the farthest she has been from her home base at Edgewood Arsenal.

"If I had a civilian medical practice, I'd have to settle in one community," she said. "I wouldn't be free to travel without getting someone to watch my patients. In the service, when you are transferred, a well-trained replacement is arranged for before you leave for your new assignment."

Testimony to her devotion to duty is affirmed by the framed Certificate of Outstanding Achievement on her office wall. Presented at the 1962 Army Science Conference, it reads in part: "For a commendable contribution to science and to the furtherance of the U.S. Army Research and Development Program."

## DOD Assigns Shulman To Key Manpower Job

Stephen N. Shulman was installed recently as Deputy Assistant Secretary of Defense (Manpower) for Civilian Personnel and Industrial Relations.

Formerly executive assistant to Secretary of Labor W. Willard Wirtz and to former Secretary of Labor Arthur J. Goldberg, Mr. Shulman fills a new post combining the previously separate offices of Civilian Personnel and Industrial Relations Adviser.

In line with President Kennedy's Executive Order calling for employee-management cooperation in the Federal service, Mr. Shulman will be responsible for the development of civilian personnel policies and will provide guidance for relations with the Defense Department's more than 1,000,000 civilian employees.

On the industrial relations side he will be responsible for developing and coordinating policy in this area and also in maintaining liaison with both industry and labor organizations.

In the Department of Labor, Mr. Shulman served as acting executive vice chairman of the President's Committee on Equal Employment Opportunity. He is a graduate of Harvard College and Yale Law School, and has served in industrial relations with the Bendix Aviation Corp. in Towson, Md., and Utica, N.Y.

## Mapping Expert Ends 30-Year Federal Career

William C. Cude, known internationally for his work in photogrammetry, surveying and mapping, was honored Dec. 6 at a retirement dinner when he ended more than 30 years of Government career service.

Technical Adviser to the U.S. Army

## Materiel Leaders Discuss Standardization Program

U.S. Army materiel leaders discussed plans for conducting the standardization program within the new Army organization at a recent 2-day conference at Headquarters, Quartermaster Research and Engineering Command, Natick, Mass.

Richard White, Chief of the AMC Standardization and Value Analysis Branch, Procurement and Production Directorate, presided at the first standardization meeting since the AMC became operational in August.

Representatives from AMC Headquarters and eight subordinate commands considered methods of handling coordination of specifications and study projects. Means of improving the overall standardization program were explored.

AMC's Procurement and Production Directorate has been assigned standardization management for the Department of the Army. It brings together all the management functions previously assigned to the Army Standardization Office and the Army Technical Services.

The new organization, an AMC official stated, brings the field standardization elements closer to the top echelon group. Responsibilities previously assigned to chiefs of the Technical Services are now delegated to the field commands under AMC.

Represented at the conference were the Army Weapons Command, Army Electronics Command, Army Missile Command, Army Mobility Command, Army Munitions Command, Army Materials Research Center, Supply and Maintenance Command, and Quartermaster Research and Engineering Command.

Brig Gen Merrill L. Tribe, Commanding General of the QM R&E Center, welcomed the conferees. He stressed the importance of the standardization program in the Army, its contribution to improving logistical operations, and the emphasis which his headquarters attaches to the program. Herman B. Levitz, Chief, Technical Services Division, was conference chairman.

Engineer Geodesy, Intelligence and Mapping Research and Development Agency (GIMRADA), Fort Belvoir, Va., at the time of retirement, he has been a member of the American Society of Photogrammetry (ASP) since 1935. He was an ASP director (1945-47), first vice president in 1955 and president in 1956.

Mr. Cude was director and treasurer of the International Society of Photogrammetry (1947-52) and later was chairman of the International Liaison Committee of the ASP. He has served as chairman of the Committee on Photogrammetry, American Road Builders' Association, and as a member of the Board of Directors of the American Congress on Surveying and Mapping. He also is a member of the American Geophysical Union and the Society of American Military Engineers.

A Government career began in 1929 when he was employed by the Soil Conservation Service, U.S. Department of Agriculture, Washington, D.C. He transferred to Fort Belvoir in 1942. For a number of years, he served as Chief of the Topographic Department when it was part of the U.S. Army Engineer Research and Development Laboratories, and developed many items of equipment as well as improved techniques.

A veteran of World War II, with service in the South Pacific, Philippines and Japan, Cude continued his

## Aberdeen Dedicates Building Honoring Brig Gen Simpson

Building 3071, Headquarters, U.S. Army Test and Evaluation Command (TEC) Aberdeen Proving Ground, Md., was dedicated recently to the memory of Brig Gen Bethel Wood Simpson.

Brig Gen William F. Ryan, Commanding General of TEC, conducted the ceremony and gave the dedication speech. His tribute to General Simpson, former Assistant Commandant of the Ordnance School at Watertown Arsenal, Mass., cited his keen interest in development of artillery fuzes and his successful effort to broaden the curriculum to include scientific disciplines related to ordnance engineering. General Simpson was later Commander of the Ordnance Replacement Training Center at Aberdeen.

Mrs. Bethel Wood Simpson, General Wood's widow, and Col Charles L. Simpson, a son who presently is Executive Officer at the Proving Ground, were among honored guests.



William C. Cude, left, Technical Adviser to GIMRADA, receives agency plaque from Col W. H. Van Atta, at retirement ceremony at Fort Belvoir.

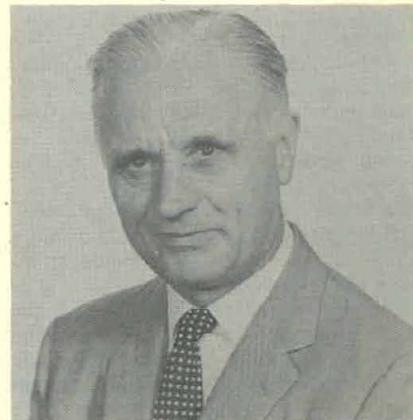
military career after the war as a Reserve officer, attaining the rank of lieutenant colonel.

## Dr. Krebs Joins WRAIR Staff In Biophysics Department

Dr. Adolph T. Krebs, internationally known biophysicist and radiobiologist, recently joined the staff of the Department of Biophysics, Division of Nuclear Medicine, Walter Reed Army Institute of Research (WRAIR), Washington, D.C.

Prior to coming to WRAIR, the German-born scientist was with the Army Medical Research Laboratory, Fort Knox, Ky., (1947-62). For the past several years he was concurrently a professor of biology at the University of Louisville.

Dr. Krebs earned a Ph. D. in physics and biophysics from the University of Frankfurt and was a member of the Kaiser Wilhelm Institute of Biophysics from 1937 to 1947. He is a member of the Physics, Radium, and Botany Societies; Aero Medical Association and N.Y. Academy of Radiobiology.



Dr. Adolph T. Krebs

## Gen Gibbs Becomes Deputy Chief Signal Officer

Maj Gen David Parker Gibbs took office Jan. 1 as Deputy Chief Signal Officer, U.S. Army, succeeding Maj Gen Herbert L. Scofield upon his retirement after more than 22 years of military service.

Assistant to the Chief Signal Officer since September 1962, General Gibbs is following in the footsteps of his father, Maj Gen George S. Gibbs, Chief Signal Officer from 1928-1931.

Graduated from the United States Military Academy in 1933, the new DCSigO served with Signal Corps units in the States and in Hawaii prior to World War II, in which he was assigned to Iceland and Europe from 1942 to 1945. His last nine months in Europe were spent as Signal Officer, XXII Corps.

Following assignments of progres-

### Education Leaders Confer On Military's Study Needs

"The Future Higher Educational Needs of Military Personnel" was the theme of the Fourth Armed Services Education Conference held Dec. 6-7 in Baltimore, Md.

More than 300 representatives of colleges and universities and the Armed Services heard University of Maryland president Wilson H. Elkins and the Honorable J. Millard Tawes, Governor of Maryland, extend a welcome to them to open the meeting.

Keynote speaker was Norman Paul, Assistant Secretary of Defense for Manpower, who spoke on the importance of education to men serving in the military services.

A panel discussion on "Educational Needs of the Armed Forces" was chaired by Brig Gen William O. Blandford, Military Executive for Education and Manpower, Office of Assistant Secretary of Defense (Manpower). Representatives of the Air Force, Army, Marines and Navy participated.

Other featured speakers included: Dr. Logan Wilson, president, American Council on Education; Dr. Gustave Arlt, president, Council of Graduate Schools in the U.S.; Lt Gen William S. Stone, Deputy Chief of Staff for Personnel, Headquarters, USAF; and Maj Gen Cecil E. Combs, Commandant of the Air Force Institute of Technology.

"Books and Bootstraps" was the title of the conference's summarizing address delivered by Dr. Edward L. Katzenbach, Jr., Deputy for Education and Manpower Resources, Office of the Assistant Secretary of Defense (Manpower).

sive responsibility in Memphis, Tenn., Camp Polk, La., and Fort Meade, Md., he attended the Air War College at Maxwell AFB, Ala., completing the course in June 1948. After two staff officer assignments in Washington, D.C., he became Assistant Secretary of the General Staff, Office of the Chief of Staff.

Graduated from the National War College in August 1953, he was assigned to the Far East as Signal Officer, Hq IX Corps in Korea. Later he was Chief of the Communications Branch, J-3 Division, Far East Command in Japan.

From September 1955 until August 1962 he was Chief Signal Officer, Hq U.S. Continental Army Command at Fort Monroe, Va., CO of the U.S. Army Training Center at Fort Gordon, Ga., and Deputy Chief of Staff, Communications and Electronics, Hq North American Defense Command,

### Basicpac Computer Satisfies Acceptance Tests

Proved satisfactory under all acceptance test conditions, Basicpac is the newest addition to the Army's Fieldata family of computers designed to provide combat commanders with speedy decision-making information.

Completion of the tests was announced by Col James M. Kimbrough, Jr., Commanding Officer of the U.S. Army Electronics Research and Development Laboratories, Fort Monmouth, N.J., who stated:

"Basicpac is playing an important role in the Army's program to utilize a family of militarized computers in a tactical field environment under ever-changing modes of battle technology."

Five Basicpacs have demonstrated their reliability over sustained periods of operations, controlling the flight of drone aircraft, directing fire-support systems, and in training Army computer operators.

Designed for use at combat division level, Basicpac is a medium-size data processor that can handle in minutes paperwork details that otherwise might require hours with respect to fire control, personnel and administration, logistics, intelligence and nuclear fallout prediction.

Solid-state circuitry designed for the worst conditions gives Basicpac an exceptionally high standard of reliability far exceeding rigid requirements specified by the Electronics R&D Laboratories. It operated at 125° F. after being stored at 155 degrees, and at minus 25 after being



Maj Gen David P. Gibbs

Ent AFB, Colo.

General Gibbs' citations include the Legion of Merit, the French Croix de Guerre with Palm, the Bronze Star Medal with two Oak Leaf Clusters, and the Army Commendation Ribbon.

stored at minus 40. Under interference, shock and humidity tests, it performed equally well.

Operational simplicity is provided by the general purpose programming and maintenance control panel, requiring minimal computer knowledge. Maintenance operations are minimized with readily replaced transistor circuit modules and built-in test routines.

The first model of Basicpac has been in operation more than a year at Fort Monmouth, requiring only minor adjustments, and two other models have proved successful in fire-control operation tests at Fort Huachuca, Ariz., for six months.



Col James M. Kimbrough, Jr., CO, U.S. Army Electronics Laboratories, Fort Monmouth, N.J., sits at Basicpac controls as Dr. Dean Wanlass, Philco Corp. vice president, explains system.

## 28 OCRD Officers Slated For Promotion to Lt Col

Twenty-eight officers assigned to the Office of the Chief of Research and Development (OCRD) have been selected for promotion to the grade of lieutenant colonel, as announced in Department of the Army Circular 624-26, dated Nov. 6.

Named within the U.S. Army Research Office are Norman R. Rosen, Research Programs Office; John C. McWhorter, Life Sciences Division; Thomas T. Tackaberry, Human Factors Research Division; Gunther A. Brumme, Research Planning Division, and Keith G. Comstock, formerly with the Physical Sciences Division.

Special Weapons Directorate selectees are David T. Baker and John B. Dayton, Atomic Office; Robert S. Daniel, Jr., Zeus Office, and Hal E. Hallgren, Space Office.

Director of Developments selectees include Edmund K. Ball, Paul R. Kaster, Jr., and Paul E. Killpack, Air Mobility Division; James K. Hoey, U.S. Standardization Group, Canada; Paul A. Kelley, Air Defense Division; Samuel C. Skemp, Jr., Benjamin B. Williams, Combat Materiel Division.

Plans and Programs Directorate nominees are James H. Carroll, Jr., Robert V. Lee, Jr., and John A. Todd, Plans Division; John G. Parker, Policy Division; William C. S. Simpson, Harris H. Woods, and C. M. Zilian, Programs and Budget Division.

Other selectees include Stephen L. Conner, Jr., Review and Analysis Office; Alfred B. Hale and Paul J. Mueller, Jr., Special Warfare Office; Louis G. Hergert, Jr., Secretariat, Army Scientific Advisory Panel; and Robert M. Rose, Technical and Industrial Liaison Office.

### HumRRO Scientists Take Course

Three scientists with the Human Resources Research Office at the George Washington University recently completed a 3-week training course in Foreign Area Analysis and Latin American Regional Studies at the Foreign Service Institute, Department of State.

Dr. Alfred J. Kraemer, Senior Staff Scientist of Project Special Warfare, and Dr. Edward C. Stewart and Dr. Robert J. Foster enrolled in the course in preparation for visits to various countries to observe counter-insurgency activities and to determine training requirements and objectives for civic action personnel.

## Maj Gen Scofield Retires After 33 Years Service

Maj Gen Herbert L. Scofield, Deputy Chief Signal Officer since July 1, 1962, and an Army officer since 1929, retired from the Army Dec. 31.

Prior to his current assignment, General Scofield was Chief, Procurement and Distribution, Office of the Chief Signal Officer, Washington, D.C.

Commissioned from ROTC at the University of Michigan, where he received his B.S. degree in electrical engineering in 1929, General Scofield was ordered to active duty as signal officer at Fort Dix, N.J., in 1940.

In WW II, he served as signal supply officer of the Trinidad Section Base Command; CO of the Trinidad Signal Depot; signal supply officer of the Trinidad General Depot and subsequently of the Puerto Rico General Depot; and port signal officer of the Port of San Juan, respectively.

After the war, General Scofield joined the Office of the Chief Signal Officer, and in April 1949, became Chief of the Depot Branch of the Pro-



Maj Gen Herbert L. Scofield

curement and Distribution Division. He later commanded the U.S. Army Base Command at Fort Shafter in Hawaii prior to assuming command of the General Depot in Ogden, Utah.

## RAC Adds Dr. Peltier to Operations Staff

Dr. Louis C. Peltier has joined the Operations Logistics Division of the Research Analysis Corporation, Bethesda, Md., as an operations analyst.

Headed by Frank A. Parker, the Research Analysis Corporation is an independent, nonprofit organization. Funded principally under an Army contract, RAC applies operations research and systems analysis to the study and solution of global military problems and related political, social and economic questions.



Dr Louis C. Peltier

Dr. Peltier was formerly senior economist at the Midwest Research Institute. Before joining MRI in 1959, he spent nearly two years as program officer for the Office of Area Development, U.S. Department of Commerce. From 1950 to 1953, he was a geographer with the Office of the Quartermaster General.

From 1947 to 1955, he was a professor of geology at Washington University of St. Louis and previously taught geography and geology at Bucknell University. Recently he has served as a lecturer at various military institutions and schools. From 1943 to 1946, he was a Communications Officer in the U.S. Navy.

Dr. Peltier received his B.A. degree from Clark University in 1937, an M.A. in geology in 1939 from Columbia University, and another M.A. in geology and geography from Harvard University in 1942. He received his Ph. D. from Harvard, also in geology and geography, in 1948.

A member of the American Geophysical Union, the American Meteorological Society, and the Association of American Geographers, he also belongs to the Geological Society of Washington and is a member of Sigma Xi. He has served on various committees and panels of the now defunct Department of the Army Research and Development Board.

# Army Announces Contracts Totaling More Than \$240 Million

Contract awards totaling more than \$240 million for development and procurement of military materiel were announced recently by the Department of the Army.

The largest contract, \$53,921,660, was awarded to the Martin Co., Orlando, Fla., for continued production of the Pershing weapons system. The contract calls for artillery sets, test and checkout equipment and ground support equipment.

Martin Co. also received a \$999,985 contract to study a ballistic missile defense concept for the Advanced Research Projects Agency as part of Project Defender.

A contract for approximately \$44 million let to FMC Corp., Charleston, W. Va., calls for production of three types of air transportable full-tracked vehicles. FMC will manufacture the M-107 heavy self-propelled full-tracked vehicle mounting a 175 mm. gun; the M-110 heavy self-propelled full-tracked vehicle mounting an 8-inch howitzer, and the T-120E1, a new full-tracked armored recovery vehicle.

Three contracts aggregating \$14,848,764 were awarded to General Motors Corp., Indianapolis, Ind., and Cleveland, Ohio, for 720 transmission assemblies for the M60A tank, spare parts for the T-114 armored reconnaissance vehicle and continued development of the XM-551 General Sheridan experimental tank including four additional pilot models.

Contracts for explosives, propellants and ammunition components include: Remington Arms Co., Inc., Bridgeport, Conn., two contracts totaling \$18,509,046; Hercules Powder Co., Wilmington, Del.; two contracts totaling \$12,024,968 (contracts also call for rocket motors); Sperry Rand Corp., N.Y.C., \$8,653,934 (Sperry Rand also received a \$1,723,614 definitizing letter contract for 190 flight control systems for aircraft);

Holston Defense Corp., Rochester, N.Y., \$8,343,250; Day and Zimmerman, Inc., Philadelphia, Pa., \$7,061,906; Olin Mathieson Chemical Corp., N.Y.C., \$6,744,535; Harvey Aluminum Sales Co., Inc., Torrance, Calif., \$5,694,671; Aerojet General Corp., Downey, Calif., \$5,600,000; AVCO Corp., Richmond, Ind., \$2,586,146; and Minneapolis Honeywell Regulator Co., Hopkins, Minn., \$1,000,000.

Two contracts aggregating \$4,939,500 went to Raytheon, Co., Lexington, Mass., for Hawk system components. For engineering services on the

Hawk system, Belock Instrument Corp., Long Island, N.Y., received a \$1,882,312 contract.

American Hoist & Derrick Co., St. Paul, Minn., received a \$6,253,451 contract for 219 truck mounted crane shovels. Production of electronics equipment is the basis for contracts of approximately \$4,500,000 and \$2,000,000 received respectively by Control Data Corp., Minneapolis, Minn., and APEX Corp., Redwood City, Calif.

For tank track shoe assemblies, Firestone Tire & Rubber Co., and Goodyear Tire & Rubber Co., both of Akron, Ohio, received contracts of \$4,368,922 and \$2,878,211 respectively.

Thiokol Chemical Corp., Bristol, Pa., received a \$4,413,839 contract for Nike Hercules sustainer motors.

For electronic training devices and field support of the Nike Hercules weapons system, Western Electric Co., N.Y.C., received two contracts totaling \$2,944,712.

Budd Co., Inc., Long Island City, N.Y., received two contracts aggregating \$2,618,402 for 2,695 radio receiver transmitters and 2,016 lightweight radio sets.

## Army's New Missile B System Renamed LANCE

LANCE is the name selected by the Army for its new missile system, previously known as Missile B.

Scheduled to replace the Honest John and LaCrosse, LANCE will greatly increase the nuclear and non-nuclear fire support capability and effectiveness now available to divisions in the field.

LANCE is designed for use in gen-

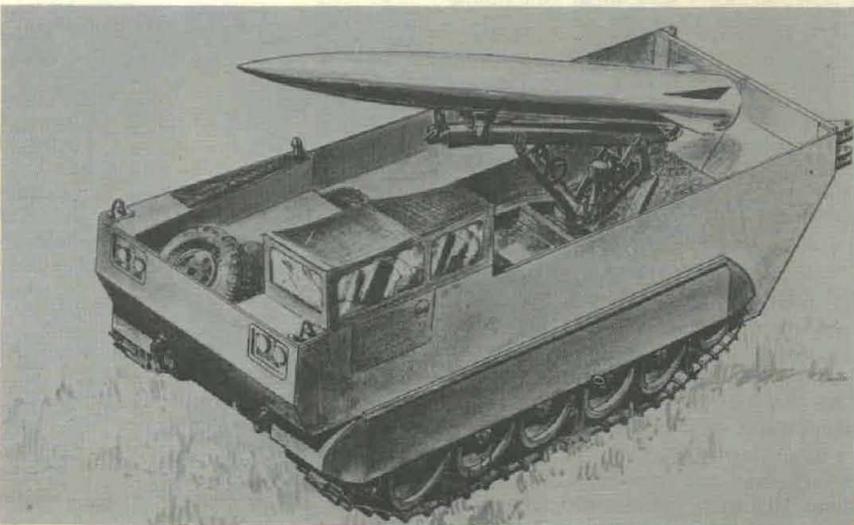
A \$2,422,394 contract let to Emerson Electric Manufacturing Co., St. Louis, Mo., is for development of a helicopter armament system. Parsons Corp., Traverse City, Mich., received a \$1,369,678 contract for helicopter blades.

Additional contracts included: Cornell Aeronautical Laboratories, Inc., Buffalo, N.Y., \$1,817,000 to study effective means of delivering chemical agents; Eagle Pitcher Co., Willoughby, Ohio, \$1,455,777 for tank track assemblies; Chrysler Corp., Dayton, Ohio, \$1,293,858 for range finders for the M-60 main battle tank; Norris-Thermador Corp., Los Angeles, Calif., \$1,281,600 for projectile mental parts; Space Corp., Garland, Tex., \$1,241,296 for shipping and storage containers;

Armstrong Rubber Co., West Haven, Conn., \$1,143,709 for pneumatic tires; Canadian Commercial Corp., Ottawa, Canada, \$1,058,107 for anti-personnel mine metal parts; ACF Industries, Inc., New York, N.Y., \$999,682 for 100 railway petroleum tank cars; and DOC-O Manufacturing Corp., Sand Springs, Okla., \$879,904 for 506 water trailers.

eral and limited war and will operate in all types of terrain and weather. Its development marks the first use by the Army of a pre-packaged liquid propellant.

Prime contractor for LANCE is Chance Vought Corp., a division of Ling-Temco-Vought. The Army Missile Command at Redstone Arsenal, Ala., is managing the program.



Artist's concept of Lance, Army battlefield missile under development.



Army scientist Dr. Charles Bruce Lee receives Meritorious Civilian Service Award from Maj Gen Alden K. Sibley, Commanding General of the U.S. Army Mobility Command. Brig Gen John G. Gramzow, left, is Commanding General.

## ATAC Employee Cited for Meritorious Service

Dr. Charles Bruce Lee, presented the Army Meritorious Civilian Service Award at a recent ceremony at the Army Tank Automotive Center Arsenal in Warren, Mich., is believed the first ATAC employee to be so honored.

Maj Gen Alden K. Sibley, Commanding General of the U.S. Army Mobility Command, made the presentation of the Department of the Army's second highest civilian service award. Dr. Lee is a human factors analyst in the Research and Engineering Directorate.

The citation, based upon a 2-year study stated in part: "He has demonstrated outstanding ability in developing basic procedures for microbiological test programs on the Redstone, Honest John and Jupiter C missiles."

Witnessing the presentation of a bronze medal, a lapel rosette and citation certificate were Brig Gen John G. Gramzow, Commanding General of ATAC, Col Morton McD Jones, Jr., Director of ATAC's Research and Engineering Directorate, and many of Dr. Lee's coworkers.

According to all available historical records, Dr. Lee holds the distinction of being the first ATAC recipient of the award while still employed by the Army. He is rated as an expert in the study of the effects of fungal deterioration on ordnance materials.

A native of Buffalo, N.Y., he has been associated with ATAC for more than 10 years. He received his B.S., M.S. and Ph. D. degrees from the

University of Michigan and has completed graduate work at the Universities of Purdue, Minnesota, and the Oak Ridge Institute of Nuclear Studies at Oak Ridge, Tenn.

While employed at ATAC, he received several awards under the ATAC Suggestions Awards program. In August of 1961 he won a cash award for coauthoring an article titled "An Evaluation of College Curricula for Industrial Orientation in Microbiology," published in Volume XI of the American Institute of Biological Sciences Bulletin.

Dr. Lee then was serving as a member of the Education Committee of the Society of Industrial Microbiology. A similar award was conferred on him in 1962 for an article on fungal deterioration which appeared in the 1962 proceedings of the Institute of Environmental Sciences.

Professional and honorary society memberships of Dr. Lee include the University of Michigan Chapter of Sigma Xi; the Science Research Club of the University of Michigan's Honorary Mens Association; the Phi Sigma Biological Society; the American Institute for Biological Sciences; the Gamma Alpha Honorary Scientific Fraternity and many others.

Dr. Lee finds time to serve on the evening staffs of Wayne State University and the University of Detroit. His wife is also a doctor. She specializes in internal medicine and has her own private practice. They have four boys and two girls, ranging in age from one to 12 years.

## DSA Assigned Inventory Of Idle Industrial Plants

The Defense Supply Agency is scheduled to begin assuming responsibility Mar. 1, 1963, for maintaining the central Department of Defense inventory of all idle industrial plant equipment owned by the DoD, valued at \$1 billion.

Secretary of Defense Robert S. McNamara directed the change, announced Dec. 20. The DSA will work with the Military Departments to assure prompt identification and reporting of idle assets to the inventory.

Under procedures to be developed by the DSA and the Military Departments, new production equipment will be screened against the idle assets for possible interservice exchange to preclude procurement wherever possible.

DSA will develop and publish uniform codes for industrial equipment in order to establish a uniform inventory reporting and record keeping system for all such equipment in the Department of Defense.

DSA will also become responsible for storage, movement, preservation, and rebuild of idle plant equipment. As agreed with the Military Department, DSA will perform central purchasing of equipment when this is the most economical method, and prepare Department of Defense specifications covering general purpose industrial production equipment.

## Defense Supply Agency Gets Chemical Items Management

Supply management responsibility for approximately 6,000 items of chemical materials has been assigned to the Defense Supply Agency.

The Department of Defense announced that chemicals, dyes, compressed gases, gas cylinders, solid and gas fuels, pest control agents, disinfectants, hydraulic and cutting oils, miscellaneous greases and oils will be managed by DSA's Defense Petroleum Supply Center in Washington.

The Defense Medical Supply Center, Brooklyn, N.Y., will manage laboratory equipment and chemical analysis instruments.

Previously many of these materials, estimated annual procurement of which amounts to \$95 million, were procured by each Service.

The move to consolidate and centralize management of these items is in support of Secretary of Defense Robert S. McNamara's program to improve effectiveness and economy in military procurement and supply.

## SORO Director Announces 2 Key Appointments

Dr. Philip I. Sperling is the new Deputy Director of the Special Operations Research Office (SORO), the American University, and Dr. Earl H. DeLong is the Assistant Director for Requirements and Applications.

SORO Director Dr. Theodore R. Vallance announced the appointments. He stated that Dr. Sperling will participate in all aspects of management, including the planning, conduct and evaluation of both research and administration.

Under an Army contract, SORO conducts social science research related to counterinsurgency and other cold war activities. The multi-disciplinary studies describe and interrelate the social, political, economic and military background for foreign countries.

Dr. Sperling was formerly Chief of the Neuropsychiatry and Psychophysiology Branch, and Assistant Chief of the Program Planning Office for the Army Medical Research and Development Command.

Born in Brooklyn, N.Y., and trained

in psychology at Columbia University and the University of Michigan, he served in the aviation psychology program of the U.S. Army Air Forces in World War II. After separation, he served five years on the faculties of the University of Michigan and Bennington College, then joined the research and development program of the U.S. Air Force in 1951. In 1956 he joined the Army Surgeon General's Office as a research administrator.

DR. DeLONG received his B.S., M.A., and Ph. D. degrees in political

sciences at Northwestern University. After serving on Northwestern's faculty for eight years, he began his extensive career with the Government. During World War II he served in the U.S. Marine Corps as an enlisted man and as an officer.

Upon separation from the Armed Forces, he worked with the Veterans Administration for three years. In 1948 he joined the Department of Defense and carried out assignments related to organization development. Beginning in 1950, Dr. DeLong worked nine years for the Central Intelligence Agency. In 1959 he joined the staff of SORO as Technical Director for the research program.

## ICAF Cites Correspondence Course Honor Graduate

Melvin P. Parks, a Military Research Management Officer with the U.S. Army Materials Research Agency in Watertown, Mass., was cited recently for completing with honors a correspondence course of the Industrial College of the Armed Forces.

Vice Admiral Rufus E. Rose, USN, Commandant of the ICAF, commended Mr. Parks for scholastic achievement in the 1-year course, open to

qualified civilians in Government, business, industry and the professions as well as to military officers.

Operating under the direction of the Joint Chiefs of Staff, the ICAF devotes itself to the study of the economic and industrial aspects of national security under all conditions and in the context of both national and world affairs.

The ICAF courses also give consideration to the interrelated military, logistical, administrative, scientific, technological, political and social factors affecting national security.

The correspondence course, titled "The Economics of National Security," is based on the curriculum of the resident course conducted at Fort Lesley J. McNair, Washington, D.C., for senior military officers and Federal Government officials.

Texts and instructional materials in the correspondence course are provided at no cost to the student. Interested persons may address applications to the Commandant, ICAF, Washington 25, D.C.



Melvin P. Parks

## USARO Personnel Present Papers at AAAS Meeting

Four papers authored by U.S. Army Research Office personnel will be presented at the meeting of the American Association for the Advancement of Science (AAAS) in Philadelphia, Pa., Dec. 26-31.

Dr. Leonard S. Wilson, Chief, Environmental Sciences Division, will introduce the papers which delineate scientific research conducted by the Army to enhance military operations in the extreme environments.

Authors and titles of the papers are: Maj David A. Beckner and Dr. Leo Alpert, Tropical and Desert Branch, "Humid Tropics and Desert Research and Development Program of the Army"; Donald C. Hilton, Polar and Arctic Branch, "Army Research and Development for the Cold Regions"; Dr. Hoyt Lemons, Chief, Geophysical Sciences Branch, "Earth Sciences Research in the Army"; and Lt Col Richard Terwilliger, Geophysics Branch, "Atmosphere Research and Development in the Army."

The papers form a major portion of the General Session for Contributed Papers in Geography (Part II) of the AAAS's Section E (Geology and Geography), meeting with the Geological Society of America and the Association of American Geographers.

## Flub Credits Watervliet for Watertown Arsenal Work

During the two years since the *Army Research and Development Newsmagazine* was launched, Watertown Arsenal, Watertown, Mass., has reported on numerous research and development advances interesting to our readers.

Watervliet Arsenal, Watervliet, N.Y., likewise has contributed much newsworthy information on its research and development activities. To both of these important U.S. Army installations, the editor acknowledges an abiding appreciation for their continued cooperation in reporting gains.

Unfortunately, someone flubbed in

an article in the October 1962 issue of this publication by "robbing Peter to pay Paul"—that is giving credit to *Watervliet Arsenal* for work actually performed by *Watertown Arsenal*.

The article on page 28 of that issue, titled "*Watervliet Cuts Production Time Using Plastic Tooling*," was correct in every respect save one. *Watertown Arsenal* Public Information Officer Bennett D. Carlson conveyed his appreciation for a fine article—along with a request that a correction be carried in this issue.

The editor regrets the error.

## Plastic Bandoleer Designed To Carry 40 mm. Projectiles

Plastic bandoleers capable of holding projectiles fired with the M-79 40 mm. grenade launcher are being developed by the U.S. Army Plastics and Packaging Laboratory, Picatinny Arsenal, Dover, N.J.

Each 1½ x 4-inch grenade weighs about a half pound. Picatinny project engineer James Spilman designed a plastic pouch capable of carrying three grenades, worn over the chest crisscross style. An average soldier may carry as many as 12 pouches without being unduly encumbered.

A high-density ethylene co-polymer plastic was chosen for the bandoleer because of its resistance to thermal stress cracking and its ability to withstand extreme hot and cold climates. The container also is molded easily and stands up well under impact tests.

To test the ammunition in its "nest," 12 plastic pouches are packed in corrugated cartons, overpacked within a moisture-proof bag and placed in a wirebound wood box. The package has withstood drops from three feet without damage to the contents. It also has been parachuted from a plane without damage to the ammunition.

The pouch has successfully withstood bare drop tests without benefit of outer packing to protect the fragile aluminum nose of each grenade. This simulates actual field conditions where a soldier might accidentally drop the ammunition.

The shoulder-fired grenade launcher system is capable of destroying enemy machinegun nests, bunkers and small troop concentrations more than 400 yards away. The high-explosive grenade differs from previous rifle grenades in that it detonates upon contact, rather than relying on a time fuze.



Plastic bandoleer designed to ease load in carrying 40 mm. projectiles.

## Updated COBOL-61 Report Slated for Release

COBOL-61 Extended, a revised report on a Common Business Oriented Language, is scheduled for publication early in 1963. It updates but does not supersede COBOL-61, more than 13,000 copies of which have been sold by the Government Printing Office since it was issued in June 1961.

Principal extensions consist of specifications for a report writer function, and for sorting.

Of the over 1,000 computers in use by the Federal Government for management-type functions in Fiscal Year 1962, the Department of Defense had 626 in use at 246 locations.

The extended report was submitted by a committee of the Conference on Data Systems Languages, a voluntary group composed of representatives of computer manufacturers, the Department of Defense, and other major users of computers.

Thomas D. Morris, Assistant Secretary of Defense (Installations and Logistics), is Chairman of the Executive Committee. Commenting on the revision, he said:

"The pressing need for programing techniques such as COBOL is felt more keenly as time progresses and as hardware technology enhances the application of computers to management needs. The voluntary effort of manufacturers and users in this highly competitive and dynamic field to develop the common language, which is powerful and open-ended to permit augmentation, indicates a recognition of the need for a language which

permits capitalizing on improvements."

Through the use of the COBOL method of programing, it is anticipated that in addition to interchanging programs among installations which use different makes and models of computers, it will be possible to reduce the time and costs that have been involved in writing programs for the newer equipment.

## New York Editors Give Talks To Munitions Command PIOs

U.S. Army Munitions Command public information officers listened to noted New York journalists present their views on how the Army can carry its research and development story to the public at a recent conference.

About 40 Army officers and civilians heard William B. Arthur and Richard Slawsky explain the type of news material they like to receive. Arthur is Managing Editor of *Look Magazine* and Slawsky is Science Editor of the *New York World Telegram and Sun*. During World War II, Arthur was Chief of the Press Branch of the War Department Bureau of Public Relations.

The 2-day conference was the first gathering of information officers to discuss their problems since the Munitions Command was activated. During the workshop sessions a panel of newspaper and radio representatives offered suggestions on improving the Army information program.

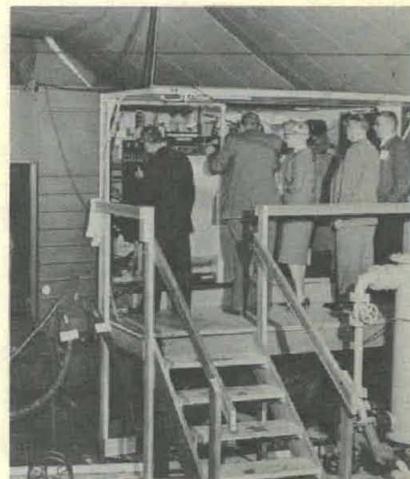
## Progress Reported on Water Purification Method

Water purification progress through research is reported by the Engineer Research and Development Laboratories, U.S. Army Materiel Command, Fort Belvoir, Va.

A truck-mounted ion exchange unit that uses a solid rather than a liquid chemical is being developed. The unit uses sulfamic acid instead of hydrochloric acid to regenerate exchange resins in water demineralization and decontamination.

A solid chemical dissolved in water on-site eliminates many of the problems, particularly that of transportation, associated with the handling of liquid acids.

The mobile ion exchange unit is designed for use with the Army's Erdlator water purification equipment. The Erdlator process removes mud, bacteria and other suspended material from water. The ion exchange unit demineralizes and removes dissolved radioactive materials.



New 1,500 g.p.h. mobile water purification unit is demonstrated during 2-day Medical Education for National Defense Program held at U.S. Public Health Service facilities in Cincinnati.

## Preventive Medicine Researcher Wins Gorgas Medal

In recognition of his outstanding contributions to preventive medicine, Lt Col William S. Gochenour, Jr., has been awarded the 1962 Gorgas Medal by the Association of Military Surgeons.

Formerly with the U.S. Army Medical Unit, Fort Detrick, Md., and now serving with the Desert Test Center, Fort Douglas, Utah, he has been engaged in research on infectious disease since 1949.

The Gorgas Medal award, consisting of a silver medal, citation and an honorarium of \$500, commemorates Surgeon General William Gorgas who fought against yellow fever during the Panama Canal construction.

Dr. B. J. Gray, vice president of Wyeth Laboratories, Philadelphia pharmaceutical manufacturer that sponsors the award, made the presentation at recent ceremonies in Washington, D.C.

Several aspects of Lt Col Gochenour's research have had practical application in diagnosis and prevention of a variety of illnesses, Dr. Gray pointed out. His studies on "Q" fever, a major problem in Allied Forces in the Mediterranean area during WW II, demonstrated the effectiveness of the Smadel-Jackson vaccine against airborne infection and helped specify the drugs of choice and the most appropriate times for their use in treating the disease.

A doctor of veterinary medicine who specializes in the microbiology and aerobiology of animal disease which may spread to man, Lt Col Gochenour was also cited for a long list of major contributions to the identification, diagnosis and treatment of such diseases as anthrax, tularemia and leptospirosis.

"Respiratory anthrax, like pneumonic plague," Lt Col Gochenour said, "can be successfully treated. Early treatment is essential. Delay of but a few hours permits the course of the disease to become irreversible and death from anthrax is then inevitable."

As a result of his experimental work, the spread of leptospirosis can now be better controlled through public health measures, and improved diagnosis can often lead to earlier recognition of the disease and hence more effective treatment.

A 1937 graduate of the University of Pennsylvania School of Veterinary Medicine, he has served in the Veterinary Corps since 1939. Previously, he



Lt Col W. S. Gochenour receives Gorgas Medal for distinguished service to preventive medicine from Dr. Gray.

worked for the U.S. Department of Agriculture and as a research veterinarian for the Pitman-Moore Co.

He served in the Philippines during World War II and since then has concentrated on medical research. Recognized as a world authority on microbiological aerosol sampling and on the immunology, prophylaxis and treatment of airborne disease, he is a Fellow of the American Board of Veterinary Public Health and of the American Association for the Advancement of Science. He is also a member of the Association of Military Surgeons and other societies.

## APA Publishes Monograph on Army Stress Studies

"Experimental Studies of Psychological Stress in Man" is the title of a monograph on research conducted by Army psychologists published recently by the American Psychological Association.

Based on studies accomplished over several years, the report is written by Mitchell M. Berkun, Hilton M. Bialek, Richard P. Kern and Kan Yagi of the U.S. Army Leadership Human Research Unit, Presidio of Monterey, Calif.

Task FIGHTER, a continuing research project which provided information for the monograph, is under the technical supervision of the Human Resources Research Office (HumRRO), George Washington University. It is monitored by the Human Factors Research Division, U.S. Army Research Office.

The project developed when evidence gathered in WW II and the

## Army Surgeon Gets Award For Aerospace Medicine

Col Robert H. Holmes, an Army surgeon for the Defense Atomic Support Agency (DASA), recently received the American Medical Association's Special Aerospace Medicine Honor Citation.

Chief of DASA Maj Gen Robert H. Booth presented the award to the colonel and praised him for his outstanding contributions in the successful orbital flights of U.S. astronauts.

While Chief of Biophysics and Bioastronautics in the Army Surgeon General's Office, he was project officer for the suborbital flights in 1959 of the monkeys, Able, Baker and Old Reliable.

Col Holmes entered the Army after earning his M.D. degree at Tulane University Medical School in 1940. Subsequently he served residences in pathology at Brooke General Hospital, Fort Sam Houston, Tex., the Armed Forces Institute of Pathology, and Duke and Harvard Universities.

His experiences as an Army medical officer ranges from commanding a field hospital during WW II in Europe to heading the Biophysics and Astronautics Research Branch of the U.S. Army Medical Research and Development Command in 1959.

As a civilian, he served from 1954 to 1957 as Director of the Atomic Bomb Casualty Commission in Hiroshima, Japan.

Korean War revealed that a meaningful percentage of soldiers in a position to do so did not fire their weapons at the enemy. In 1952, the Army asked HumRRO to investigate the problem.

Initial experimental situations simulating some of the psychological stresses of combat had little success because the soldiers were aware the Army would not needlessly expose them to real danger. Task FIGHTER was developed when credible situations were needed which produced clear objective changes in performance and the physiological responses characteristic of stress.

The monograph delineates the situations developed and the responses in subjects. It provides the guidelines for future research toward fulfilling the ultimate goal of devising techniques for training soldiers to cope more readily with combat situations.

## Redstone Chemists Grow Precious Gems For Use In Army Laser Research

Better and less expensive precious gems for use in Army research projects is the aim of Charles Nixon, a chemist in the Army Missile Command's Electromagnetics Laboratory, Redstone Arsenal, Ala.

By using heat producing equipment to create an induction plasma, Nixon grows rubies for experimental model Lasers. Laser denotes Light Amplification by Stimulated Emission of Radiation, a process which uses ruby rods to focus light into a narrow, intense beam useful as a radar or long range communications device.

A new research development, the induction plasma process for manufacturing rubies uses highly excited gas molecules producing concentrated heat exceeding the sun's temperature.

According to Nixon, the induction plasma furnace compresses 4 days' sunshine into 10 minutes, reaching temperatures up to 28,000° F. To eliminate any danger of overexposure, the furnace has been shielded.

To grow rubies, Nixon lights the furnace and pours aluminum oxide powder mixed from chrome oxide down a tube into the flame. The powder, upon contacting the flame, vaporizes and then falls. When the vapor leaves the flame it condenses, similar to rain, and then falls into an asbestos cup below the flame. The falling liquid forms an upside-down icicle similar to the formation of a stalagmite when the lime in cave water hits the ground.

The rubies grow about an inch an hour, according to Nixon; and, he explains, the amount of chrome oxide added to the aluminum oxide determines how red the ruby will be.

A crop of several rubies, sapphires and Shelite (a form of tungsten crystal) already have been grown in the plasma machine. The induction plasma can also be used to raise zircons and titanium crystals. (The production of diamonds from common graphite is reported in the April 1962 issue of this publication.)

Nixon's experimental models are about half the size of a man's thumb, "but the next crop," he believes, "should be larger, now that we know more about the process."

Nixon's ruby culture represents a breakthrough in the process of producing artificial crystals, according to Army Missile Command Headquarters. The common process is flame fusion, mixing hydrogen and oxygen



Charles Nixon of the Electromagnetics Laboratory, Army Missile Command, watches induction plasma flame grow a ruby (the white lump).

at much lower temperatures to produce artificial crystals.

Both methods of ruby growing are being investigated, Nixon explained, "but the induction process looks like it will give us larger and better quality rubies for less cost."

Employed by the Missile Command since 1958, Nixon has been ruby farming for about a year before he harvested his first crop. He received his B.S. degree in chemistry from San Jose State University, Calif.



**CENTURIES OF CONTRAST** — Lt Emil Senkowski, encapsulated in U.S. Army's experimental protective clothing ensemble, the "thermalibrium" suit, checks over plate armor relic from the days of knighthood. The temperature and humidity of the uniform are thermostatically controlled by mechanical air conditioning and dehumidifying equipment, using a power source integral with the clothing. The Army's Quartermaster Research and Engineering Command, Natick, Mass., is studying the system to provide the soldier with his own "built-in" climate and at the same time afford a measure of protection from a variety of field hazards.



By Ralph G. H. Siu

**TALENT SEARCH.** There is no more talked about subject in R&D circles nowadays than "bringing in new blood," "discovering young talent," and "improving conditions for creativity." The whole undertone seems to be that the organization can so change its regulations, administrative practices, physical environment, and monetary rewards that talent automatically is attracted to it.

Notably absent from these discussions is the question of *who* is to be the discoverer of talent. And *how*. The following story reveals the details of one example of how it has been accomplished:

Browsing through the crowded shelves of a secondhand bookshop in Chicago in search of something to read on the train back to New York, publisher Pascal Covici came across a volume of short stories by a young, unknown author. Originally priced at \$2.50, it has been marked down to 10 cents—so he bought it.

Covici liked the book so much that as soon as he reached New York, he telephoned the author's agent. The agent was unable to tell him very much about the young man except that he lived in California and that his latest work had been rejected by seven publishers. Covici read the manuscript, liked it and published it.

The novel was "Tortilla Flat"; the author, John Steinbeck.

**PRINCIPLES AMONG THIEVES.** According to Chuang-Tzu, the apprentice to the robber Cheh asked him whether or not there are principles among thieves.

Robber Cheh replied, "There is the sage character of thieves by means of which booty is located, the courage to enter first, and the chivalry to come out last. There is the wisdom of calculating success and the kindness in fair division of the spoils. There has never yet lived a great robber who did not possess these five qualities."

A friend of mine suggested that the same qualities are present among great researchers wresting scientific secrets from nature.

# QM Developing 'Tilt' Cargo Parachute Release Device

By Michael J. Lynch

To the tamperer of pingall games "tilt" represents impending penalty—but to the Army field commander who relies upon airdropped supplies and equipment, the word may soon symbolize elimination of the chance penalty sometimes met during airdrop operations. A cargo parachute disconnect device, being tested by the U.S. Army, may solve an old airborne problem.

Plagued too long by erratic performance of cargo parachute automatic release components of airdrop systems, combat forces have been compelled to accept a relatively high equipment "mortality" as the necessary price for this essential method of swift delivery. These critical release components are separable mechanical links installed between the load and parachutes to disconnect the parachutes upon landing of the cargo.

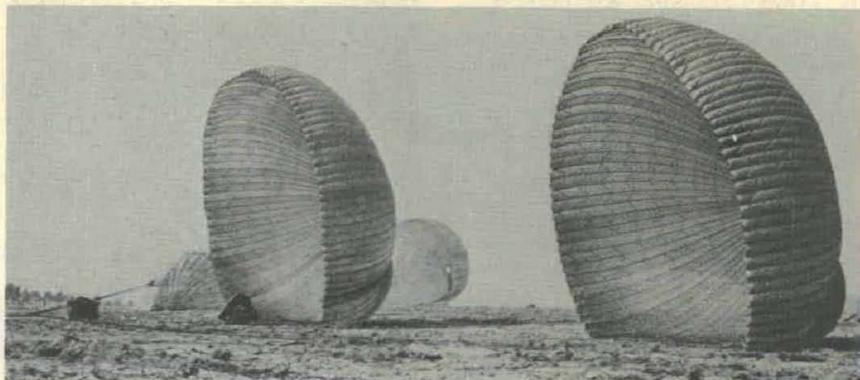
Failure to disconnect large cargo recovery parachutes at the instant of ground contact allows parachutes to pull over in ground winds, and to topple and frequently damage urgently needed supplies and equipment. The principal reason for failure of earlier release mechanisms to operate reliably is that they were designed to the "load relaxation" concept. The mechanism consisted essentially of a spring-loaded locking arm which was opposed by tension of the suspended cargo. Upon landing, tension would reduce to release the parachutes.

These releases could not function reliably in winds over 15 knots without critical pre-adjustment. Instead, as the cargo landed, the parachute immediately pulled over and remained inflated, preventing the required relaxation of tension of the suspension risers.

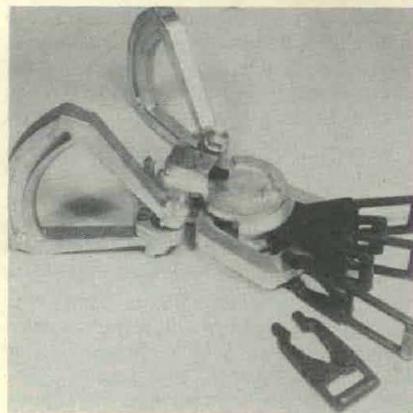
Several attempts to improve operation of "load relaxation" release mechanisms produced only marginal improvements. The most successful effort resulted in a release mechanism which can accommodate single parachutes over a limited weight from 1,300 to 5,000 pounds.

By using multiple units of these releases, cargoes weighing over 10 tons have been airdropped with reasonably good results. Various other proposed and investigated designs involved very narrow ranges of allowable cargo weights, or introduced difficult rigging problems.

To achieve the required wide load range, a capacity of 35,000 pounds, and to permit dropping in ground



"Tilt," new Army-developed release mechanism (shown on right), is expected to overcome the old airborne problem of damage to loads dragged by parachutes (as shown here) due to failure of disconnect devices. "Tilt" operates through unequal tensions which occur in the suspension slings upon ground impact of the cargo. Relaxation of tension causes the body of the release mechanism to rotate or tilt. When tilted beyond a critical angle, a toggle within the mechanism is rotated, disconnecting the connector or "fingers" and releasing load.



winds up to 30 knots, a new concept of automatic cargo parachute release mechanism is under study at the Quartermaster R&E Command at Natick, Mass. Nicknamed "Tilt," it will require no maintenance or lubrication, and lends itself to production fabrication methods.

The concept will take advantage of the unequal tensions which always occur in the cargo suspension slings as the load lands. This difference in tension causes the body of the release mechanism to rotate or to "tilt." When tilted beyond a critical angle, a toggle within the release body is rotated. As the toggle rotates, the space in which parachute connectors are retained is increased, and the connectors (or "fingers") are disconnected.

An additional feature of the "tilt" release is an integral hydraulic time delay. A time delay is required to prevent premature release of the device during the initial, unstable portion of the airdrop. Earlier releases employed pyrotechnic delay cartridges which required replacement for each use. The hydraulic delay of the "tilt" release is reusable and requires no maintenance.

Recent testing of a 9,000-pound ca-

capacity proof-of-principle prototype was completely successful. In addition, testing of a 20,000-pound capacity prototype is in progress, and results to date indicate that continued development up to the required 35,000 pounds is feasible.

## Flashlight Battery Powers Army's New 'Handie-talkie'

A small, lightweight power supply for Army radios being tested at Ariz., may simplify battery problems.

As every owner of a battery-operated radio knows, getting the right replacement battery is often troublesome and expensive. The same is true for the Army's "handie-talkie" transmitter-receiver, which requires a multi-purpose battery.

With the new power supply, however, the "handie-talkie" can be operated on ordinary flashlight batteries. The power supply converts their low voltage—1.5 volts per cell—into the higher voltages required to operate the radio.

A product of the U.S. Army Signal Research and Development Laboratory at Fort Monmouth, N. J., the power supply uses transistors and is about the size of a pack of cigarettes.

## Operation FIST Reports on Computer Findings



Control Section at USAEPG evaluated electronically processed intelligence data during Operation FIST. Left to right, Maj William Raymond, USAEPG; Victor Crosetti, Ramo Wooldridge analyst; Lt Col Charles Brewster, USAEPG.

Although there is no indication that machines will replace people who gather combat intelligence, it has been proved that processing of the information can be done better and faster electrically.

Results of the first engineer design test of intelligence data processing, revealed recently by Army Electronic Proving Ground technicians at Fort

Huachuca, Ariz., promise to be a boon to the commander.

Dubbed Operation FIST (First Intelligence Simulative Test), the exercise demonstrated that electronic computers can provide commanders with more timely, accurate and useful intelligence upon which to base their decisions.

More than 30,000 computer pro-

## Hausman Heads Behavioral Sciences Research

Lt Col William Hausman, MC, who last September became the Army Medical R&D Command's first psychiatrist, has been appointed head of the Command's newly formed Behavioral Sciences Research Branch.

The Branch will monitor all aspects of Army medical research activities in neuropsychiatry and psychophysiology. Some of these are sensory perception, psychomotor activity, human engineering, bio-mechanics, motivation and leadership, fatigue, psychiatric and psychological aspects of military service, environmental and other forms of stress, and basic research in neuropsychiatry.

A native of Brooklyn, N.Y., Col Hausman earned his medical degree from Washington University Medical School, St. Louis, Mo.

While in residency training at the Institute of the Pennsylvania Hospital, he was called to active duty as division psychiatrist with the 24th Infantry Division in Korea. Subsequent assignments have included chief of neuropsychiatry and first chief of the medical research project at West Point Army Hospital, where

he published several research papers.

Prior to assuming his new post, he was Chief of Psychiatry at Letterman General Hospital. He is a member of the American Psychiatric Association, the Association of Military Surgeons, Association of the U.S. Army, Association for the Advancement of Science, and the American Medical Association.



Lt Col William Hausman

gram instructions were written to support the test, participated in by 10 officers and 28 enlisted men of the Electronic Proving Ground and Army Intelligence Center, and six Ramo Wooldridge personnel.

Operation FIST had these objectives:

- To test initial system design principles of tactical intelligence processing and initial design of input and output formats;
- To provide basis for expanding system design to improve intelligence processing and for estimating data processing training requirements for intelligence personnel.

The test was designed to evaluate the principles of automated storage and retrieval as applied to the processing of tactical intelligence. Intelligence automatic data processing is a part of the command control information system—a complex of tactical automated systems for the field army.

The test scenario used in FIST was the intelligence portion of a division command post exercise developed by personnel of the Army Intelligence School, Fort Holabird, Md.

Design of the intelligence system is a joint effort of the Army Electronic Proving Ground, with technical assistance provided by the Ramo Wooldridge Division of Thompson Ramo Wooldridge and of the Army Intelligence Board, recently redesignated the Army Intelligence Combat Development Agency.

## Systemic Blood Flow Study Topic of WRAIR Seminar

Dr. Donald E. Gregg discussed "Control and Distribution of Systemic Blood Flow" at the monthly staff seminar held Nov. 21 at the Walter Reed Army Institute of Research, Washington, D.C.

He outlined the preparations and methods developed to permit studies on the local control of blood flow, blood pressure and metabolism in the resting and/or active unanesthetized animal exposed to the many stresses of everyday life, and to various abnormal and pathological stresses.

Examples cited included the regional effects of mental stress, exercise, posture and reflexes. Especially stressed were energetics of the heart.

Recipient, last summer, of the President's Award for Distinguished Federal Civilian Service, Dr. Gregg is Chief, Department of Cardiorespiratory Diseases.

## Dr. Swingle Heads Weather National Task Group

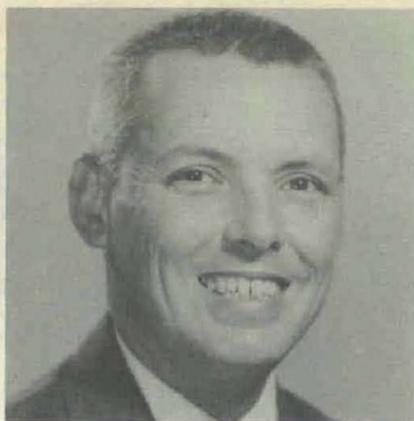
Dr. Donald M. Swingle, a meteorologist at the U.S. Army Electronics Research and Development Laboratory, Fort Monmouth, N.J., is the new chairman of the National Task Group for Mesometeorology.

Composed of 10 scientists from Federal Government agencies, the Task Group is part of the Interdepartmental Committee for Atmospheric Sciences, which reports to the Federal Council for Science and Technology. Dr. Jerome Wiesner, President Kennedy's Science Adviser, heads the Council.

The stated purpose of the Task Group is to plan major programs to foster better understanding of the weather within fairly small geographic areas. Dr. Swingle explained that the study areas may range from two miles to several hundred miles wide and deal with circulation systems that might generate tornadoes and other damaging storms.

Often recognized for his scientific achievements, Dr. Swingle recently was graduated with special distinction from the Industrial College of the Armed Forces in Washington, D.C. He is the first civilian employee from the Electronics R&D Laboratory chosen for the ICAF residence course.

Holder of six university degrees, and a major in the U.S. Army Reserves, Dr. Swingle has a reputation as a linguist capable of communicat-



Dr. Donald M. Swingle

ing in German, French, Spanish, Russian, English and, if necessary, Latin.

Upon graduation from Wilson Teachers College in Washington in 1943 with a B.S. degree in mathematics and scientific education, he became an aviation cadet at New York University. Commissioned as a second lieutenant, he was sent to radar officer courses at Harvard University and Massachusetts Institute of Technology, and later did weather radar research in the Army Air Corps.

After the war he accepted a civilian job as a radio engineer at the U.S. Army Signal Corps Laboratory at Fort Monmouth. His duties involved research in meteorology and develop-

mental work on weather radar sets.

In 1947 he earned an M.S. degree in meteorology from New York University, followed by an M.A. degree in applied physics, a master of engineering science, and a Ph. D. in applied physics, all from Harvard a year apart. His final degree as master of business administration was earned during the same 10-month period he won "outstanding" scholastic honors at the Industrial College.

Although his ICAF thesis was titled "Atmospheric Management: A Tool for National Security," Dr. Swingle is making no outright predictions regarding precise modification of the weather.

"I am looking forward," he said, "to the day when our understanding of the atmosphere will be sufficient to permit us to modify the weather with discrimination and efficiency."

## MEND Holds Symposium On Infectious Disease

Noted representatives of U.S. Army medical research installations were featured speakers at a recent symposium on "Infectious Disease in Biological Warfare and Global Medicine."

Sponsored by the Medical Education for National Defense (MEND) Program, the symposium was held Dec. 12-14 at the Walter Reed Army Institute of Research (WRAIR), Washington, D.C. Faculty members from about 70 medical schools attended.

Dr. Leroy D. Fothergill, Scientific Adviser, U.S. Army Biological Laboratories, made the opening presentation on "General Concepts of the Employment of Biological Weapons." The meeting was climaxed by a talk on "Skin Disease during Military Operations" by Dr. M. B. Sulzberger, Technical Director of Research, U.S. Army Medical Research and Development Command.

The symposium was the second of four to be sponsored by MEND during the 1962-63 academic year to acquaint teachers of medicine with recent research by the Federal Government agencies.

Scientists affiliated with the National Institutes of Health, the Naval Medical Research Institute, the University of Chicago and the University of Maryland were among the speakers. Specialists from the U.S. Army Medical Unit and the U.S. Army Biological Laboratories, Fort Detrick, Md., U.S. Army Medical Research and Development Command, WRAIR and the Office of the Surgeon General, Washington, D.C., also gave papers.

## USAEPG Testing Two New Weather Instruments

Two new weather instruments, one a thunderstorm locator and the other a cloud height measuring device, are being tested at the U.S. Army Electronic Proving Ground, Fort Huachuca, Ariz.

The thunderstorm locator scans a circle 300 miles in diameter by radar, searching for storms before they are visible on the horizon. It is designed to warn field commanders of impending bad weather which could have adverse effects on military operations.

The cloud height measuring device gauges the height of clouds passing directly overhead—important at airports where cloud ceilings must be known to permit safe operations.

While present cloud height measuring equipment is heavy and bulky, the new instrument is light and compact enough to be transported to temporary military airstrips by helicopter. The time in fractions of a second it takes a pulse of light to make the trip to a cloud and back is measured by

the instrument and multiplied by the speed of light to find the height.



Technicians at USAEPG use a line-man's truck and tape measure to check accuracy of new absolute radar altimeter. The instrument is attached to basket of hydraulic boom.

## Directive Prescribes Missile Designation Policy

A uniform system of designating rockets and guided missiles was announced Dec. 18 by the Department of Defense.

Explained in Directive 4000.20, the system will assign letter-number code consisting of three letters, a number and a letter to each existing or future rocket or guided missile with a combat or combat-related mission.

Designators will be assigned to about 65 existing kinds of rockets and missiles, supplanting those assigned under previous systems. Popular names associated with existing guided missiles and rockets are retained.

Space vehicles are not covered by the Directive. Excluded are rocket systems designed for line-of-sight ground fire against ground targets, and naval torpedoes.

A typical designator for guided missiles or rockets under the new system will consist of five digits:

- A letter indicating either the environment from which it is to be launched (if it is operational), such as underwater, from the air, etc., or if it is still in the experimental or test stage, a letter indicating its status.
- A letter denoting its mission, such as underwater attack, aerial interception, decoy, etc.
- A letter designating the type of vehicle — either a guided missile, rocket or a probe. Guided missiles



Recent successes of the Army's Nike Zeus antimissile missile prompted Miss Joy Proctor to show her confidence in a miniature version to send her Christmas list to Santa at the North Pole—at least the publicity boys at White Sands (N. Mex.) Missile Range, where she is employed as a clerk-typist, persuaded her to pose. That snowy-looking surface is sand.

are defined as vehicles capable of being controlled either remotely or from within. Rockets are vehicles whose flight path or trajectory cannot be changed after launch. A probe is an instrumented vehicle used to penetrate the aerospace environment and report back information (outer space probes are not covered under this definition.)

- A number of identifying different basic designs. For example, a Number 2 in a designator for an underwater-to-underwater guided missile would indicate the second design for that missile.
- A letter used to indicate major modifications to a basic design.

The Air Force has been given the responsibility of maintaining the designation system, assigning designators for all present and future rockets and missiles, and listing popular names for all vehicles.

The service developing a missile or rocket will name it after coordination with the other military services to avoid duplication.

## Battelle Institute Publishes Industrial R&D Planning Aid

The importance of making certain that each research and development project is compatible with an overall R&D plan to serve corporate objectives is stressed in a brochure titled "Widening the Horizons of Industrial Research and Development Planning."

Published by Battelle Memorial Institute, the statement is being offered to representatives of industrial management. It emphasizes the need for continual review and evaluation of corporate and business objectives and the overall R&D plan, since these are influenced by many changing factors.

One advantage of long-range planning, the brochure states, is that it encourages creativity among research people. When well briefed on corporate and business objectives and the overall R&D plan designed to meet these objectives, scientists are stimulated to greater effort, the document contends.

A feature of the brochure is a "Yes or No" check list of typical questions which can help management determine whether a specific research project is integrated with corporate objectives. Copies are available from: Publications Office, Battelle Memorial Institute, 505 King Ave., Columbus, O.

## Army Contracts Developing Of 6-Hp. Fuel Cell Engine

U.S. Army interest in fuel cells as advanced power sources explains a contract awarded in mid-December for the development of a silent six-horsepower engine.

The U.S. Army Mobility Command Engineer Research and Development Laboratories, Fort Belvoir, Va., let the \$359,190 contract to Thompson Ramo Wooldridge, Inc. Work is to be performed in Cleveland.

The silent engine requires only a source of hydrocarbon fuel to provide useful power. Under specifications it is to have the capability of operating for an hour on approximately 1-1/3 gallons of fuel, and is intended to drive high speed alternators for use in forward area activities. It is expected to be inaudible to the human ear at a distance of 100 feet under the quietest ambient conditions.

The developmental model will be chemically fueled and hermetically sealed. Engine components will include a mercury pre-heater, a radiant-heated boiler, a turbine suitable for driving a 24,000 r.p.m. alternator, a mercury pump, an air-cooled mercury condenser, a cooling fan, and necessary controls. It will weigh approximately 110 pounds.

An experimental unit is scheduled for delivery in December 1963.



NEW LOOK in U.S. Army's Nike Zeus antimissile missile, which consists of shorter, more blunt control surfaces replacing triangular fins near the nose, reportedly resulted in a considerable increase of Zeus performance in recent firings at White Sands Missile Range, N. Mex.

## USARO Officers Assigned To Hawaii, Turkey, Italy

Three officers of the U.S. Army Research Office (USARO), Arlington, Va., have been reassigned to posts that will take them respectively to Hawaii, Europe and the Near East.

Lt Col Paul Autrey, Chief, Operations Research Branch, Research Planning Division since May 1962, will join the ROTC Instructors Group, University of Hawaii, Honolulu.

During WW II he served in Italy and the Aleutian Islands as battery officer and commander. Recent assignments include service with the faculty of the Department of Nuclear Weapons of the Command and General Staff College and command of an Honest John rocket battalion, Third U.S. Missile Command, Fort Bragg, North Carolina.

LT COL CHARLES E. RAMSBURG, Acting Chief of the Scientific Information Branch, Research Support Division, will join the U.S. Army Element, Joint U.S. Military Mission for Aid to Turkey following training at Fort Bragg, N.C., and the Military Assistance Institute, Arlington, Va.

With ARO since 1958, he has served as a staff officer in the Foreign Research and Scientific Information Branches and as Acting Chief of the Research Support Division.

Previously he was a Technological Board Member, Instructor and Committee Chairman and Training Group Executive, Airborne-Air Mobility Department, U.S. Army Infantry School, Fort Benning, Ga.

Lt Col Ramsburg saw combat action with the 82nd Airborne Division in Europe during WW II and served with the 29th Infantry Regiment during the Korean War.

MAJ THOMAS H. TACKABERRY, Chief, Human Engineering Branch, Human Factors Division, will study Italian at the U.S. Army Language School, Presidio of Monterey, Calif., and then attend the Italian Army War College at Italy for a year. He has been selected for promotion to the rank of lieutenant colonel.

Assigned to the USARO staff since 1960, he holds a B.A. degree in humanities from Gonzaga University, Spokane, Wash., and an M.S. in psychology from Tulane University, New Orleans, La.

His combat record in Korea, where he served as a company commander and Assistant G-3 with the 2nd In-



Lt Col Paul Autrey Lt Col Charles E. Ramsburg Maj Thomas H. Tackaberry

fantry Division, is reflected by the decorations awarded him in 1952. These include the Distinguished Serv-

ice Cross, the Silver Star with Oak Leaf Cluster, the Bronze Star Medal and the Purple Heart.

## Danish Food Radiation Expert Aids Natick Program

Under a plan effected by the U.S. Army Research Office, Europe, Dr. Ari Brynjolfsson, a Danish internationally renowned nuclear research physicist, is working as a visiting scientist at the U.S. Army Radiation Laboratory.

Employed by the Danish Atomic Energy Commission since 1957, the 35-year-old native of Iceland served first as construction chief of Denmark's cobalt 60 irradiation facility and later supervised erection of a linear accelerator.

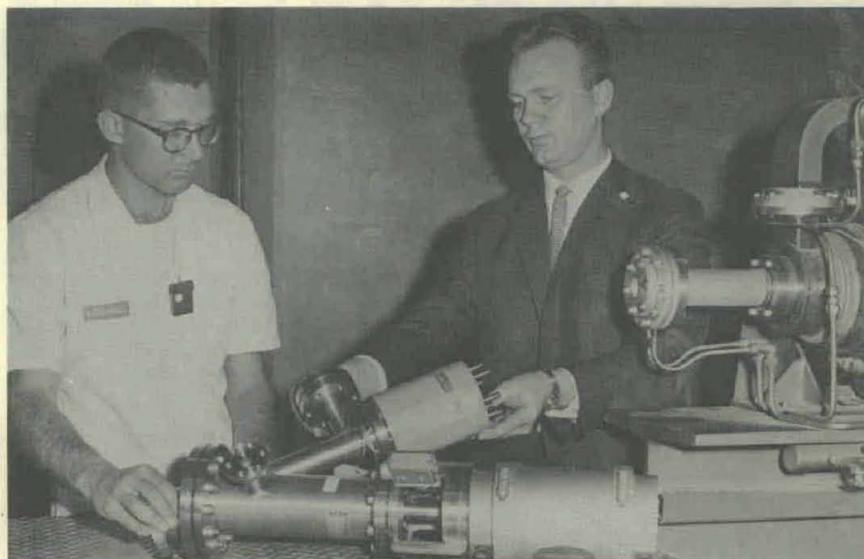
Until the U.S. Army Radiation Laboratory was dedicated recently at Natick, Mass., the Danish accelerator was described as the world's most powerful food research facility. (The 24-million electron volt, 18-kilowatt variable linear accelerator at Natick is described in the June 1962 issue of

this publication.)

Dr. Brynjolfsson has also served as chief of irradiation facilities and dosimetry research at Riso, Denmark. Since 1961, he has been chief of the flux measurements in reactors and radioactive source standardization.

A principal life-saving benefit derived from his work, he explained, has been the sterilization of plastic lung machines used in lung and heart surgery.

A graduate of the University of Copenhagen, Niels Bohr Institute, where he studied nuclear physics for six years, Dr. Brynjolfsson was a research scholar at the University of Iceland for a year. From 1955-57 he studied as an Alexander Von Humboldt scholar at the University of Göttingen, Germany, where he specialized in reactor physics.



DANISH PHYSICIST Dr. Ari Brynjolfsson (right) and U.S. Army physicist Pvt William Alexander examine a section of 24-million electron volt accelerator.

## DoD Establishes Intelligence School

The Defense Intelligence School (DIS), an advanced or post-graduate professional educational institution attached to the Defense Intelligence Agency (DIA), was established in November by DoD Directive No. 5105.25.

The school will conduct courses related to DoD intelligence functions designed to prepare selected military officer and key civilian personnel for important command, staff and policy-making positions in the national and international security structure. It will also prepare such personnel for duty in the military attache system and assist the career development of personnel assigned to intelligence functions.

The Director of the DIA, under direction of the Joint Chiefs of Staff, will operate and control the school. He will also determine the level and scope of courses of instruction to be offered, establish criteria for selection of students for resident courses, pro-

vide for correspondence courses, program, budget and the financial administration for the school.

From nominees submitted by the military departments, he will also select the Commandant, a general or flag officer of brigadier general or equivalent rank.

The directive establishing the school provides that the Commandant and Deputy Commandants will normally be from different military departments, while the staff and faculty will be selected on an approximately equal basis from the military departments and will include such civilian associates as required.

Elements of the DIS are operating as part of the U.S. Army Strategic Intelligence School, located in the Main Navy Building, and at the Naval Intelligence School, Anacostia Annex of the U.S. Naval Station, both in Wash., D.C. No site has yet been selected for the new school.

## Redstone Staffing Scientific Information Center

Hubert Murray, Jr., has been named Chief of Technical Research of the Redstone Scientific Information Center, Redstone Arsenal, Ala.

Murray's mission sounds simple — give the scientists of Redstone Arsenal all the information they need on any technical subject relating to missiles or space. He will be the vanguard of a new service offered by the Center which is a joint effort of the Army Missile Command and Marshall Space Flight Center.

To satisfy the appetites that Redstone's scientists have developed for information will be a complex job, requiring specialists in several technical fields. Four vacancies exist in the office now, and Murray feels the workload may be staggering before the vacancies can be filled.

Specialists are needed in physics, metallurgy, electronics, mathematics, and related engineering fields. They will be specialists in finding information, while the laboratory scientists specialize in applying this information to a missile system or space vehicle, thus cutting down the time needed for research.

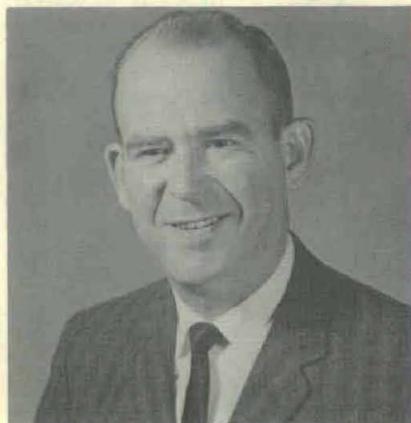
The research office will be used when a comprehensive report is needed on a particular subject. For simple reference questions, the scientists will still use the technical library.

To make information available on a "short notice" basis, the office will

be responsible for keeping up with the state-of-the-art in all the technical fields relating to the missile and space industry.

The Scientific Information Center serves all Army elements at Redstone Arsenal, Marshall Space Flight Center and all industrial concerns working on defense contracts.

Murray, who earned a B.S. degree in chemistry from East Tennessee University, has been at Redstone Arsenal since 1958. He was Chief of the Requirements and Dissemination Division, Directorate of Missile Intelligence, Army Missile Command, before assignment to the Scientific Information Center.



Hubert Murray, Jr.

## I&S Branch Seeks Officers Trained in Special Areas

Officers highly qualified in the intelligence and security field are in demand now for the Army's newest branch—Intelligence and Security.

Established on June 27, 1962, the branch is authorized approximately 5,000 officers, comprising the seventh largest of the 20 basic Army branches.

Needed most are specialists in the physical sciences, mathematics, general engineering, law, geopolitics, computer engineering, electronics, research and development and language and area specialization.

Until now, officers serving in intelligence and security assignments were distributed among the various Army branches. The new branch brings them together under a single career management authority.

It is anticipated that the branch will eliminate the need for separate Reserve intelligence and security branches. Reserve officers now assigned to the latter will be reassigned automatically to the new branch of the Reserves.

## Fouch Takes Dod Position For Equipment Maintenance

George E. Fouch has been appointed Deputy Assistant Secretary of Defense for Equipment Maintenance.

In this position, Mr. Fouch will establish Department of Defense policies and programs to assure the timely and economical maintenance of defense materiel. He will supervise efforts in the fields of quality control, value engineering and management practices in the industrial activities of the Department of Defense.

The need for greater attention to equipment maintenance and readiness has been brought about by the increasing size, complexity and cost of these functions. Payroll and supply costs of the DOD related to equipment maintenance are estimated at \$11 billion annually. Almost one million civilian and military personnel at some 2,000 locations are engaged in equipment maintenance activities.

Mr. Fouch brings to his new position a long record of experience in Government and private industry in industrial management. He has served as a senior consultant to the Logistics Management Institute, Manager of the Evendale Plant of General Electric Co., and consultant to the Department of the Navy.

## HEL Study in Swamp Fox II Probes Tank Confinement

By Samuel A. Hicks

Ability of men to withstand elevated tropical temperature humidity conditions induced by prolonged confinement in armored personnel carriers (APC) was studied recently in the Republic of Panama by the U.S. Army Human Engineering Laboratories.

Scientific personnel from the HEL supporting Research Laboratory, Aberdeen Proving Ground, Md., participated in Operation Swamp Fox II.

## U.S. Army Aids Korea on Human Factors Research

Possibilities for developing a cooperative human factors research program with the Korean Army are being studied by the U.S. Army.

Dr. E. Kenneth Karcher, Jr., Chief of the U.S. Army Research Office Psychology and Social Sciences Branch, Human Factors Research Division, and Jack Sternberg, U.S. Army Personnel Research Office, are assigned to the project.

Following a recent 5-week visit to Korean military installations, where they were briefed on each installation's mission and human factors problems, they reported interest among Korean military leaders.

Many of the Korean Army's human factors research problems, it was learned, are similar to those already investigated by U.S. human factors research personnel, including selection, classification, training, leadership and combat readiness.

The Korean Army is developing a personnel selection battery but needs technical personnel to pursue the program further. Use of the U.S. Army

As members of the Human Factors Engineering Team, Army R&D Scientific Group (ARDSG), they were attached to the Army Transportation Board Task Force Detachment No. 2.

Previous investigations in the general area of APC confinement conducted by the Human Engineering Laboratories have reported the results of periods of confinement of 4 to 24 hours in mobile and stationary vehicles. (HEL Technical Memorandum 3-60, 17-60, 1-61, 2-61, 23-61, 7-62, by S. A. Hicks). The purpose

Classification Battery was found to be inappropriate for the Koreans due to cultural, educational and manpower differences.

The exploratory trip identified critical areas of research which would not only lead to more efficient performance but would also effect extensive economic savings, according to the R&D team.

Consensus of the American visitors is that human factors research for foreign area operations must begin with a thorough knowledge of the area, its people and culture. Much of the research information obtained in Korea is applicable to other countries, particularly in Southeast Asia.

Karcher and Sternberg's trip prompted a return visit of two Korean Army psychologists, Lt Col Jong Hwan Kim and Maj Won Bong Kim, to the U.S. Army Personnel Research Office, Washington, D.C. The Koreans spent eight weeks with APRO scientists and showed special interest in the U.S. Army's Classification Battery, a major element in the aptitude system for enlisted men.

of these investigations was to identify the following:

- Decrements due to prolonged confinement in combat relevant performance as measured by a laboratory developed test program.

- Design deficiencies of current APCs that contribute to discomfort or any measured decrement during long term operations within the vehicle. (This program included measurements of marksmanship and response time, eye-arm coordination, equilibrium, and motor coordination and stamina.)

The investigation conducted as a part of Operation Swamp Fox II followed as closely as possible the procedures employed at Aberdeen Proving Ground. Because of the remoteness of the test area, extreme changes in measuring tools were necessitated without drastically changing previously established test criteria.

The tests selected for use in the field, thus were highly related to those used at APG. Where possible, the same measurements were taken, utilizing test courses or apparatus reduced in size and complexity, as dictated by portability requirements and terrain limitations. The final test battery measured equilibrium, stamina, hand-arm steadiness and choice reaction time.

In addition to these measurements, constant monitoring by an internal observer of the physiological changes of each inhabitant of the vehicle was accomplished throughout each test.

The results of this study, though at present still undergoing analysis, indicate the presence of a decrement in each of the performance criteria and physiological change highly related to change in ambient conditions and duration of confinement.

Dr. Arthur Woodward, Chief, Human Factors Engineering Team, ARDSG, Swamp Fox II, was assisted by Samuel Hicks (in charge of the psychological sub-team), Russell Randall, Bernard Corona, and Pfc Eugene Whitaker.



KOREAN ARMY psychologists, Lt Col Jong Hwan Kim (right center) and Maj Won Bong Kim confer with U.S. Army Personnel Research Office human factors chiefs Dr. William Helme (left), Senior Task Leader, New Classification Techniques Task, Military Selection Research Laboratory, and Mr. Edward Fuchs, Chief, Military Selection Research Laboratory.

## Armed Forces Cut Supply Items

The military services have agreed to eliminate 8,496 supply items managed by the Defense Supply Agency, increasing to 14,583 the item reduction decisions since the Agency began operations Jan. 1, 1962.

Most of the recent decisions involved three commodity areas: construction supplies 2,515; industrial supplies, 2,342; general supplies, 3,236.

## Army's BC-4 Camera System Photographs ANNA

The first operational test of the ANNA geodetic satellite's flashing light was photographed by a camera instrumentation system developed at the Ballistic Research Laboratories, Aberdeen Proving Ground, Md.

The photographs were taken at the Ballistic Research Laboratories station on Spesutie Island by a U.S. Coast and Geodetic Survey tracking team on the morning of Nov. 2.

Triggered manually by Johns Hopkins Applied Physics Laboratory personnel, the satellite flashes were observed with binoculars by the tracking team. Within minutes of this sequence, a second series of five flashes were triggered and photographed.

At the time the photographs were taken, the satellite was at azimuth 29° from N and elevation 50°. Immediately before and after the event, background skies were photographed enabling the scientists to determine the satellite's path with high accuracy.

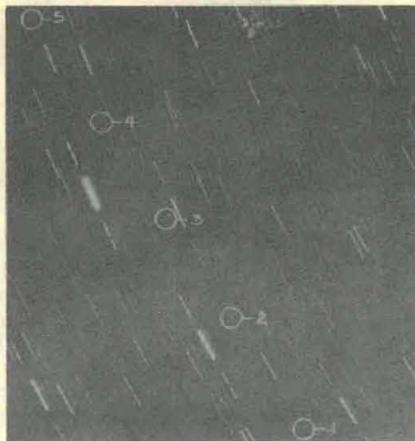
Of Swiss manufacture, the BC-4 camera photographing the flashes is one of the principal components of the instrumentation system developed by the Ballistic Research Laboratories. The flashing light of the satellite appears as small dots, two-thousandths of an inch in diameter, on the photographic plate. The camera is capable of photographing stars a hundred times fainter than the faintest visible to naked eye.

Project ANNA, tri-service administered by the Navy's Bureau of Weapons, provides from this and other satellite information, data useful in determining the size and shape of the earth.

The satellite moves in a nearly cir-



U.S. Coast and Geodetic Survey team members set up BC-4 camera used in tracking and photographing satellites. They are Lt Comdr Eugene A. Taylor (right), Lt (j.g.) Austin Yeager and Robert Price.



Flashing light of satellite ANNA shows up as a series of five dots (circled) on photograph taken by camera instrumentation system developed at Ballistics Research Labs.

cular orbit and circles the earth at a height of about 700 miles. Lasting only about one thousandths of a second, the flashing light on the satellite is operated every 5.6 seconds with a power output of a million watts.

The U.S. Coast and Geodetic Survey tracking team was commanded by Lt Comdr Eugene A. Taylor. Other members were Ens Richard B. Ballgren and Lt (j.g.) Austin Yeager of the U.S. Coast and Geodetic Survey, and Robert Price, Guy Fisher and Larry Schenkal, Civil Service employees.

## Dr. Sporn Succeeds Col Bunn on PDC Committee

Dr. Eugene M. Sporn is the newly appointed Army representative to the Prevention of Deterioration Center, Washington, D.C. Assigned to the Life Sciences Division, U.S. Army Research Office, Dr. Sporn succeeds Col Ralph Bunn of the same office.

A biochemist and toxicologist, he joined the Special Projects Branch of USARO in August. From 1958 to 1962 he served with the Chemical Corps R&D Command as Chief of the Research Division, and Chief of the Biological Division.

The Center operates with the support of the Armed Services under a contract between the National Academy of Sciences-National Research Council and the Office of Naval Research. The U.S. Army Research Office is the source of the Army share of funding.

## Services Review Program In Materials at Meeting

U.S. Army representatives participated in a tri-service meeting of the Navy Advisory Council on Materials, Nov. 26-27, at the Naval Research Laboratory, Washington, D.C.

Objective of the meeting was to review the FY 63 program in basic and applied research in materials and manufacturing technology in the Armed Services. Discussion covered programs funded at about \$100 million, and established a basis for continuous interchange of information on both in-house and contract research. Considered also was the possible use of facilities not currently in full use by the owner services.

The half-day program presented by Army scientists was moderated by Allan L. Tarr, Physical Sciences Division, U.S. Army Research Office, Arlington, Va.

Dr. Henry M. Davis, Director of the Metallurgy and Ceramics Division, Army Research Office-Durham, N.C., discussed basic research in the Army materials program.

Dr. Peter Kosting, Chief of the Materials Section, U.S. Army Materiel Command, headed a 6-man AMC group which outlined current and planned activities in applied research.

A similar program is planned for the fall of 1963, with the Army acting as host. Tentative site of the meeting is the Army Materials Research Agency, Watertown, Mass.

With an estimated annual loss of \$7 billion to the Armed Services due to deterioration, including "normal" wear, as a consideration, PDC officials are encouraging the military to make greater use of the Center.

As part of its activity in assembling and disseminating information and aiding coordination between the military, industry and independent organizations, PDC publishes "Environmental Effects on Materials and Equipment."

This periodical, containing substantive abstracts and extracts drawn from international publications on the title subject, is published monthly in two sections. Persons interested in receiving it may write to: Director, Prevention of Deterioration Center, National Academy of Sciences-National Research Council, 2101 Constitution Avenue, Washington 25, D.C.



Dr. George W. Howard

# Management Responsibilities For Army R&D Laboratories

By Dr. George W. Howard, Technical Director  
U.S. Army Engineer Research and Development Laboratories

Generally, the management role in any well-organized and well-staffed research and development enterprise is to:

- Provide a climate for work that will permit the maximum scientific or technical contributions by the worker. This means a constant weather eye must be kept on both the climate above and the climate below the supervisor's level, so that it is possible to anticipate many items and be prepared for the required actions.

- Provide the resources and general guidance to carry out the programs agreed upon and perform the necessary reviews to insure that the work is being pointed in the correct direction. (This will vary, of course, depending on exactly where the work falls in the R/D/E spectrum.)

- Protect the R&D worker from administrivia caused by requests for information to satisfy higher levels in the hierarchy. (This is to be carefully differentiated from the proper informing of a top echelon on matters concerning which it has every right to expect information.) This is no small order and the Research Supervisor has to approach his work with the precision of a tightrope walker.

Just who are we talking about in this title of Research Supervisor? Is it the Research Director of a large laboratory or is it the supervisor of a team of people working on the solution of a particular problem? Let's look at a vertical slice of the supervisors.

In any part of the laboratory organization the management must have skill that is largely composed of two fundamentals:

- Mastery of the technology of the enterprise.
- Knowledge of the principles of group behavior.

Management must have as thorough as possible a comprehension of all phases of operations which comprise its mission. This becomes increasingly difficult with each higher echelon of the management hierarchy. Consideration must be given to the fact that when a group of laboratories are pulled together into some form of an institution, the man who heads it cannot hope to have a thorough understanding of all phases of its activities.

No manager of a large institution can ever hope to become master of all the details of the technical operations under him in the age of specialization in which we live. Through his judgment in the selection of the next lower level manager or even the level below that, who will know about these details, will he be performing his role as a supervisor? These individuals in the next lower echelon will be able to provide the technical judgment needed. In larger enterprises, this may be even two management layers below the head of the organization.

The social principles upon which the behavior of groups of individuals are based depend to a large extent upon the size of organization. In a small laboratory, the ease with which personal contacts can be made, in a large measure, obviates the need for adopting organizational formalities essential in large organizations.

As one progresses from larger to larger groups within the scalar chain of the hierarchy, however, the opportunity for contacting individuals frequently becomes more remote. It is necessary that certain formal relationships be established in order to insure effective operation of the enter-

prise. These relationships are built into the organization.

The organization, then, becomes something which is used by management to accomplish its mission. It provides management with a means to exercise its authority in order, as R. E. Gillmore says, "to direct, coordinate and decide." It affects the enterprise in many ways, all of which are concerned with accomplishment of the mission. These include the individual, the workload, the resources, and all of those factors which tend toward the successful completion of a project.

Individual morale is affected by the clarity by which the structure establishes the duties and responsibilities of that individual. It also is used to prevent overlapping of effort in certain areas and to broaden efforts in others. Although the management might have broad technical competence, the technical capacity of a laboratory can be greatly hampered by improper organization.

The role of the supervisor in research and development establishments, then, is the same as for supervisors everywhere, generally speaking. It is the performing of those activities which are essential to good management. These, of course, are: planning, organizing, directing, coordinating, controlling and evaluating. The role of the Research Supervisor is to accomplish these functions in a manner that optimizes profits to the enterprise (in terms of usable work accomplished) with maximum output of scientists and technicians operating at their peak level of skill.

**PLANNING.** The supervisor, to accomplish his management role, has to resist the "fire fighting" pressures which are continually placed upon the lab and which will dissipate its productivity. By a solution of day-to-day problems, which are important solely because of their proximity, a balance must be obtained between the short- and long-term work of the organization.

Determinations in planning are the result of judgment. It has been well said that the highest function of the managerial mind is the exercise of judgment; judgment in planning, judgment in organizing, judgment in directing, judgment in controlling and judgment in evaluating. The management of an institution can be only as effective as its judgments are effective.

If the higher headquarters sees fit not to respect these judgments, then effectiveness of the management of the laboratories is reduced. If the management has justified the confidence of the higher echelons by its accomplishments, either in good developments for the military or for industry, its judgments should be honored.

Management that is continually justifying its actions to higher echelons, and finding that its judgments are continually subject to challenge, is greatly reduced in its usefulness. When management of a laboratory can no longer exercise judgment because of regulations which are imposed from on high, either in its own staff level or its corporate level, or from its customer, it then has lost a great deal of its worth.

Management's judgments can be ruined by legalistic interpretations. In any management operation, achievement is the criterion of success. When administrative procedures become paramount, the entire value of the system is changed and success is subordinated to procedural

accuracy. This happens time and time again, and when it does it becomes the role of the entire research supervisory staff to fight continually to see that the procedural activity does not bury ability to accomplish the mission.

The overriding requirement for living within regulations may produce an irresistible urge to maintain a fully documented and legalistic record of every transaction to establish beyond a doubt that each action is within the regulations. When this happens, the supervisory staff of the laboratories must resist, in every possible way, the pressure for proceduralism. This does not mean that there should be a careless, slipshod administration with its head in the clouds and its tail in a crack. Rather, it means that there should be a business-like administration that does everything possible, within reason, to permit its professional personnel to do the job for which they were employed. The management role of the supervisor here must be one of protection of the producing worker from the harassment of the operation which can be performed by personnel with less technical qualifications.

**ORGANIZING.** The Research Supervisor must maintain a staff with high technical ability which is carefully integrated. The success of the enterprise depends entirely upon its ability to attract and hold personnel of high caliber. The directing of the work must, of necessity, usually be conducted in such a manner as to insure that individuals "keep their eyes on the ball" so that the laboratories' requirements for the solution of problems are met. Here is an arrangement that quite frequently causes much strain and heartburn.

The conflict of the professional persons with the administrators in a bureaucracy is a continuing one. They have to learn to live together for success of the enterprise, but the learning process leaves deep scars. Rourke covers this condition well in his article, "Bureaucracy in Conflict: Administrators and Professionals" (ETHICS, Vol LXX, No. 3, April 1960). He states:

"While in theory these roles are complementary, organizational life is in fact marked by pervasive and sometimes bitter disagreements between the two camps. True enough, it is a conflict that is often masked behind the united front which institutions ordinarily present to their environment.

"This appearance of unity is partly due to the fact that bureaucratic organizations, like all social systems, find it possible to close ranks against the outsider. But it is reinforced by the consideration that each of the parties involved has a vested interest in maintaining an alliance with the other. For it is an exceptional circumstance where either administrative or professional talent can find a complete outlet in modern society outside of bureaucratic employment altogether, and organizations depend for their operation upon each of these skills.

"True, administrators and professionals remain inextricably linked to each other in organizational life. But the system of antagonistic cooperation in which they are joined reflects a deep split in the occupational ranks of modern society."

Too frequently in the modern research and development establishment, it is the rule rather than the exception that a professional person must prostitute himself to administrative duties to receive further advancement in salary.

The U.S. Army Engineer Research and Development Laboratories at Fort Belvoir have tried to alleviate the difficulties of this situation by what we call our Dual Ladder Promotional System. Here we have taken a leaf from the NIH and Bureau of Standards operational procedure and embellished it with sufficient red tape to give it a good flavor to the civilian personnel people. At the time a man becomes a GS-12 he makes up his mind whether he prefers the administrative to the technical ladder.

When he is due for his next promotion, he is considered either for a Section Chief job or for a Principal Engineer or Scientist. There are jobs which are of sufficient latitude that the position can be classified at different grades because of the type of work.

Here we are able to consider what specialties the man brings to the job, his accomplishments and his standing in the scientific community and not just the number of people he supervises. The Section Chief is in the Administrative Chain, which goes to Branch Chief, Department Chief, and Technical Director. The technical ladder, on the other hand, goes from Principal Engineer or Scientists to Head Engineer or Scientist, Chief Engineer or Scientist, and finally to Consultant.

Selections are made by a committee on the recommendation of the Department Chief. I am chairman of the committee, which is composed of the Director of Research and two members from outside ERDL, who are prominent in the nominee's field. The Civilian Personnel Officer sits on the committee, as secretary without vote.

This procedure has been worthwhile. Many other industrial and governmental labs use it without formalizing it to the extent we have. The question is frequently raised, "Why bring in outsiders?" Actually, this can be argued either way, but is a prestige factor that we have tried to add to the program because it is fairly new and the consultants from outside help us by their stature.

**DIRECTING.** It has been said that the Research Director does not direct, but rather that he protects the scientists from management above that wishes to direct them. In the research portion of the R&D spectrum, this is a fairly true statement, but as we approach the final development of a piece of hardware, it is possible to direct. However, if management has done its job in providing the capable staff that it should, the job of direction is minimized.

Unlike the man in industry, doing business with the Government on a cost-plus-fixed-fee basis the director of a Government laboratory in the Armed Services is working with an authorized amount of money toward a fairly positive goal. This is similar to the industrial laboratory director working for his own laboratory. The Cost-Plus-Fixed-Fee method of doing business is good for industry and at times is good for the Government. In fact, it is frequently the only way a contract can be written.

However, the abuse of CPFF contractual procedures by industry being like the camel—merely getting its nose under the tent in the initial CPFF bid, with the rest of its body getting there ultimately—has caused more difficulty in directing R&D contracts, than any other single factor, to my knowledge. The trend toward fixed-price contracts is going to be good for industry as well as for Government. The management role in the research portion of the spectrum is one of protection. As we progress further across the spectrum the role can change to one of devil's advocate, always constructively, however, and not with a negative attitude.

**COORDINATING.** The role of the supervisor in coordination is no different than that in any management operation. It probably should be added, however, that there is no better "rumor mill" than an R&D organization. It is important to spike rumors early with as much of the truth as you can give, but sometime it is not possible to go all the way. This is very ticklish ground because the integrity of management must be like Caesar's wife. If this is not the case and the people begin to doubt the integrity of their supervisors, much effectiveness is lost, to put it mildly.

Once again it becomes a question of judgment as to  
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## Technical Director Discusses Management Responsibilities in Laboratories

(Continued from page 29)

how the supervisor is going to act on this kind of problem. This is not something you learn from a book or from hearing people talk about it. The supervisor must evaluate the entire problem and decide what to say. I, personally, favor as much as can possibly be told as quickly as possible, and I am sure this view is shared by most. However, the element of judgment comes into this problem in a very important fashion, at times, and some supervisors play their cards close to their chests.

**CONTROLLING.** This is an area that has been in ill repute since the comptroller has come into being. However, it is essential that controls be exercised for the proper administration of any program; and it is much easier to control the work as it progresses from the basic end of the spectrum toward the product end. The closer we come to the end product, the more realistic can the controlling become. We use Program Review at ERDL in addition to the Monthly Operation Statement with which I am sure you are familiar.

Controls should not stifle. Here again, I might warn of the tendency in bureaucracy for the topside to require control reports which are never really adequate for what is desired, always take away time of the working personnel, cost dollars to reproduce, and frustrate the people concerned with the work to a very large degree.

The best kind of control is that which provides the essential information for those who have a need to know. Thomas Jefferson's practical principle of "the least government is the best government" is certainly good for research and development in its earlier stages. I have just spoken critically of control coming from above. It is also a very definite fact that the supervisory echelons of every laboratory should realize that its own administrative actions can be fully as arduous to the people who supply the information.

The fact that the requirement for information is laid on a man is all that bothers him. He doesn't care whether this requirement comes from within the laboratory or at the staff level above his laboratory. It is essential, therefore, that the supervisory echelons of the laboratory criticize their own administrative actions just as completely and carefully as they criticize actions imposed from above.

**EVALUATING.** Although the evaluating role of the research supervisor is considered part of the process of directing, I want to consider it separately. This is because a joint developer-user evaluation can serve a very useful purpose, at times. As stated earlier, accomplishment of the mission is the criterion of success.

Periodical evaluations must be made in order that one may see that he is on the road to success. Not only does

the evaluation help bring to the attention of the responsible personnel the status of the work with which they must be completely familiar; it also provides a morale booster to those engaged in the work.

A premise here, however, is that the evaluation should not be made so frequently that it becomes a burden on personnel. It is not easy to make a thorough evaluation of a program in a short time, yet this should be a prime objective. Brevity reduces the loss of time from productive work, permitting mere people to attend the evaluation.

**CONCLUSION.** What I have said certainly does not cover the whole field. I have simply stated some of the thoughts that are nearest and dearest to me. They represent what I feel are some of the basic principles to which the supervisory personnel of any laboratory must subscribe for the successful operation of an R&D enterprise.

Before closing, however, there is one other area that I need to mention because it is the most important, most essential and sometimes most difficult task of the Research Supervisor. It concerns the people who make the laboratories. We can have the most wonderful supervision, plans, budget and facilities, but without technically qualified people, properly motivated, we have nothing. You can take properly qualified personnel and put them in a wilderness without anything, and I assure you they will change this condition.

Our greatest single resource in any research and development establishment is people. Our human resources are our greatest asset. The problem concerning our human resources should be tackled with imagination and vigor. Typical of these is the salary problem.

Now graduates are being hired at increasingly higher salaries, with the result that they are starting out almost equal to the people who finished two to three years ahead of them. This sharp increase in starting salaries also makes a problem of the people who finished their studies 10 to 15 years ago, since their salaries have not had a similar percentage increase.

It is absolutely necessary that some of the best brains of our youth be channeled into research and development, both in the technical and management areas. Only through the challenge of work can we give our better graduates real reasons to be in Army R&D. Because they are not sufficiently challenged by their work, salary becomes their most important reward and they become job jumpers.

An important part of the Research Supervisor's role is to nurture our young scientists and engineers. This is a responsibility not only to the enterprise but also to the country. How well we progress and utilize our resources in the next 10 to 15 years is going to decide the future of this country for posterity.

## Dr. Howard Earns Citation as Commanding Officer of Detachment No. 39

An outstanding leader of the U.S. Army Reserve Research and Development Unit Program, Col George W. Howard, was honored recently for his service as a long-time Commanding Officer of Mobilization Designation Detachment No. 39.

Technical Director of the U.S. Army Mobility Command Engineer Research and Development Laboratories, Fort Belvoir, Va., Dr. Howard was cited by Col J. H. Kerkerling, Commanding Officer, upon the occasion of his transfer to the U.S. Army Retired Reserve. He was presented a certificate and scroll signed by Maj Gen Stanley R. Larsen, XXI U.S. Army Corps Commander.

Appointed Technical Director in 1956, Dr. Howard was the first employee of the Laboratories to hold a supergrade Public Law 313 position. He began his Government career with the U.S. Army Corps of Engineers at the U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Miss., in 1932.

In 1941 Dr. Howard transferred to the Fort Belvoir Engineer R&D Laboratories and in 1953 was the recipient of a Rockefeller Public Service Award, which is made to outstanding careerists in the Federal Government.

That award financed a year of study for Dr. Howard during which

he authored a book on research and development. He also has authored a number of technical papers and articles for presentation at seminars and for publication in recognized professional journals.

A native of Vicksburg, Miss., he attended Mississippi State, earning a B.S. degree in 1932 and a civil engineering degree in 1938. In 1941 he was awarded a master's degree from George Washington University and in 1955 earned his doctorate at the Technical University in Graz, Austria.

He is a member of the American Association for the Advancement of Science, the American Society of Civil Engineers, the Society of American Military Engineers, the Society for Advancement of Management, the Washington Academy of Sciences, and Tau Bet Pi. He also is listed in "Who Knows and What" and "Who's Who in Engineering."

# Armed Forces Institute of Pathology Marks Centennial

The Armed Forces Institute of Pathology, internationally recognized for service to mankind, recently celebrated its 100th anniversary.

Some 250 scientists from the United States and abroad met at AFIP Headquarters in Washington to hear eminent specialists discourse on important medical problems that will face the world for the next 100 years.

Approximately 800 persons witnessed the AFIP dedicate its Centennial Medical Museum Exhibit, emphasizing contributions made to medical science in and after the Civil War.

AFIP Director Col Frank W. Townsend, U.S. Air Force Medical Corps, welcomed the conferees on behalf of the Institute.

Secretary of the Army Cyrus R. Vance, who was unable to deliver his scheduled keynote address in person, sent a message via Lt Gen Leonard D. Heaton, The Army Surgeon General. Mr. Vance described the AFIP as "a potent and unique force" in making the United States regarded as the leader of medicine in the world.

Presently a joint Armed Forces endeavor, the Armed Forces Institute of Pathology began as the Army Medical Museum in May 1862, and for 87 years was under Army leadership. More currently it has had the integrated leadership of the three Services, the Veterans Administration, the National Academy of Sciences, and the Public Health Service.

From its modest beginning of three specimens located on a shelf above the desk of its first curator, the Institute has expanded continuously. Today it has over a million specimens and employs a staff of some 600 people who are engaged in over 200 separate pathological projects in consultation, education and research.

Acclaimed as much more than a pathological center devoted to American fighting men and women, the AFIP, in the words of Secretary Vance is "perhaps the most advanced institute of pathology in the world."

Presently, 31 physicians from 27 foreign countries, including Europe, Africa, Asia, and South America are studying at the Institute. Hundreds of internationally respected physicians from all continents visit the Institute each year.

The Institute ships pathological slides, photographs, booklets and case histories to any physician in the world at the university where he teaches, at the institute where he does

his research, or in the office where he practices.

The AFIP entered the nuclear age with its study of the first atomic casualties of Hiroshima and Nagasaki, and continues to work with the Japanese Government in this field. More recently the National Aeronautics and Space Administration called on the Institute to assist with Project MERCURY and to study effects of cosmic radiation of the brain.

Speakers at the Centennial Scientific sessions and their presentations follow:

Esmond R. Long, M.D., Professor of Pathology, Emeritus, Henry Phipps Institute, University of Pennsylvania—*The Army Medical Museum*.

Hugh Grady, M.D., Professor of Pathology, Seton Hall College of Medicine and Dentistry, Jersey City, N.J.—*The Army Institute of Pathology and the Armed Forces Institute of Pathology*.

Saul Jarcho, M.D., Associate Physician, Mount Sinai Hospital, N.Y.—*The Influence of the Armed Forces Institute of Pathology on Medicine*.

Col Colin F. Vorder Bruegge, MC, USA, Deputy Commander of the Medical Research and Development Command, Office of The Surgeon General, U.S. Army—*New Environments and Their Problems*.

Hans Smetana, M.D., Chief of the Pediatric and Hepatic Pathology Branch, Armed Forces Institute of Pathology — *Yellow Fever — Sixty Years Later*.

Col F. D. Maurer, VC, USA, Director, Pathology Division, U.S. Army Medical Research Laboratory, Fort Knox, Ky. — *Emerging Animal Diseases*.

Arnold R. Rich, M.D., Professor of Pathology, Emeritus, Johns Hopkins University School of Medicine, Baltimore—*Immunologic Disease*.

Col Helmuth Sprinz, MC, USA, Chief, Department of Experimental Pathology, Walter Reed Army Institute of Research—*Health and Disease in a Germ-Free Environment*.

Capt G. J. Duffner, MC, USN, Director of the Submarine Medicine Division, Bureau of Medicine and Surgery, Department of the Navy—*The Underseas Environment*.

Col Carl Tessmer, MC, USA, of the Medical Research and Development Command, Office of The Surgeon

General, U.S. Army—*The Effect of Electromagnetic Radiation on Tissue*.

Col Frank M. Townsend, USAF, MC, Director of AFIP—*The Study of Problems Arising from High Speed Transportation*.

Webb E. Haymaker, M.D., Assistant Director, Ames Research Center, National Aeronautics and Space Administration, Moffet Field, Calif. — *The Space Environment*.

Col Robert H. Holmes, MC, USA, Surgeon, Defense Atomic Support Agency—*Weapons and Wounds*.

Paul E. Boyle, DDS, Dean and Professor of Dental Medicine and Oral Pathology, Western Reserve Schools of Dentistry and Medicine, Cleveland — *Periodontal Diseases*.

Richard H. Follis, Jr., M.D., Chief of the Nutritional Pathology Branch of AFIP—*The Ecology of Hunger*.

William S. Middleton, M.D., Professor of Medicine, Emeritus, University of Wisconsin School of Medicine and Chief Medical Director, Veterans Administration—*Increased Longevity and its Consequences*.

Harold L. Stewart, M.D., Chief of the Laboratory of Pathology, National Cancer Institute, National Institutes of Health, Bethesda, Md.—*Uncontrolled Growth of Cell Populations*.

William C. Manion, M.D., Chief, Cardiovascular Pathology Branch, AFIP—*Aging Circulation*.

John J. Christian, Sc.D., Associate Director, Penrose Research Laboratory, Philadelphia Zoological Society, and Associate Professor of Pathology, University of Pennsylvania, Philadelphia — *The Pathology of Overpopulation*.

Chairmen for the scientific sessions were:

Brig Gen George R. Callender, USA (Ret.), former Director of Pathology and Allied Sciences Division, Veterans Administration and Former Director of AFIP.

William H. Feldman, DVM, D.Sc., Professor of Pathology, Emeritus, Graduate School of Medicine, University of Minnesota, and Chief, Laboratory on Research on Pulmonary Disease, U.S. Veterans Administration.

Shields Warren, M.D., Professor of Pathology, Harvard Medical School, Boston.

Robert A. Moore, M.D., President of the Downstate Medical Center, State University of New York, Brooklyn.



Christmas came early for 21 employees of the U.S. Army Mobility Command's Engineer Research and Development Laboratories, Fort Belvoir, Va., in the form of certificates and cash awards aggregating \$1,900 for achievements.

Col Philip G. Krueger, Deputy Commander, presented certificates marking their promotion to higher Civil Service grades to Robert R. Boyer, Frank J. Shields, Albert Zupan and Robert C. McMillan.

Charles L. (Buddy) Deane was presented \$100 and Glendon T. Skidmore \$150 as winners of both Outstanding and Sustained Superior Performance awards.

Outstanding rating certificates were presented to Manfred Gale and Paul L. Whims.

Sustained Superior Performance award recipients included Mrs. Ethel G. Davis, \$200; Mrs. Hazel Glover, \$150; Edward K. Collins, \$200; Amos J. Coleman, \$150; Leonard E. Simpson and Leo R. Croisetier, \$150 each; and William H. Gordon, \$200.

Initial cash awards for invention disclosures were made to T. B. Edwards, Dr. Clyde C. Barnhart and Ralph E. Hopkins. Edwards received \$150 in connection with three inventions concerning "inflatable wheel pontoons," "field reversing switch for series motors," and "vehicle wheel suspension." Barnhart received \$50 for a "proximity surface still," a distillation device for purifying sea water. Hopkins received \$50 for his invention concerning "voltage control of permanent magnet generators." All three will receive additional awards when patents are granted.

Richard P. Bliss, Dr. George Hass and Dr. J. Thomas Cox received Special Act and Service awards for authoring published articles. Bliss received \$100 for his article, "Photography—The Hard Way." Hass and Cox each received \$50 for coauthoring an article entitled "Triple Layer Anti-reflection Coatings on Glass for the Visible and Near Infrared."

**OTHER HONORS and AWARDS** recently accorded civilian employees of the U.S. Army include:

Gendron J. Legris, food technologist, Armed Forces Food and Container Institute, Chicago, Ill., Meritorious Civilian Service award for "outstanding accomplishment in designing and developing semi-sold food-in-a-tube items which were successfully used during the Project Mercury flight in space."

At White Sands Missile Range, N. Mex., more than 50 employees received certificates and monetary awards totaling more than \$6,000 under the Army's Incentive Awards Program. Leading awards included:

Paul Milnarich, Jr., \$250 for work on an intensive theoretical investigation of atmospheric degradation of tracking system performance.

Colman M. Polvado, \$200, and a citation for Special Act or Service. James D. Perdue, \$100 for patenting an improved process for displaying digital data in a graphical format.

**ADDITIONAL RECENT AWARDS** presented at the U.S. Army Engineer Research and Development Laboratories included:

Adolph H. Humphreys, Special Act and Service award for \$300 for designing and executing a unique experiment for the precise evaluation of camouflage protection provided the individual soldier by various combat uniforms.

Karl H. Steinbach, \$250 Sustained Superior Performance award, for his theoretical and experimental work in electromagnetics.

Hyman Graus, \$250 Sustained Superior Performance award, for work with the Labs' missile support equipment program.

### **AMAC Holds Final Meeting, Phases Out in Reorganization**

The Army Materials Advisory Committee (AMAC) conducted its final meeting on Dec. 18-19 at headquarters of the U.S. Army Materiel Command (AMC), Washington, D.C.

In accordance with the overall reorganization of the Army, AMAC is phasing out at this time. It is anticipated that the committee's responsibilities will be assumed by various technical groups in the U.S. Army Materiel Command.

AMAC was established in June 1961 to advise the Chief of Research and Development on the Army materials program, succeeding the Army Scientific Advisory Committee-Materials. Composed originally of representatives from the seven Technical Services and materials research experts from other Army agencies, AMAC also acted as adviser to the Army representation on the Materials Advisory Board (MAB) panels and committees.

Among featured speakers will be Dr. Robert Young, Stanford Research Institute; Col Myron T. Johnston, Plans Division, OCRD; Dr. Wilbur M. Michs, the Rand Corp.; Dr. Peter Kosting, Chief, Materials Branch, AMC; and Dr. James Martin, Director, Army Materials Research Agency.

## **SCIENTIFIC CALENDAR**

Medical Conference, Dakar, Senegal, Jan. 5-12.

Conference on Ultra-High Energy Nuclear Physics, Bristol, England, Jan. 7-8.

Conference on Relations Between the Structure and Mechanical Properties of Metals, Middlesex, England, Jan. 7-9.

Winter Meeting of the National Society of Professional Engineers, San Antonio, Tex., Jan. 9-12.

Meeting of the American Chemical Society, Cincinnati, Ohio, Jan. 13-18.

International Conference on Radiation Research, sponsored by U.S.A. Natick Labs and NAS, Natick, Mass., Jan. 14-16.

International Symposium on Immunopathology, La Jolla, Calif., Jan. 15-19.

Conference on Engineers' Training, Strasbourg, France, Jan. 17-19.

International Conference on Chemistry and Biochemistry of Seed Proteins, New Orleans, La., Jan. 21-23.

Annual Conference of the Institute of the Aerospace Sciences, N.Y.C., Jan. 21-23.

9th National Symposium on Reliability & Quality Control, sponsored by the American Society for Quality Control, IRE and AIEE, San Francisco, Jan. 21-24.

Annual Conference of the American Meteorological Society, N.Y.C., Jan. 21-24.

International Symposium on Advances in Gas Chromatography, Houston, Tex., Jan. 21-24.

Annual Meeting of American Mathematical Society, Berkeley, Calif., Jan. 24-27.

Annual Meeting of the Mathematical Association of America, Berkeley, Calif., Jan. 26-28.

Winter Meeting of the American Institute of Electrical Engineers, N.Y.C., Jan. 27-Feb. 1.

4th Winter Convention of Military Electronics, sponsored by IRE, Los Angeles, Jan. 30-Feb. 1.

College-Industry Conference of American Society for Engineering Education, Atlanta, Ga., Jan. 31-Feb. 1.

3rd International Symposium on Quantum Electronics, Paris, France, Feb. 11-15.

### **Materiel Command Places 3 Systems Under Managers**

Three additional Army weapons and equipment systems have been placed under project management and one weapon system removed from the U.S. Army Materiel Command list of project managed items.

Each of the 32 project managers appointed by and reporting directly to Lt Gen Frank S. Besson, Jr., Commanding General of the U.S. Army Materiel Command, is assigned complete responsibility for the research, development, production and delivery of his assigned weapons system.

The new systems and project managers are: Special Warfare, Col Robert R. Lutz; Army Area Communications System, Col Charles P. Reeves; Automatic Chemical-Biological Warning System, Lt Col Joseph A. Heitt.

Dropped from the project management list is FABMDS (Field Army Ballistic Missile Defense System), now under normal staff supervision.

# Newsmagazine Lists Highlight Articles Published in Past Year

Numerous readers have suggested that publication of a semiannual index of some of the more significant articles carried in the *Army Research and Development Newsmagazine* would be helpful. In December 1961 page 23 listed the more important stories under the month in which they appeared. The following list covers major articles published during the preceding 12 months.

## DECEMBER 1961

— Authors selected for 96 Army Science Conference papers.

Brochure, film outline application of Value Analysis techniques to effect substantial cost cutting in research and development of military armaments and materiel.

Department of Defense directive prescribes basic research policies.

Developmental test firings of the Mauler air defense guided missile are being conducted by the Department of the Army.

Results of an extensive study by the Army Ad Hoc Committee for Materiel Testing are scheduled for submission to the Chief of Staff by Jan 15, 1962.

Human Factors Research Branch transferred to OCRD from TAG Personnel Research Office (APRO).

An 800-page unclassified volume entitled *Encyclopedia of Explosives and Related Items*, has been published by the U.S. Army Picatinny Arsenal.

Improved techniques in battlefield emergency treatment of severely wounded soldiers are promised by results of investigations of familiar drugs by U.S. Army medical officers.

Contract awarded for mobile assault bridge. Director of Defense Supply Agency authorized to operate and control supply and service organizations, activities and facilities assigned to the Agency.

Three Military Services support study on environment sensing.

Understanding patents can be a powerful tool for research workers, scientists and engineers. (Part 1 of 3 parts).

The U.S. Army Logistics Management Center at Fort Lee, Va., develops resident course in Research and Development Project Administration.

Facts on the geographic distribution of U.S. scientists are contained in a preliminary report *Scientific Manpower Bulletin No. 15* published recently by the National Science Foundation.

Tests to determine the performance of an Army warhead section transporter system during rail impacts demonstrated capability of the transporter in reducing the level of shock.

An electronic device that counts and measures the size of raindrops has been developed by the Research Division of New York University's College of Engineering.

Strengthening of Free World defenses through integrated research and development effort, is demonstrating the soundness of the Mutual Weapons Development Program.

Radiation effects associated with a nuclear bomb explosion are being simulated and studied at the U.S. Army's new "pulse" reactor at DORF—for Diamond Ordnance Radiation Facility.

## JANUARY 1962

—ASA (R&D) reviews problems in major policy addresses.

The Army Ordnance Missile Command at Redstone Arsenal, Huntsville, Ala., reorganizes to achieve management economies and effect maximum utilization of personnel.

Well pumps chemical waste two miles into earth.

Experimental 85-pound portable X-ray scheduled for field testing.

WRAIR initiates series of medical seminars on advances in medical science.

*Nike Zeus scores impressive test firing successes.*

*ARPA funds contributing to fuel cell research.*

*Chemical Corps, Health, Education and Welfare Department studying prevention of contamination of commercial food and drugs from enemy biological agents.*

*United States, Canada cooperating to develop Mauler system.*

*Statistics point up Government problem of retaining top quality scientists and engineers.*

*Army conducting studies of permacrete as an approach to the problem of construction in remote parts of the Arctic.*

*Army begins cold tests of Pershing missile system.*

*Army Research Office official seeks to broaden understanding of ASPR XV.*

*Worldwide synchronization of atomic clocks in a feasibility project termed Project WO-SAC reported complete.*

*Department of Defense contract with Logistics Management Institute aims at better business management practices.*

*Completely "blind" landing system enables helicopters to fly to any area of a battlefield and land without the "talk-down" assistance of a ground operator.*

*Titanium plates utilized in improved armor vest.*

*New Ordnance Corps materiel since 1952 reflects speed-up of science.*

*Ultrasonic sounding techniques used for materiel inspection.*

*Helicopter seen as aid in target range triangulation.*

*Patents knowledge viewed as useful tool for R&D personnel. (Part 2 of 3 parts).*

*Press gives top play to Mrs. Frances Whedon, only woman among 100 rocketry experts.*

*Gradual phase-out of the Nike Ajax missile and arming of National Guard defense missile units with the much more powerful Nike Hercules is planned for late 1962.*

## FEBRUARY

—Army reorganization effects sweeping changes in R&D.

Implementation of Army reorganization assigned to plans group.

Civil Service Commission raises scientists, engineer entrance pay.

Engineer Research and Development Laboratories testing compact air conditioner employing thermoelectric principles instead of refrigerant gases.

OCRD manpower surveys seek improved utilization of resources involving over \$200 million payroll.

TRECOM plans helicopter crash tests to study safety.

Society of Automotive Engineers considers analysis of gas turbine program.

Switched Circuit Automatic Network — (SCAN) hailed as a breakthrough in military communications.

Automated flight control device relieving helicopter pilots of the need of operating five controls in flight.

President's Federal pay panel recommends reform.

U.S. Army Materiel Development and Logistic Command organization chart.

U.S. Army Combat Developments Command organization chart.

QM research seeks improved personnel armor materials.

Patents knowledge viewed as useful tool for R&D personnel. (Part 3 of 3 parts).

USASRDL develops electro-optical space tracker, termed as "rugged as an artillery piece and accurate as an astronomer's telescope."

Army Language School offers scientific Russian courses.

Army Ordnance Corps gains by study of foreign weapons developments.

Polar expert suggests closer scientific ties needed with Australia, New Zealand, India.

Utilization of the provisions of Section XV of the Armed Services Procurement Regulation explained for benefit of contractors.

Project ADVENT advances with installation of antenna stations.

## MARCH

—Five generals head Army reorganization implementation groups.

WRAIR opens Institute for Dental Research.

19-point program proposed to improve ASTIA service.

A weather radar on wheels designed to track storms as far as 400 miles away for combat troops has been developed.

SC develops Laser with high power beam.

Scientists are shooting radio signals through a flashing tube of gaseous matter called plasma in studies of its radio characteristics.

Battle sketches and pictures can be flashed by radio directly from frontlines to command headquarters by an experimental device.

Universal Engineer Tractor moves into serviceability testing phase.

Fabrication and installation of the first hydropneumatic suspension system for combat and tactical vehicles has been completed.

A pump unit incorporating a simple, highly efficient controller has been developed.

A hydrosark forming method that literally hammers metal into shape under water with one giant blow has been designed.

Chemical Corps aerobiology research geared to public health.

(Continued on page 34)

## HEL Requests Prove Newsmagazine Is Widely Read

In the August 1962 issue of the *Army R&D Newsmagazine*, the U.S. Army Human Engineering Laboratories, Aberdeen Proving Ground, Md., announced the findings of two research tasks. One article reported some of the results of a study conducted by the HEL at the Hunter-Liggett Military Reservation, Calif., a field agency of the Combat Development Command, on helicopters as an assault weapon. The second article reported an HEL publication of a Human Factors Guide for the Design of Military Vehicles.

Since these two articles appeared, the HEL report that they have been besieged by requests for copies of the two technical reports. Requests have come from all areas of the United States and many foreign countries.

Since original distribution of both reports had been rather extensive, the large number of requests surprised HEL psychologists. At the last count, approximately 175 requests had been received for the helicopter report and 400 for the Human Factors Guide.

HEL officials commented that there seems to be no doubt that the *Army R&D Newsmagazine* is widely read and offers a good medium for the exchange of technical information.

## News magazine Lists Highlight Articles for 1962

### MARCH (Continued from page 33)

A radio-sounding technique to plumb polar ice has been successfully used to measure the depth of a massive glacier.

Radio sounding tests may explain polar aircraft crashes.

Discrimination radars set up for Nike Zeus missile system.

ABC Standardization Program unites three armies.

National Science Foundation credits Army with major assist on Antarctic map project.

Defense Control Center opened.

Defense Logistics Service Center established.

Ordnance brochure offers technical plan for beryllium R&D.

Forty-eight aircraft rockets mounted on a turbine-powered helicopter are undergoing an extensive series of test firings.

ADVENT antenna installed at Camp Roberts.

Army Engineers try living in Greenland tunnel using "buildings in barrels" plastic foam shelter.

Chemical Corps weapons development rising to technology tempo challenge.

Defense Supply Agency establishes Electronics Center.

Gas turbine overland train undergoing tests to increase mobility in undeveloped regions.

10-year test proves acetate shield durability.

### APRIL

—Army invites 500 leaders to biennial science conference.

Army gets approval to create Limited War Laboratory.

Views on role of in-house laboratories outlined in address to American Management Association.

APG Ballistic Research Labs design, build advanced computer.

Adhesions following surgery for tendon repair are necessary for the healing process, an Army scientist has declared.

Materials experts study space probe thermal protection.

Army-wide letter stresses opportunities in Secretary of Army Fellowships Study.

CmlC scientist cites general need of safety in microbiological labs.

Signal Corps testing 10-pound "flashlight radar."

Defense Department announces ASPR revision to provide contractor incentives, penalties.

Chief of Research and Development urges widespread use of SAE consultative aid.

Simple methods developed of decontaminating water from known chemical agents which might be used by the enemy on troops in the field.

Eminent surgeons acclaim Army's new heart pump after tests; live animal experiments indicate capabilities.

"Buildings in Barrels" acclaimed by three awards.

A new and highly accurate electrical method of measuring the level of a vital body chemical called cholinesterase has been developed.

Quartermaster Corps report covers study of malnutrition ecology.

Senators back creation of Government Office of Science and Technology.

Army scientists are duplicating the intense pressures and temperatures existing deep in the earth's crust to create diamonds and other ultra-dense materials for use in electronics.

Ordnance Corps reviews foreign weapons progress.

Army developing an air-ground system for retrieving personnel or emergency cargo from small areas in rugged terrain or deep woods.

Army scientists are building a test-tube chunk of outer space to study the re-entry of intercontinental ballistic missiles at close range.

GIMRADA testing high-speed automated system of map reproduction, distribution, storage and display.

Weather slows Arctic supply train to 276 miles in 22 days.

Army semitrailer features hydraulically operated gooseneck coupling.

Army's expanding interest in materials research stressed to industry, educators at AROD parley.

### MAY

—R&D commands shape up as generals get new jobs.

Relocation of the U.S. Army Research Office in a new building scheduled to be completed early in June.

QMFCI breaks ground for \$3.8 million construction program.

Industry backs DOD, Armed Forces in drive to ease work on technical manuals.

U.S. Army Research Office-Durham hosts first Army-wide Operations Research Symposium.

Watertown Arsenal skilled craftsmen match automation on missile cases.

Army's work on lasers reported at international symposium.

Army teams with U.S. Coast and Geodetic Survey on new Arctic station.

The Army's diesel-powered all-aluminum amphibian LARC-15 completes successful land mobility and heavy surf tests.

An invention termed the "Chemical Typewriter" is acclaimed as a revolutionary solution to handling chemical information.

Army Ordnance Missile Command computers simulate missile performance to aid scientists in designing future systems.

Engineers develop sprayer using rotating dispenser.

Research Analysis Corporation finds solution to Army operations research problems.

Ordnance Corps reviews foreign weapons progress.

Air cavalry concept gets impetus from limited war.

Engineers testing machine for field data reduction.

Signal Corps establishes Strategic Communications Command.

Picatinny Arsenal opens new lab for explosives research.

U.S. Army nuclear power program serves remote area needs.

Watertown metallic process coats training devices.

U.S. Army nuclear power program activates three new plants.

### JUNE

—Army announces choice of 28 R&D Achievement Award winners.

President names Vance as successor to Stahr.

500 scientists to meet at biennial Army Science conference.

Defense Research Office set up in Regional Science Office, Latin America.

Army Medical Service leaders initiate far-ranging 5-year Medical RDT&E Program to meet forecasted requirements for war in any environment.

Quartermaster Food Radiation Research Facility heralded as the first of its kind in the world.

Joint U.S. Air Force-U.S. Army effort seeks data on long-range radio transmission from Australia.

The largest positive ion accelerator in the U.S. is now in operation at the U.S. Army Chemical Corps' Nuclear Defense Laboratory.

Research Analysis Corporation develops camera technique to zero in on M60 tank targets.

Texas display informs industry of Army needs for gas turbine engines when cost is reduced.

Engineer Labs develop organic paint stripper, solar reflecting paint.

Radar sketching device provides capability for transferring mapping data from side-looking radar photography to a controlled manuscript.

Chemical Corps researchers believe inhalant-type vaccine will safely immunize humans against tularemia.

U.S. Army mobile radiation counting laboratory serves many agencies.

Ordnance Tank Automotive Command developing self-propelled howitzer, XM-104.

National Science Fair-International stimulates scientific genius of rising generation.

Computers control artillery in White Plan III demonstration at USAEPG.

Radio transmitter and receiver weighing less than three ounces developed to explore the mysteries of the high sky.

Army-Navy researchers chart eight new islands in Antarctica.

### JULY

—60 authors win Army Science Conference awards, certificates.

Major commands in reorganization gain operational status.

Army activates Limited War Laboratory at Aberdeen Proving Ground, Md.

Personnel Research Office opens Officer Evaluation Center.

ASTIA proceeding with initiation of 19-point program.

Aeromedical Research Unit established to meet the need for specialized knowledge linked to the expansion of Army aviation.

Army's new "flexible wing" may let special troops glide to soft landings for remote area warfare.

Deputy ASA (R&D) cites potential of food radiation research at dedication of Army radiation facility at Natick, Mass.

Atomic research produces better luminescent paint.

USAEPG reports success of electronic switching for dial telephone calls.

Human factors studies yield device to protect ears from firing damage.

Army Ballistic Missile Agency "surgeons" probe missile defects.

An r.p.m.-limit warning system detects engine flame-out for turbine-powered HU-1 helicopters.

Transistorized MOBIDIC used to test AEPG firing systems.

Picatinny devised kit to anchor missile launcher in frozen ground.

### AUGUST

—Army Materiel Command activation "merges" Technical Services.

U.S. Army Materiel Command conducts program through seven major subordinate commands.

Army preparing to give Value Analysis Program "booster" shot.

Army assigns STOL development to Canadian firm.

Wild phototheololite added to White Sands Missile Range trackers will help pinpoint satellites.

Human Engineering Laboratory study evaluates "copters as assault weapon.

Project BATON aims at analysis of the life history of thunderstorms.

Army establishes Intelligence-Security Branch as a new basic branch for Army personnel.

Portable sea-water distillation unit passes test.

Charts of U.S. Army Materiel Command organization structure.

ARPA's Project VELA advances techniques of underground blast detection.

A narrow-bottom "skirt" enables balloons to soar aloft nearly twice as fast as conventional types.

Rolling Liquid Transporter passes final tests.

GIMRADA tests automated system for constructing mosaic maps.

USAEPG tests flash unit for night aerial photos.

Quartermaster R&E Command developing folding tanks for fuel for mobile forces.

Value analysis techniques cut cost of M-72 "pocket rocket."

Army scientists have created a flashing column of plasma, and are beaming radio signals through it.

Army Chemical research serves Nation's scientific progress.

Operation HARP, utilizing big guns for research, earns U.S. Army Canada's good will for assistance.

DOD sets up simplified transport control system.

**SEPTEMBER**—WRAIR dedicates new wing, biomedical research reactor; research expansion geared to remote area warfare requirements.

Recommendations in the Bell Report getting high priority treatment of Army R&D top management.

Beach emphasizes urgency of Limited War Laboratory work.

Idiophylaxis: A biological armor for the soldier.

Missile B program enters definitive phase.

Success of Army Micromodule Program backs expansion plan.

Picatinny Arsenal finishes \$600,000 Plastics-Adhesives Laboratory.

A powerful air-transportable miniature radio broadcasting system is being developed.

Production models of the T-114 personnel carrier are rolling off the assembly line.

## Dud Device Developer Blazes Tri-Service Career

Walter Szeley, an engineering technician at the U.S. Army's Picatinny Arsenal, Dover, N.J., is a quiet, unassuming man in his mid-forties. Had it not been for publicity he received recently as codeveloper of the Cross Country Retriever for the safe recovery of dud ammunition, few would know of him.

Still his remarkable and exciting military career is enough to gain him considerable and lasting notoriety. Walter has served in three branches of the military service—Army, Navy and Air Force. That in itself would warrant a story, but where Walter is concerned there is more.

Walter began his military career as a sailor in 1937. He attended the Navy's electrical and airborne armament school and became a mechanic. When the Byrd Expedition of 1939-40 was organized, Walter was one of the mechanics selected as a member of the crew because of his proficiency.

After nearly a year in Antarctica, servicing the expedition's planes, Walter left the Navy to join Carl L. Norden, Inc., of New York, as an automatic flight control mechanic.

With the advent of World War II, Walter signed up for flight training in the Army Air Corps. Commissioned a second lieutenant, he compiled a record of 97 combat missions as a fighter pilot in Europe.

When hostilities ceased he remained in the service in the newly

Operation SWAMP FOX II aimed at improving military transportation and communications capabilities in the tropics.

Sergeant missile goes into tactical test phase.

BASIPAC computer put under test at Huachuca.

Balloons form new base for "Building in Barrels" concept.

Tri-service VTOL aircraft program builds mock-up of experimental tilt-wing XC-142.

Special Warfare Office added in OCRD functional changes.

Rotation, transfers cut wide swath in U.S. Army Research Office staff.

Former USARO scientist gives view on information retrieval.

Scientist psychoanalyzes atoms he makes neurotic.

Contract provides for study of insects as biological agent detectors.

"Hummingbird" VTOL aircraft passes first test.

Germfree animal research aided by new feeding equipment.

Revised DOD instruction clarifies WSEG policies and responsibilities.

**OCTOBER**—Ad Hoc Group attacks problem of improving technical information flow.

Policies to strengthen in-house laboratory capabilities are prescribed in a new Army Regulation.

Aberdeen Proving Ground using gun probes to study high sky.

formed U.S. Air Force. When the Korean War began, he was shipped to the Far East battle front as maintenance officer of fighter outfits. Later he was assigned to the Strategic Air Command bomber base as director of aircraft maintenance.

Walter Szeley earned many citations during his military career, including the Distinguished Flying Cross, Bronze Star, Air Medal and Member of the Military Order of the British Empire.

Retired as a major last year after 22 years of military service, he continued his interest in mechanics and research as a Department of the Army civilian.



Maj Walter Szeley (Ret.)

DARPO phaseout tells of virtual completion of Army reorganization.

Vance takes firm stand as a vigorous proponent of Army air power.

Mobile plant produces nuclear-generated electrical power.

Course prepares nuclear power plant operators.

Army schedules first National Junior Science and Humanities Symposium at U.S. Military Academy.

Army Medical Service "Operation Challenge" bids for aid of industry on new field hospital equipment.

Research Analysis Corporation sets up European Operations Research Office.

New pay act super-imposed scale aids scientists, engineers.

Dugway unit links U.S. Coast and Geodetic Survey seismometry chain.

Portable telemeter ordered to collect data on soldiers.

Detrick scientists report isolation of potent poison.

MATS, Army, Air Force officials discuss C-141A aircraft tests.

Army skyhook anglers develop new soft recovery for air-drop packages.

Missile Command involved in TRADEX project for ARPA near Zeus missile site in Pacific.

Watertown Arsenal cuts production time using plastic tooling technique.

4-Year Army personnel study identifies accident-prone types.

R&D personnel garner most of Secretary of the Army awards.

**NOVEMBER**—23 Army task units spur development of program on technical information.

Army announces incentive contracts program to improve materiel, reduce lead time, costs.

Army researchers share in isolating German measles virus.

Army Research Office activates Advanced Technology Group.

Army report shows increased research on fuel cells.

The XM124, 105 mm. auxiliary propelled howitzer satisfies requirements of air delivery tests.

"Biological Window" invented by Army medic is believed to have wide potential application to research.

U.S. Army Engineer Waterways Experiment Station research seeks aerial analysis of soils.

Army develops system for rapid unloading of moving ships.

GIMRADA testing instrument that rectifies side looking radar photographs to permit use in planimetric maps.

Combat Developments Command conducting major experiment at Fort Ord, Calif.

U.S. Army Munitions Command reduces danger of dud analysis.

Army SATCOM Agency role in DOD satellite communications R&D explained.

Missile Command "ear" sounds secrets of Venus.

Memory unit doubles MOBIDIC storage capacity.

Canada delivers first XM571 utility carrier to U.S. under joint effort.

Army developing ideographic composing machine expected to revolutionize printing procedures.

U.S. Army Missile Command using new documentation system.

Army assigned responsibility to establish Defense Language Institute, monitor program.

U.S. Army Mobility Command studies methods of image intensification.

Human engineering concept applied to armored vehicle design.

Army Biological Laboratories "egged on" to biological research.

Quartermaster R&E Command sponsoring worldwide survey of insects.

U.S. Army Engineer Waterways Experiment Station builds dynamic load generator.

## MH-1A Floating Power Plant Design Added to Army Nuclear Power Program

Design of the MH-1A pressurized-water, floating nuclear power plant was completely recently for addition to the expanding line of compact reactors developed under the U.S. Army Nuclear Power Program. Award of a \$15,837,643 construction contract to Martin-Marietta Corp. was announced Dec. 28.

The 10,000 kilowatt MH-1A is designed to provide a source of reliable electric power at remote locations along navigable waterways without dependence on a continuous supply of fuel oil or coal.

The initial \$644,000 design contract was awarded in 1961 to Martin-Marietta Corp., Martin Co. Nuclear Division, Baltimore, Md. The Philadelphia Engineer District, procuring agency for the Army Corps of Engineers, awarded the contract.

The J. J. Henry Co. Marine Architects of Philadelphia was chosen to do the marine design, and the Maryland Shipbuilding and Drydock Co. of Baltimore is building the plant, scheduled to "go critical" in Fiscal Year 1966.

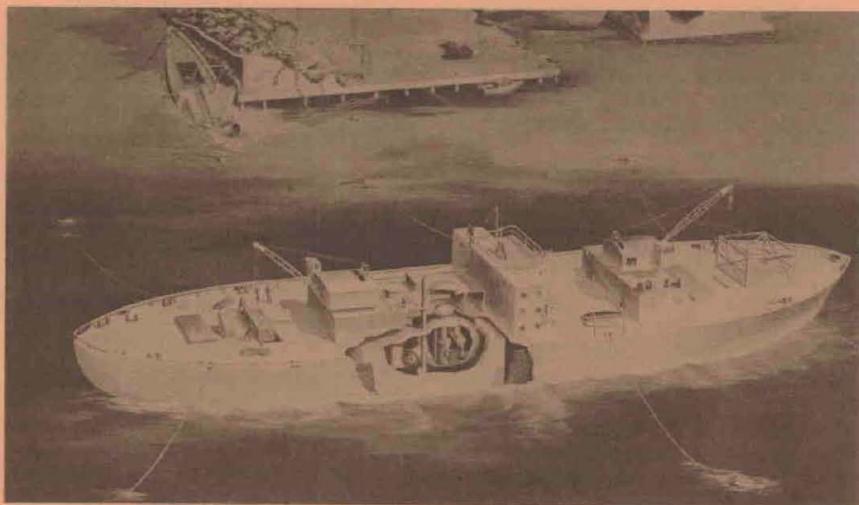
Capt Joseph P. Franklin, MH-1A Project Manager, Army Nuclear Power Program, said the idea of floating power plants is not a new one—a New Hampshire utility company converted an old freighter hull for use as an oil-fired power plant as far back as 1929.

Barge-mounted plants were used by the Army in the European and Pacific theaters during World War II and again in Korea. Presently, two are operating at separate sites on Okinawa and a third is supplying power to the Air Force at Thule, Greenland. One of the World War II barges was purchased and put to use by the Government of Brazil.

The concept of a floating power plant took substance in 1957, when the U.S. Army's first prototype nuclear reactor at Fort Belvoir, Va. demonstrated the feasibility of military use of nuclear power. Since that time, many significant advances have been made by the Army Nuclear Power Program in the establishment of permanent and portable nuclear power plants. (See May 1962 issue of *News magazine*, pp. 30, 36 for activation of new land-based plants and Nuclear Power Program.)

The MH-1A is not designed as a prototype. It will be a fully operational plant capable of supplying reliable electric power as required by its mission.

The plant will be mounted in the



MH-1A, 10,000 kilowatt, barge-mounted nuclear power plant.

hull of the *S.S. Walter F. Perry*, a Z-EC2 class Liberty ship taken out of "mothball" storage from the James River Reserve Fleet.

The hull of the *Perry* will be modified by replacing the midsection with a new 212-foot long mid-body. Overall length of the vessel will be 441 feet, with a maximum beam increased by the new mid-body to 65 feet. Design draft is 20 feet.

The reactor and reactor system is mounted on a single integrated structure within a containment vessel to minimize differential movement between components. The containment vessel is enclosed by a concrete, lead and polyethylene biological shield which forms a reactor access compartment.

Entrance to the containment vessel is gained through a personnel air lock. New fuel, spent fuel and waste storage are provided on board ship which give the MH-1A a capability of self-sustained operation for periods up to two years.

Three special features of the converted "barge" design include:

- No self-propulsion capability is included in the hull. Investment in this machinery, which would be idle for all but a small fraction of the vessel's life, is considered impractical.

- The collision barrier, extending 112 feet on either side of the hull outside of the reactor system, is designed to prevent penetration of a colliding vessel to within 12 inches of the reactor containment vessel or spent fuel tank.

- Crew's quarters are provided in the superstructure only for the personnel who will be on board during

towing of the vessel. When the barge is at anchor and producing power, the operating crew will live on shore.

The MH-1A is designed to operate at dockside or at anchor, supplying power through overhead or submarine transmission cables. It will be manned by a military crew, trained and certified in Army Nuclear Power Program facilities at Fort Belvoir, Va. Supplemental training for the operators will be conducted on the plant itself by the Martin Co. prior to turnover of the plant to the Army.

Because of the varied sites at which the plant will operate, a detailed analysis of the hazards of operation has been made for Fort Belvoir, where test operation of the plant will be accomplished.

To preclude the expense of detailed analyses at future operating sites, the Army Nuclear Power Program is developing general siting criteria which will assess the hazards of operation of MH-1A at any particular site in a minimum time and at a relatively low cost.

After the initial test operation at Fort Belvoir, it is contemplated that the MH-1A will operate in support of the Strategic Army Command (STRAC) requirements as directed by the Department of Defense.

In addition to its capability to meet mobile requirements for transient military operations along navigable waterways, the replacement of an equivalent conventional plant by MH-1A in a combat zone would reportedly eliminate a POL requirement of 80 tons per day—enough to supply a complete combat division.