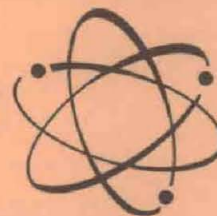




ARMY

RESEARCH AND DEVELOPMENT



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Army Regroups Structure Of Electronics Command Into 5 New Directorates

Restructuring of the U.S. Army Electronics Command at Fort Monmouth, N.J., was set in motion effective May 1, under a plan directed toward maximum efficiency in providing the Army with materiel, equipment and systems.

Maj Gen Frank W. Moorman, commanding general, announced the change and said command-wide operations will continue without interruption, despite the physical relocation of certain elements.

Movement of personnel between activities at Monmouth and Philadelphia will be minimal, he stated—less than 50 in each direction. Most of the relocation will be in the Monmouth area.

Activities of the subcommands of E-Command will be regrouped into an integrated command-wide, directorate-type organization. New directorates are the U.S. Army Electronics Research and Development Labora-

(Continued on page 6)

DDR&E Joint Discussion Forums Consider Approach To 'Management by Guidance' in Research Programs

DDR&E Joint Discussion Forums intended to provide the Defense Director of Research and Engineering with overall in-depth visibility of research plans of the Military Departments, and to improve coordination for "management by guidance" in planning and budgeting, have been put into operation.

Forum discussions began in mid-April and will extend to mid-May in the preliminary phase. Consideration at these nine meetings covers current research related to planned projects. The goal is to formulate step-by-step procedures for program analysis with uniform detail, down to subtask level, to insure conformity with established definitions for programing purposes.

Each of the Military Departments is represented by membership on the JDFs. Each Forum is composed of about 10 members, including one representative of each of the Services at research management level and one from the technical direction level. Each appointee is a recognized "competent senior research leader" selected, in the case of the Military Departments, by the Assistant Secretaries for R&D.

The four Forum groupings are: Physical Sciences, Engineering Sciences, Environmental Sciences, and Life Sciences. The PS Forum covers the four disciplinary areas of general physics, nuclear physics, chemistry, and mathematical sciences.

Similarly, the Engineering Sciences

(Continued on page 4)



Maj Gen George W. Power, Deputy Chief of Research and Development, will take over in July as CG, U.S. Army Southern European Task Force. He will be succeeded by Maj Gen Austin W. Betts. (See story p. 3).

CDC Leaders Attend Annual Commanders Conference

U.S. Army Combat Development Command leaders from seven major commands and 20 field agencies gathered at Fort Belvoir, Va., Apr. 7-8, for the second annual Commanders Conference.

Lt Gen Dwight E. Beach and his CDC headquarters staff participated

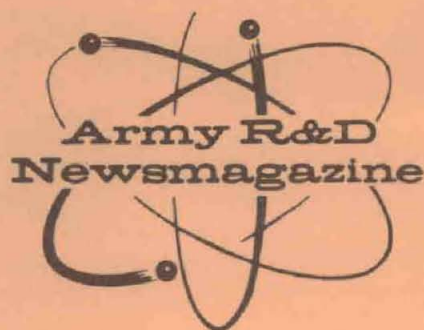
in briefings and discussions with leaders of the various CDC activities for the purpose of updating them on plans and objectives, progress on materiel developments, and to improve understanding of the work and responsibilities of each command. Much of the information was classified.



USACDC Commanders—First row (l. to r.), Maj Gen Kenneth G. Wickham, Combat Service Group, Fort Lee, Va. Maj Gen Harry J. Lemley, Jr., Combined Arms Group, Fort Leavenworth, Kansas; Commanding General (Lt Gen) Dwight E. Beach; Maj Gen William F. Train, Institute of Advanced Studies, Carlisle Barracks, Pa.; Brig Gen Charles J. Girard, Experimentation Center, Fort Ord, Calif.; Col Richard J. Darnell, Special Warfare Group, Fort Belvoir, Va. Second row, Col Jack F. Diggs, Command Control Information Systems 70 Group, Fort Belvoir; Col Arthur L. Sanford, Jr., Nuclear Group, Fort Bliss, Tex.

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PROMOTING SCIENCE IN THE COMMUNITY

By Major General (U.S.A. Ret.) Nelson M. Lynde
(CG, U.S. Army Weapons Command until Feb. 29, 1964)

Dedicated scientists, engineers and other personnel of the Army Weapons Command and its member installations are encouraging future scientists and engineers by sponsoring and promoting various scientific and educational activities in their respective communities.

The basic need for each community to encourage and promote scientific interest and activities has been recognized by the President's Science Advisory Committee and emphasized in saying:

"Education which produces clear, vigorous minds makes an essential contribution to the national strength; one, fortunately, which is of value alike for peace and for war, alike for the welfare of the State and of the individual.... Impending shortages of talented, highly trained scientists and engineers threaten the successful fulfillment of vital national commitments."

In addition, the President's Science Advisory Committee recommends that, "The Nation must take immediate steps to enhance its supply and utilization of manpower in all fields of science and technology, especially in the fields of engineering, mathematics and the physical sciences."

The USAWECOM Headquarters and Rock Island Arsenal activities are concerned with the area included in five major cities—Rock Island, Moline and East Moline, Ill., and Davenport and Bettendorf, Iowa, as well as many smaller towns in western Illinois and eastern Iowa within a 100-mile radius.

One of the first programs in which the Headquarters and Rock Island Arsenal participated was the Annual Quint-Cities Science Fair for Junior and Senior high school students. This program was initiated by the technical societies of the area, many of whose members are Government employees. The Arsenal loans equipment as well as providing at least one science seminar on a Saturday morning for interested students.

The director of the 1963 Science Fair and half of the Steering Committee were employees of the Arsenal. A technical consultant list is assembled each year by the Research Office of the Headquarters. This list is made up of local leaders in the various scientific disciplines who assist students as necessary.

A week's tour of duty is offered by Rock Island Arsenal to the student with the best project in each of the fields of math, chemistry, physics and engineering. This tour of duty offers the student an opportunity to work along with scientists and engineers, to observe the problems they meet, to see how they go about solving them, to use the laboratory and engineering equipment and, it is hoped, to note the satisfaction Government scientists and engineers gain from their work in Army research and development.

The Advisory Committee on Science Education, whose chairman is the chief of the Headquarters Research Office, attempts to coordinate scientific activities within the area. Some of its activities have included the donation of surplus laboratory equipment by industry to the local schools and the donation of magazines and books by industry to the local public libraries so that the latest information is available to the students for their research. Assistance has also been given in the borrowing of equipment from industry that was too expensive for the student to purchase for his science fair project. In fiscal year 1963, the Army Weapons Command donated surplus equipment worth more than \$819,000 to various educational institutions in the Illinois-Iowa area.

The Junior Science and Humanities Program, which originated at the Army Research Office-Durham, N.C., calls for scientifically talented senior high school students to write and present papers to a selected group of their fellow students in a manner similar to a professional at a technical society meeting. The second phase of this program is the observation of the scientist at work. This program was cosponsored by the Headquarters U.S. Army Weapons Command and the State University of Iowa for students in the States of Iowa and western Illinois. Many teachers who attended stated these were the most worthwhile three days they had ever spent in school activities.

Explorer Scout posts also are sponsored by the Command at which teenage boys are given an overall view of the work done, requirements and restrictions of the profession and actually do some elementary work in engineering or chemistry. This permits the boys to become familiar with the work involved in the respective professions as a possible impetus to future career interests.

(Continued on page 30)

State Department Creates Joint Foreign Area Research Group

Search the background for stimuli responsible for organization of a new high-level interagency group known as FAR (Foreign Area Research Coordination Group) and a 1962 Army conference emerges as a motivating factor.

Behind the first FAR meeting in mid-April, under sponsorship of the U.S. Department of State, is the "U.S. Army's Limited War Mission and Social Science Symposium" held Mar. 27-29, 1962. That meeting drew more than 300 invited representatives of the Department of Defense, Government executive agencies, non-Government social science institutions and Army agencies.

Several other factors, of course, contributed to the build-up of support for the creation of FAR, with important influence coming from the series of Congressional hearings during recent months to inquire into ways and means of integrating overall U.S. effort to minimize duplicative activities.

In the build-up process which led to FAR, the State Department "carried the ball," a credit cliché used by Dr. Lynn E. Baker, chief psychologist, U.S. Army. Assigned to the Human Factors and Operations Research

Division, U.S. Army Research Office, Dr. Baker was one of the chief planners of the 1962 Army conference.

Terms of reference were approved and the formal organization of FAR was adopted at its first meeting, resulting in selection of William J. Nagle as chairman and Daniel Fendrick as executive secretary. Dr. Nagle is director, External Research Staff, Department of State, and Mr. Fendrick is his deputy.

Judging by the high-level representation of major Government and State Department agencies participating in the first session, when discussion centered on China, future FAR meetings are destined to have an important impact on planning and coordination of foreign research.

The pattern for future sessions on other countries was provided by Allan S. Whiting, director, Office of Research and Analysis for Far East, State Department, when he spoke on China. He explained trends and the direction of Government-sponsored research in China, gaps and future needs, resources and the various factors in research planning.

FAR will be concerned with such aspects of foreign research planning

as public administration, political change, agricultural and marketing economics, rural sociology, local customs and folkways, population groups and classes—all of which are related to U.S. Army interests in non-material research and development in support of limited war.

Terms of reference approved for FAR state the purpose as "the systematic coordination of Government-sponsored foreign area and cross cultural research in the social sciences. The Group will attempt to insure cooperative effort in research activities, to prevent duplication between agencies, to encourage maximum use of research results, and to promote efficient use of private research capabilities. . . ."

The agreement among agencies insures decisions will be in the form of recommendations and will not be binding—simply a suggested basis for action. The Group will not exercise a veto power nor otherwise attempt to direct the research program of any agency. On occasion, research recommendations will be disseminated to the general scientific community.

Initial membership in FAR includes the Department of State Bureau of Intelligence and Research as well as its Bureau of Educational and Cultural Affairs. The Department of Defense is represented by the Advanced Research Projects Agency, Office of Defense Research and Engineering, International Security Affairs, and Departments of the Army, Navy and Air Force.

Additional FAR membership is provided by the Agency for International Development, Central Intelligence Agency, U.S. Arms Control and Disarmament Agency, U.S. Information Agency, the National Science Foundation, U.S. Department of Agriculture, and the Office of Science and Technology.

The External Research Staff of the Department of State will serve as the Secretariat for the Group. Among its assigned duties are: Arrange for meetings, provide the staff and record the minutes; distribute documents or other working papers resulting from Group meetings or prepared by member agencies.

The Secretariat also will prepare and disseminate analytic presentations to Government external research programs, past, present and planned—based on information submitted by member agencies—and will follow up Group decisions with the assistance of agency representatives.

Deputy CRD Maj Gen Power Assigned as SETAF CG

Maj Gen George W. Power, Deputy Chief of Research and Development, since July 1962, will report about July 1 as commanding general, U.S. Army Southern European Task Force.

Named to relieve him is Maj Gen Austin W. Betts, who came to OCRD Feb. 7 as special assistant for a Nike X Threat Analysis Study.

From April 1960 to July 1962, General Power served as Director of Developments, OCRD. Previously he was deputy CG of the U.S. Army Air Defense Center, and later CG of the First Guided Missile Brigade at Fort Bliss, Tex.

A graduate of the U.S. Military Academy in 1932, General Power served with the 247th Field Artillery Battalion of the "Americal" Division in the South and Southwest Pacific Theaters in World War II. During the Korean War, he served with General MacArthur's headquarters.

MAJ GEN BETTS, from 1961 until his assignment to OCRD, served as director of Military Applications, Atomic Energy Commission, Germantown, Md. For the preceding two years he was military assistant to the Director of Defense Research and Engineering.

A 1934 graduate of the U.S. Military Academy and holder of an M.S. degree from Massachusetts Institute of Technology, his World War II service was in India and China, earning for him the Legion of Merit. His career in research and development began in 1945 at Los Alamos, N. Mex., scientific laboratories. He previously had served directly under the Chief of Research and Development in 1952. (See March 1964 issue, page 3, for a detailed biographical sketch.)



Maj Gen Austin W. Betts

DDRE Forums Consider Research Planning, Budgeting

(Continued from page 1)

Forum areas are electronics, materials, mechanics and energy conversion. The Environmental Sciences Forum areas of interest are oceanography, terrestrial sciences, atmospheric sciences and astronomy-astrophysics. Life Sciences is broken into two major areas: biological and medical sciences, and the behavioral and social sciences.

The Forums will provide "flexible and adaptive channels of inter-service communication from which general information on the research posture of the Department of Defense can be inferred."

As the occasion demands, each of the Forum groups is authorized to supplement its representation from the scientific community. Attendance at Forum meetings generally will be restricted to appointees, members of the Defense Committee on Research and the Defense Science Board, representatives of the Defense agencies, and those selected by the Assistant Secretaries (R&D) of the Military Departments.

The ODDRE leaders designated by Dr. Brown to serve as JDF chairmen are:

Physical Sciences, Dr. Edward M. Reilly, acting assistant director for research; Environmental Sciences, Dr. Chalmers W. Sherwin, the new director for science and technology; Engineering Sciences, Dr. Earl T. Hayes, assistant director for materials; Life Sciences, Col Frederick Frese, chief of Life Sciences.

Department of the Army representation on the JDFs consists of the same men appointed by Assistant Secretary of the Army (R&D) Willis M. Hawkins early in January to serve on the new Army Research Council, under the chairmanship of Dr. Ralph G. H. Siu, scientific director, Army Materiel Command.

TARC has the same concept of representation as the JDFs in that it gives equal voice to management and the Army In-House Laboratories—one member for each in the Physical and Mathematical Sciences, Engineering Sciences, Environmental Sciences, and Life Sciences.

Dr. Siu reported late in April that TARC would complete its report, based on daily discussions in which top scientific talent within the Army has participated, for delivery to Secretary Hawkins strictly on assigned schedule, that is, early in May.

Director of Army Research Brig

Gen Walter E. Lotz, Jr., has served as TARC coordinator. General Lotz also is the Army representative on the Defense Committee on Research and his scientific director, Dr. I. R. Hershner, Jr., is alternate.

In that it deals with medium- and long-range objectives of an Army Research Plan, including programing procedures, facilities, scientific and engineering personnel required, funding levels and other aspects, the voluminous TARC report is restricted in circulation until approved for broader use and dissemination.

TARC members who are serving in the same disciplinary capacity on the Joint Discussion Forums, listed in each case with the management representative first and the laboratory leader second, are:

Physical and Mathematical Sci-

New History Illuminates AFIP's Century of Growth

The first complete history of the world-famous Armed Forces Institute of Pathology in Washington, D.C., is now available to the public, AFIP Director Brig Gen Joe M. Blumberg has announced.

Written by Civil War historian Dr. Robert S. Henry, it traces the growth of the Institute from its inception as the Army Medical Museum, with an annual appropriation of \$5,000, to its present prominence as one of the world leaders in pathology.

The Museum, which has occupied several different buildings in downtown Washington, including the Ford Theater building, is now housed in an 80-year-old red brick building at 7th St. and Constitution Ave. The Institute itself is in a \$7 million, windowless and bomb-proof building on the grounds of the Walter Reed Army Medical Center.

Titled "The Armed Forces Institute of Pathology, Its First Century, 1862-1962," the history offers a detailed, and often dramatic, account of the growth of pathology as a recognized science and of the Museum's struggle in its early years, first to stay in existence and then to find enough room to grow in.

The Museum was founded in 1862 after a directive was issued by the Army Surgeon General William A. Hammond to field hospitals to submit surgical specimens from the wounded. A century later, it has attained an influential role in global medicine and has attracted eminent medical specialists from all over the world.

The AFIP became a tri-service or-

ences: Dr. J. V. R. Kaufman, chief scientist, Munitions Command, Army Materiel Command; Dr. C. W. Lampson, technical director, Ballistic Research Laboratories, Army Materiel Command.

Engineering Sciences: Dr. Gilford Quarles, chief scientific adviser, Office of the Chief of Engineers; Dr. S. B. Levin, deputy director, Institute for Exploratory Research, Army Electronics Research and Development Laboratories.

Environmental Sciences: Dr. Leonard S. Wilson, chief, Environmental Sciences Division, Army Research Office; Dr. Donald M. Swingle, senior scientist, Meteorological Division, Army Electronics R&D Labs.

Life Sciences: Col Tyron Huber, chief, Life Sciences Division, Army Research Office; Col William D. Tigert, director, Walter Reed Army Institute of Research.

ganization in 1949 and is noted as one of the top few centers for research, education and consultation in pathology.

"The volume, aside from its lasting historical value, is a must for any individual connected with modern medicine," Gen Blumberg said, "and even more for those whose work carries them into the realm of pathology."

Copies of the history can be obtained at \$4.25 each from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

USAPRO Observes 25 Years Of Growth as Research Unit

Twenty-five years of progressive growth in research activity directed toward techniques of identifying skills and potential development capabilities of Army manpower, in the interest of effective utilization, provided the occasion for an Apr. 30 open house at APRO.

APRO stands for Army Personnel Research Office, a redesignation effected when the agency passed from control of the Office of The Adjutant General to the Office of the Chief of Research and Development. APRO's program is monitored through the U.S. Army Research Office.

Commanded by Col. Charles S. Gersoni, APRO has a professional staff of about 75 scientists and engineers assigned to five laboratories, including a computerized statistical laboratory and electronically equipped experimental facilities.

Project HARP Leads to U.S.-Canada Study of Low-Orbit Program

Jointly funded acceleration of Project HARP (High Altitude Research Program), currently conducted under U.S. Army sponsorship, was discussed at a recent meeting of Canadian Department of Defense and McGill University of Canada officials.

Considered was the development of low-orbital capability for the 16-inch gun emplaced in Barbados, West Indies Federation, in the fall of 1962 as a joint U.S. Army-McGill University venture initiated by McGill and supported by the Army.

U.S. Army representatives stated that their interest in the program is confined to research on techniques, instrumentation, vehicles and related aspects. Canadian Department of Defense participation in an accelerated and expanded program, it was stated, would be welcomed.

Research aimed at developing low-orbital capability for geodetic and atmospheric objectives would be within the U.S. Army area of interest, one of the spokesmen explained, and therefore in consonance with aims of the Canadian defense establishment. Involved would be an increase of 50 to 100 percent in altitudes achieved with the 16-inch gun in firings to date.

As proposed, acceleration of effort would begin in the near future. Action was favored to effect a memorandum of understanding relative to the scope of the program, subject to approval of research and development chiefs of the U.S. Army and the Canadian Government. Plans call for establishment of a steering committee of U.S. and Canadian officials to advance the program.

McGill University officials developed the original concept of Project HARP with assistance of the U.S. Army, which moved two obsolete 16-inch naval gun barrels to Barbados to initiate the program. (For a detailed description, attention is invited to the August 1962 and March 1963 issues.)

U.S. Army representatives who attended the recent meeting with Canadian leaders included Dr. Hoyt Lemons of the Army Research Office staff as chairman, Lt Col Kenneth G. Groom and Maj Wallace H. Hubbard of the Office of the Chief of Research and Development, Robert R. Philippe of the Army Materiel Command and Dr. Charles Murphy, Ballistics Research Laboratories, Aberdeen, Md.

Project HARP grew out of a 1959 feasibility study by the Canadian Armament Research and Development Establishment to send a 3.3-inch in-

strumented spinning projectile to 100,000 feet.

The U.S. Army Ballistics Research Laboratories conducted studies in 1960 at Aberdeen Proving Ground, Md., which resulted in a series of probes, fired from smooth-bore 5-inch guns, to altitudes exceeding 220,000 feet. In July 1963, firings at Barbados reached 335,000 feet.

With improvements in probe vehicles and gun-launching systems resulting from the cooperative efforts of McGill University, the BRL and the U.S. Army Research Office, Project HARP has gained in scientific interest. The relatively inexpensive gun-launched probes have proved capable of exploring altitudes above those attainable by research balloons.

As this publication went to press, a

U.S., Foreign Scientists Exchange Aeroballistic Info

Scientists of 12 United States and foreign government laboratories exchanged knowledge and theories at the recent sixth meeting of the Aeroballistic Range Association.

Sessions for the first two days were held at Aberdeen Proving Ground, Md., home of the U.S. Army Ballistic

Research Laboratories, and on the final day at the Lincoln Laboratory of Massachusetts Institute of Technology, Lexington, Mass. The APG and MIT were joint sponsors of the conference.

Twenty-five technical papers were presented on subjects ranging from design of range facilities and stability of scale models through structural behavior, hypervelocity guns, air flow phenomena, fluid dynamics and impact under controlled laboratory conditions.

The presentations covered current work at aeroballistic ranges where models of space vehicles and missiles are launched, for experimental purposes, at velocities up to 30,000 feet per second in simulated altitudes from sea level to 300,000 feet.

Ranges represented at the meeting included: von Karman Gas Dynamics Facility, Arnold Air Force Station, Tenn.; Canadian Armament Research and Development Establishment, Quebec; Ames Research Center, National Aeronautics and Space Administration, Moffett Field, Calif.; U.S. Naval Ordnance Laboratory, White Oak, Md.;

U.S. Naval Research Laboratory, Washington, D.C.; Institut Franco-Allemand de Recherches de Saint Louis, France; Laboratoire de Recherches Balistiques et Aerodynamiques, France; Royal Armament Research and Development Establishment, England; Lincoln Laboratory, MIT; Denver Research Institute, Colo.; Lewis Research Center, NASA, Cleveland; and Ballistic Research Laboratories, APG, Md.

U.S. Naval Research Laboratory, Washington, D.C.; Institut Franco-Allemand de Recherches de Saint Louis, France; Laboratoire de Recherches Balistiques et Aerodynamiques, France; Royal Armament Research and Development Establishment, England; Lincoln Laboratory, MIT; Denver Research Institute, Colo.; Lewis Research Center, NASA, Cleveland; and Ballistic Research Laboratories, APG, Md.

U.S. Naval Research Laboratory, Washington, D.C.; Institut Franco-Allemand de Recherches de Saint Louis, France; Laboratoire de Recherches Balistiques et Aerodynamiques, France; Royal Armament Research and Development Establishment, England; Lincoln Laboratory, MIT; Denver Research Institute, Colo.; Lewis Research Center, NASA, Cleveland; and Ballistic Research Laboratories, APG, Md.

U.S. Naval Research Laboratory, Washington, D.C.; Institut Franco-Allemand de Recherches de Saint Louis, France; Laboratoire de Recherches Balistiques et Aerodynamiques, France; Royal Armament Research and Development Establishment, England; Lincoln Laboratory, MIT; Denver Research Institute, Colo.; Lewis Research Center, NASA, Cleveland; and Ballistic Research Laboratories, APG, Md.



Physicists from Europe and North America pause beside design of a Mach-Zehnder interferometer, used to display air density patterns surrounding models in free flight, during Aeroballistic Range Association meeting at the U.S. Army Ballistic Research Laboratories, Aberdeen Proving Ground (APG), Md. Left to right are G. H. Tidy, Canadian Armament Research and Development Establishment; Dr. Charles H. Murphy, chief of the Ballistics Research Laboratories' Free Flight Aerodynamics Branch, APG; W. G. Clay, Massachusetts Institute of Technology; and Claude Lecomte, Institut Franco-Allemand de Recherches de Saint-Louis, France.

Army Regroups Structure of Electronics Command Into 5 New Directorates

(Continued from page 1)

tories, Procurement and Production, Materiel Readiness, and Personnel and Training. New also is the Electronics Support Command.

General Moorman said that along with restructuring operating and supporting activities, the Commodity Management Offices will be regrouped and strengthened. Functioning as headquarters staff elements, they are responsible for the life-cycle management, from concept through disposal, of designated items or systems.

A main distinction is that the operating elements are primarily responsible for carrying out their respective missions—research and development, procurement and production, and materiel readiness—whereas the “intensive” management the Commodity Office gives the specific items extends across all of these areas.

As one of the principal features embodied in the directorate form of electronics commodity management, the staff elements of E-Command headquarters and the supporting staffs of the major subordinate agencies are being combined within the integrated operating activities. This will eliminate what planners term “staff layering.”

To achieve a better balance of command viewed as essential to the new structure, two deputy commanders, both brigadier generals, will be appointed. One will be responsible for Plans and Programs; the other for Operations.

General Moorman said the reorganization reflects the emphasis the Administration, the Department of Defense, and the Department of the Army place on continuing improvements in governmental efficiency.

Summarized objectives are: To obtain the most efficient and economical use of available resources; to assure strongly integrated management of electronic commodities throughout their life cycle; to assure a better balance between planning and programming and the direction of operations; to strengthen the materiel acquisition cycle; to establish a closer correlation between the functional groupings of E-Command and its parent Army Materiel Command.

Among the benefits expected from the reorganization is “greater mission effectiveness through intensified management of electronics items and systems from their concept to their disposal.”

Higher employee productivity and

quicker reaction time are expected through better use of staff personnel, reduction in command echelons, functional and physical regrouping of staff and operating elements, and consolidation of support functions.

In turn, these benefits within the Command should make possible greater responsiveness to the needs of Army materiel users, and a substantial reduction in the time required to translate new concepts into end items for field operations, General Moorman stated.

In commenting on events that preceded the restructuring, he said that E-Command is one of seven subcommands under the Army Materiel Command. The AMC was created in 1962

as one of two powerful new commands during reorganization of the Army Technical Services.

Extensive studies since then have been directed toward revising structure of the subcommands in the manner that best equips them for carrying out their respective activities within the cohesive framework of the parent AMC.

Effects of the consolidation will extend throughout the headquarters and subordinate commands, but regrouping will have the most impact on three major activities.

Besides the Laboratories, these are the U.S. Army Electronics Materiel Support Agency, in the Fort Mon-

CSC Schedules Seminar Series for May-June

The U.S. Civil Service Commission's Office of Career Development is sponsoring a series of seminars and courses in May and June to improve the development of managerial and first-line supervisory and employees.

An Executive Seminar on Management Information Systems, limited to career executives (GS-15 or equivalent), is scheduled May 21-22 at the CSC Building, Room 1340, 1900 “E” St., N.W., Washington, D.C.

Led by outstanding authorities in business and Government, the sessions will emphasize new developments in management sciences—especially operations research and the computer—as they relate to information systems for management.

A program on Basic Concepts in Government Operations will be presented at the CSC Building, Room 1340B, June 8-12. Open to new technical, administrative and professional employees in grades GS 5-9, it is designed to complement agency orientation. Discussions will explore how the Federal Government is organized, how it operates, and why it is different from other organizations.

A 40-hour course on Supervision and Group Performance, open only to GS-11 and higher grade supervisors, or those in equivalent grades, is scheduled June 10-16. Agencies will submit nominations in priority order to the associate director, Supervisor Training, Office of Career Development, U.S. Civil Service Commission, Washington 25, D.C. The course will cost about \$60.

A Management-Employee Group Relations Seminar, developed with the cooperation of the CSC's Bureau of Programs and Standards and the In-

teragency Advisory Group Committee on Employee-Management Cooperation, will be conducted June 15-17.

Participation will be open to about 35 Federal managers and staff assistants who have a need to gain knowledge about the growing field of management-employee group relations, which in turn will serve to strengthen managerial skills in this vital area.

Further information about the programs may be obtained through the Office of Career Development, U.S. Civil Service Commission, Washington, D.C. 20415.



DAVY CROCKETT projectiles at Picatinny (N.J.) Arsenal capture attention of recent visitors from the Army Materiel Command (AMC) R/D Division. L. to R. are Gerald Burke, AMC Nuclear Branch; A. L. Dorfman, Picatinny technical assistant to the CO; Brig Gen William C. Gribble, chief, AMC Development Division; Col E. B. Crossman, chief, AMC Weapons Branch; and Leroy Meeker, chief of the Nuclear Weapons Division at the Arsenal.

mouth area, and the U.S. Army Electronics Materiel Agency, centered in Philadelphia.

Other subordinate activities are Headquarters, Fort Monmouth; the Army Avionics Field Office, St. Louis; the Army Intelligence Materiel Development Agency, Fort Holabird, Md.; the Army Electronics Research and Development Activities at Fort Huachuca, Ariz., and White Sands, N. Mex.; the Army Electronics Logistics Research Office, Philadelphia; the Army Electronics Command Inspector General Field Office, Philadelphia; and the Army Electronics Regional Labor Office, Philadelphia.

In the organizational changes in research and development, the Army Electronics R&D Activities at White Sands and Fort Huachuca will now receive program guidance from the Headquarters Electronics Command. The Hexagon Building at Fort Monmouth continues as the principal center of R&D operations. The sizeable Evans Area, near Belmar, and smaller sites in Monmouth County remain integral parts.

Procurement and production operations formerly centered in the Electronics Materiel Agency are now assigned to the Procurement and Production Directorate. Based in the Coles Area, Lincroft, at Fort Monmouth, presently the site of the Electronics Materiel Support Agency, the Directorate has responsibility for letting contracts to industry for quantity outputs of military equipment.

The Production and Specifications Engineering Department of the Electronics Materiel Support Agency will become a part of the P&P Directorate. Procurement contracting functions now carried on in Philadelphia will remain there, but under the direction of the Coles-based Directorate, which will continue the procurement operations at Washington, D.C., and Fort Meade, Md.

Although subordinate Materiel Readiness functions will be carried out at other points, Philadelphia becomes the center of activity as well as the headquarters of this Directorate. Responsible for the third and final phase of life-cycle equipment management, its operations include managing the worldwide inventory of Army electronics items, determining requirements, controlling distribution, and allocating maintenance activities.

As an integral part of the operation, a Materiel Readiness Field Office, designated a National Maintenance Point, remains at Fort Monmouth. This office has been a part of the Army Electronics Materiel Support Agency.

A National Inventory Control Point, which has operated as part of the Army Electronics Materiel Agency in Philadelphia, remains there as part of the new Directorate. Other elements to remain at their present sites include the Plant Inventory Control Office, Washington; the Intelligence Materiel Development Agency, Fort Holabird, Md.; the Army Avionics Field Office, St. Louis; and the meteorological Teams, Fort Monmouth.

The New Equipment Introductory Team, formerly under the direction of the Laboratories, will become part of the Materiel Readiness Directorate. Team members, who travel widely to teach troops in the field how to operate and maintain new equipment, will continue to be based at Fort Monmouth.

The other two activities, Personnel and Training, and the Electronics Support Command, will have headquarters at Fort Monmouth.

The new Personnel and Training Directorate will combine the present Electronics Command headquarters staff functions in those areas and the activities that have been spread among the subordinate elements.

At Fort Monmouth, the commanding officer of the Electronics Support Command will be in charge of administration of the post and direct installations and services. A field division will be maintained in Philadelphia.

Among the new activities being established as a Command facility are a Computation Center, under the staff supervision of the Management Science and Data Systems Office, and a Financial Management Center, under the Comptroller and Director of Programs. Each will have Philadelphia divisions.

As part of the reorganization plan, General Moorman recently appointed special assistants to the commanding general for Technical Relations and for Congressional Affairs, and established a Quality Management Office.

Newly appointed also is an Army coordinator for the AIMS program. This is a tri-service undertaking to establish an automatic aircraft identification system for military use that would be compatible with the air traffic controls the Federal Aviation Agency employs for automatic identification of civil aircraft.

Some job spaces are being eliminated under the consolidation but the small number of persons affected will be given an opportunity to move into undermanned areas.

Among transfer of positions in the regrouped elements, there are less than 50 scheduled to be moved from Philadelphia to Fort Monmouth, and

also fewer than 50 such moves planned for the opposite direction. A Command spokesman said that since it is expected that some of these employees can exchange similar jobs, the figure may be even lower.

The top-level command group of the Army Electronics Command will move from Russel Hall, on the main post, to the Hexagon Building by Oct. 1. All other physical moves are to be complete by Dec. 31.

All of the regrouped activities in Philadelphia will be located in the building at 225 South 18th Street.

Quasi-Optics Meet Scheduled

A Symposium on Quasi-Optics, sponsored by the Microwave Research Institute, Polytechnic Institute of Brooklyn, will be held in New York City, June 8-10.

The symposium will provide a review of the present status of quasi-optic research and a forum for discussion of outstanding advances of interest to engineers and physicists. Scientists presenting papers at the symposium will represent industrial and academic facilities in the U.S., England, France, Italy and the Netherlands.



ON DUTY IN SOUTH VIET NAM, Capt Fred K. Mahaffey receives Legion of Merit for "exceptionally outstanding, meritorious service" as a junior test officer at the U.S. Army Infantry Board, presented by Maj Gen Charles J. Timmes, chief of MAAG. Capt Mahaffey was cited for "three unusually valuable contributions" in designing and fabricating a model of an adaptation kit for mounting the M-40A1 106 mm. recoilless rifle on a ¼-ton truck, for similar work in mounting the M-18A Claymore (anti-personnel) mines to vehicles for counter-ambush protection of motor vehicle convoys, and for a concept drawing which helped to achieve selective stabilization of the 120 mm. recoilless rifle when vehicle mounted.

USARO Sets Up Pilot Information ADP System

Advanced scientific and technical information and data centers planned for the future, as the Army establishes a centrally coordinated, decentrally operated network, have a fore-runner at the Army Research Office, Arlington, Va.

The system in operation at USARO Headquarters is a mechanized method of collecting, processing and disseminating information on research in progress, involving about 4,500 projects, tasks or subtasks.

To satisfy varied needs of Army scientists, engineers, project officers and managers, the system processes scientific-technical and administrative-management information submitted on Army Research Task Reports.

Each of the ARTRs concisely describes an Army research effort at the project, task or subtask level. In addition to the report, or "hard copy," the developing agencies submit the research information as data on punched cards for rapid automatic data processing to produce specific knowledge.

Still in the early stage of development, the USARO system at present includes more than 75,000 punched cards covering the 4,500 research efforts. The result is an up-to-date reference source for on-going Army research which serves the goal of fully integrated research planning and programing.

The file of factual and timely research reports furnishes a basis for technical review and analysis, and for internal coordination of the Army program. The information also facilitates exchange among similar research efforts of Department of Defense and other Government agencies.

Huachuca Engineer Retires

Raymond A. Forcier, chief engineer, Avionics and Meteorology Division, Test Programs and Evaluation Department at Fort Huachuca, Ariz., has retired after 32 years Federal service.

A specialist in the design, test and evaluation of air navigational aids, he returned recently from a trip to Fort Greely, Alaska, where he helped to plan the instrumentation facilities for the Arctic Test Board. He came to Fort Huachuca in 1954.

Formerly he worked for the Civil Aeronautics Administration, now the F.A.A., and prior to that spent 11 years with the Air Force Technical Development Center, Wright-Patterson AFB, Dayton, Ohio.

The system uses electronic accounting machines (EAM) and automatic data processing (ADP) equipment for mechanized search and retrieval within the punched card data bank. Information can thus be given quickly to individual requestors. Data can be reproduced as machine runs for special publications.

The system's overall capability is complemented by a browseable information retrieval known as Termatrix in conjunction with the EAM and ADP equipment. Combined techniques

Services to Send NSF-I Winners to Japan Fair

An added incentive for one of about 20 winners selected by Army judges at the 15th National Science Fair-International at Baltimore, Md., May 6-9, is a trip to the Japan Student Science Awards in Tokyo, Nov. 2-8.

The Army winners, as in previous years, each will receive an all-expense paid visit to an Army laboratory to observe research in progress in each student's area of interest. About 10 students will be offered summer employment in Army laboratories.

The Army award selectees will be chosen from more than 400 NSF-I entries, all winners of regional fairs.

Chief of Research and Development Lt Gen William W. Dick, Jr., approved late in April the Army's participation with the Air Force and the Navy in the Japan Science Awards.

Initiated in 1963, the Tri-Service participation (one NSF-I winner selected by each) was acclaimed a noteworthy success in stimulating good will among the Japanese people.

Dr. J. Fred Oesterling of the U.S. Army Natick (Mass.) Laboratories has succeeded Dr. Paul A. Siple as chairman of the Army judges. Dr. Siple, currently on a 2-year leave of absence from the U.S. Army Research Office while serving as science attache for the Department of State in Australia, had served as chairman ever since the Army began NSF-I support.

Other members of the judges panel are: Lt Col Timothy G. Barila, chief, Department of Resuscitation, Division of Surgery, Walter Reed Army Institute of Research, Washington, D.C.; Dr. Harold A. Zahl, Director of Research, U.S. Army Electronics R&D Laboratories, and his deputy, Norman J. Field, Fort Monmouth, N.J.; Dr. Brennie E. Hackley, research chemist, U.S. Army Chemical R&D Laboratories, Edgewood Arsenal, Md.;

Dr. Charles Hassett, assistant chief,

permit flexible, multilevel use of information by the managers and scientific personnel in Army research.

As the USARO system becomes more refined, it will use advanced techniques for communications, processing and transmission. Future developments will be implemented in liaison with other military services within the Department of Defense and with the scientific community.

The scientific and technical information network that evolves from the current activities, an Army spokesman said, is expected to improve the use of available information to strengthen the Army's R&D program.

Physiological Division, Chemical R&D Labs, Edgewood; Maj Alvin Hylton, research entomologist, U.S. Army Biological Laboratories, Fort Detrick, Md.; Dr. Henry Kalmus, chief scientist, Harry Diamond Laboratories, Washington; Lt Col William F. MacDonald, chief, Department of Experimental Surgery, Walter Reed Army Institute of Research;

James E. Malcolm, Office, Chief of Engineers, Washington; 1st Lt Gerald R. Miller, Nuclear Defense Laboratories, U.S. Army Chemical Center, Edgewood; Dr. Edwin H. Rogers, Ballistic Research Laboratories, Aberdeen Proving Ground, Md.; Lt Col Wendell G. Van Auken, acting chief, and Jack B. Fenn, Special Activities Branch, Army Research Office, Office Chief of Research and Development.



Lt Gen William W. Dick, Chief of Army Research & Development, and Col Keith T. O'Keefe, Watervliet (N.Y.) Arsenal commanding officer, examine mock-up of gun launcher for Shillelagh-Sheridan weapon system during recent tour of research and engineering laboratories and manufacturing facilities. Accompanying General Dick were H. G. Cronin, Col H. L. Nolan, and Lt Col J. E. Craig of the Office, Chief of R&D.

Materiel Command Announces General Changes, Promotions

General officer changes and promotions recently in the U.S. Army Materiel Command were highlighted by the nomination of Commanding General (Lt Gen) Frank S. Besson, Jr., for 4-star rank.

Maj Gen Jean H. Engler, who has been serving as deputy CG, has been nominated for lieutenant general and assigned to Headquarters, Supply and Maintenance Command, Washington.

Maj Gen William B. Bunker, who has succeeded General Engler as deputy CG, was serving as comptroller and director of programs for the U.S. Army Materiel Command.

Maj Gen Frank H. Britton, who was AMC Director of Research and Development, has been assigned deputy commander, Second U.S. Army, succeeding Maj Gen Orlando C. Troxel, Jr., who retired Mar. 31. At press time no successor had been named for General Britton.

GENERAL BUNKER, credited with an important role in developing the Army helicopter program, served as commanding general, U.S. Army Transportation Command, St. Louis, Mo., from June 1960 to May 1962 before coming to AMC Headquarters. From May 1956 to June 1960, he was CG of the U.S. Army Transportation Supply and Maintenance Command, headquarters at St. Louis, Mo.



Maj Gen William B. Bunker

Earlier key assignments include commandant, Transportation School, Fort Eustis, Va.; assistant chief, Transportation (Army Aviation), Office of the Chief of Transportation; chief, Air Transportation Service Division, OCOF; chief, Railway Transportation Service Division, Office, Chief of Transportation.

Born on Sept. 30, 1910 at Fort Slocum, N.Y., General Bunker graduated from the U.S. Military Academy and was commissioned in the Cavalry in 1934. His father, Col Paul D. Bunker, U.S. Military Academy 1903, was one of the first of West Point's long line of football All-Americans.



Lt Gen Frank S. Besson, Jr.

General Bunker transferred to the Corps of Engineers in 1936 and attended the Massachusetts Institute of Technology. He received an M.S. degree in engineering in 1937 and two years later was graduated from the Officer's Course at the U.S. Army Engineer School.

For the next three years he was in charge of a canal survey in Nicaragua. During World War II, he was the deputy in charge of the Transportation's Corps' supply program—procurement of ships, railway equipment and harbor craft for operation in all theaters of action, marking the beginning of many years in logistics and supply.

Following the war, he was engaged in Army rail and operations work in Europe. When the Berlin Airlift was started in 1948, he was assigned responsibility under Maj Gen William Tunner for gathering shipments and loading aircraft in the U.S. Zone of Germany and unloading and distributing the cargo in Berlin.

Lt Col Anderson Succeeds Lt Col Gay As Redstone Commodity Manager

Lt Col Claude C. Anderson was recently named commodity manager of the Honest John, Little John and Redstone missile systems, to take over the post recently vacated by Lt Col Frank C. Gay.

Col Anderson was assigned to the Missile Command at Redstone Arsenal, Ala., from his latest assignment in Korea, where he served with the U.S. Army Advisory Group.

Formerly assigned to the Army Ordnance Guided Missile School at Redstone (1959-62), he attended the Ordnance Officer's Candidate School at Aberdeen Proving Ground, Md., before receiving his commission in 1942. He served as an enlisted man upon entering the Army in 1941.

Detrick Scientist Assigned to DDRE Chemical Office

Albert E. Hayward, who started his career as an Army scientist in 1943, has been appointed deputy assistant director, Office of Chemical Technology, Office, Director of Defense Research and Engineering, Washington, D.C.

Until he accepted the appointment, he was chief, Program Coordination Office, U.S. Army Biological Laboratories, Fort Detrick, Md. Considered one of the pioneers, he started work at Fort Detrick 21 years ago, in the year the installation was officially activated, and has been in frequent demand as a speaker to groups on the BioLabs historical development.

When released from military service in the grade of captain in January 1947, he became a technical representative with the Biological Science Laboratories, Los Angeles, Calif., but returned in 1950 to Fort Detrick. Starting as chief, Management Branch, he worked his way up progressively through positions as assistant chief, Munitions Division; assistant to the Scientific Director; deputy chief, Program Coordination Office;

and finally chief, Coordination Office.

A native of Las Vegas, N. Mex., with B.A. and M.A. degrees in bacteriology from the University of Texas, he holds membership in the American Society for the Advancement of Sciences, the Operation Research Society of America, the Institute of Management Science and the Research Society of America.



Albert E. Hayward

Maj Gen Meyer Takes Over as Head of STRATCOM

U.S. Army Strategic Communications Command worldwide responsibilities as the Army's newest major command were turned over to Maj Gen Richard J. Meyer on May 1 and Col Wallace M. Lauterbach, former commander, was retained as deputy.

STRATCOM was elevated to its new stature on Mar. 9, 1964, simultaneously with the redesignation of the Chief Signal Officer, a title which had withstood change for 104 years, as the Chief of Communications-Electronics. Col Lauterbach had commanded STRATCOM since July 1963.

General Meyer has been deputy chief of staff, Individual Training, at the U.S. Continental Army Command, Fort Monroe, Va., since June 1962. Previously he commanded the Signal Training Center, Fort Gordon, Ga.

From February 1960 to June 1961 he held a dual role as leader of the Signal Command and as Signal Officer, U.S. Army Europe, following two years duty as commander of Base Section, U.S. Army Communications Zone headquarters in France.

Born Aug. 3, 1910 in Hamburg, N.Y., General Meyer studied civil engineering at Rensselaer Polytechnic Institute before entering the U.S. Military Academy, graduating in 1933. He was commissioned in the Field Artillery and transferred to the Army Air Corps in 1935 and to the Army Signal Corps in 1940.

In 1941 he assumed command of the 57th Signal Battalion and served in

1945, he activated and served as Director, Communications-Electronics Service Test Station of the Army Ground Forces Board No. 1 at Fort Bragg, N.C.

Graduated from the Army War College in 1949, he was assigned to Research and Development Division, Office of the Assistant Chief of Staff, G-4, Logistics, in the Pentagon.

After completing a course at the Industrial College of the Armed Forces, he served in Italy as Deputy Signal Officer, and later in Turkey as CSigO Hq. Allied Land Forces.

Upon his return to the United States in September 1954, General Meyer was designated assistant chief and, later, chief, Research and Development Division, OCSigO.



Maj Gen Richard J. Meyer

2 Missile Command Employees Earn NIPA Awards

Two Army Missile Command personnel at Redstone Arsenal, Ala., are among 45 Civil Service employees selected recently for Career Educational Awards of the National Institute of Public Affairs.

Made under a Ford Foundation grant, the awards permit the winners

a year of graduate study at a leading American university. Selection was made in nationwide competition, with exceptional ability and high potential as the criteria.

Missile Command winners are William V. Black, a special counsel in the Office of the General Counsel, and Miss Helen B. Joiner, the command historian. Mr. Black will attend Harvard University and Miss Joiner will be enrolled at the University of Virginia, working toward additional graduate degrees when they begin classes in September.

Black came to work with the Missile Command in 1959, soon after completing work for his LL.B. degree from the University of Alabama Law School, and graduated from Birmingham Southern College in 1953 with a B.A. degree in English.

Miss Joiner also was graduated from Birmingham Southern where she majored in history and political science. She continued her study at Vanderbilt University and received a master's degree in 1949.

After serving as an instructor in the History Department of Memphis State University for a year, she entered Federal service as an historian at Air Materiel Command Headquarters, Wright-Patterson Air Force Base, Ohio. She returned to her native Alabama in 1954 to accept a position as historical editor at the Air War College, Maxwell AFB.

Miss Joiner came to Redstone in 1956 as chief historian for the Army Ballistic Missile Agency, subsequently serving in that capacity with the Army Ordnance Missile Command and the Army Missile Command.



William V. Black



Helen B. Joiner

Natick Hosts Food Conferees

Military feeding problems and new advances in processing and packaging were reported and discussed at the recent annual meeting of the Food Advisory Committee of the National Security Industrial Association.

About 100 members of the food manufacturing and food service industries gathered at the U.S. Army Natick (Mass.) Laboratories for opening day sessions. Dr. Ferdinand P. Mehrlich, director of the Labs' Food Division, was the principal banquet speaker.

The Natick meeting and a second-day general session in Boston were hosted by representatives of the military services—Rear Adm John W. Crumpacker, chief, Bureau of Supplies and Accounts, Navy; Brig Gen Lawrence F. Loesch, director, Supply and Services, Air Force; and Brig Gen Merrill L. Tribe, commander of the U.S. Army Natick Laboratories, Africa and Italy during World War II. Upon his return to the U.S. in

DoD Begins Second Phase of PERT Cost Orientation Program

The second phase of a Department of Defense orientation program on PERT (Program Evaluation and Review Technique) was announced Apr. 3 to 3,500 defense contractors.

Signed by Assistant Secretary of Defense (Installations and Logistics) Thomas D. Morris, the letter said that the first phase is in process and covers personnel of the Military Services. About 4,000 staff officials in 17 cities will attend a total of 157 orientations of 8-hour duration.

Secretary Morris said the National Security Industrial Association has agreed to organize the second phase for industry. The same Army, Navy and Air Force instructors who have been conducting the military briefings will be made available to the NSIA.

Cities selected and the dates of the briefings are: Dallas, May 7-8; New York City, May 11-12-13; Boston, May 14-15; Detroit, May 11-12-13; San Francisco, May 13; San Diego, May 15; Los Angeles, May 18-19-20. Representatives of major industrial firms in each city have been designated as NSIA points of contact.

"This joint undertaking by Government and Industry to provide PERT Cost Orientation," Secretary Morris' letter said, "is of inestimable value to each. It is very important that Industry and Government communicate in the same terms insofar as

principles, concepts, and scope of application of this modern management technique.

"This is particularly true with the issuance of DoD Directive 3200.9, dated Feb. 26, 1964, on Project Definition Contracts, which requires the use of PERT Cost for all development programs with a value of \$25 million or with an eventual repetitive procurement of \$100 million.

"The 8-hour orientation has been designed to cover the principles of PERT Cost; the management cycle; and to emphasize special features such as the product-oriented work breakdown structure, scheduling and uniform output reports. Provision is made for special discussion on PERT Cost as an aid to incentive contracting; Pre-award use of PERT Cost; and Project Definition Contracts plus a period of general questioning.

"This is not a symposium to encourage top management to adopt a system; this is an orientation to prepare a group of persons in Government and Industry to understand and

communicate with each other in the better use of the system.

"Industry representatives having to do with the procurement process in any way are urged to participate. This should include companies large and small; prime contractors; subcontractors and suppliers; and producers for Defense, AEC, FAA, NASA or other agencies.

"In order that all questions can be answered fully, we are arranging for a member of the PERT Coordinating Group to be present at all sessions. . . . These efforts are very helpful to the objectives of obtaining more effective as well as uniform management systems."

The letter thanked the Army, Navy, Air Force and the National Industrial Security Association for their cooperation in arranging the orientations.

Questions concerning attendance at the NSIA sessions should be directed to R. N. McFarlane, executive director, NSIA, 1107 19th Street, N.W. Washington, D.C. 20036. Telephone Area Code 202, FEderal 8-7474.

Detroit Business District Salutes Army Microbiologist

Dorothy V. McClendon, a microbiologist in the Materials Laboratory of the Army Tank-Automotive Center (ATAC), was selected on Mar. 30 as one of Detroit's "Ten Top" working women.

The metropolitan area competition is sponsored annually by the Central Business District Association of Detroit as part of the national salute to Women Who Work Week, Mar. 29-Apr. 4.

Brig Gen B. J. Leon Hirshorn, ATAC commander, submitted Miss McClendon's name for consideration. A panel of judges selected the winners.

In 1951 she joined the Chemical Section of ATAC's Research and Engineering Directorate as a physical

sciences assistant and was promoted two years later to the Microbiology Section. For the past three years she has been the only microbiologist at the installation and has specialized in fungal deterioration and the cause and effects of microbial attack on military equipment.

In the development of the Redstone, Honest John and Little John missiles and the Jupiter weapon system, she was a major contributor in dealing with the problem of harmful microbial activity.

As a microbiological "trouble-shooter," her services are in great demand among military agencies and private industry as well. Results of her studies have been published in several Government-financed research papers and reports. Currently, she is finishing a report expected to provide answers to the problem of bacteria-clogged jet carburetor filters and fungal sludge deposits in fuel tanks.

Born in Minden, La., she moved with her family to Detroit in 1943. She attended Cass Technical High School, entered Tennessee A&I, Nashville, and was graduated in 1948 with a B.S. degree in biology.

Miss McClendon, 39, is a member of the American Institute of Biological Sciences (A.I.B.S.) and is particularly active in the affairs of the Society for Industrial Microbiology, a subbranch of the A.I.B.S.



Dorothy McClendon

USATRECOM Gets New Commander

Lt Col Michael J. Strok assumed duties last month as the new commanding officer of the U.S. Army Transportation Research Command (USATRECOM), Fort Eustis, Va.

USATRECOM, recently integrated with the Army Aviation Materiel Command, St. Louis, Mo., is responsible for conducting the Army's aeronautical research programs.

A Senior Army Aviator, qualified in both helicopters and fixed wing aircraft, Lt Col Strok has served eight years in assignments in the Office of the Chief of Research and Development and the R&D section of the Chief of Transportation.

Since 1961, he has been assigned as the deputy transportation officer, 1st Logistical Command, France; as commanding officer, 205th Transportation Battalion, Army Aircraft Maintenance, Ludwigsburg, Germany, and the 54th Transportation Battalion at Hanau, Germany, and as chief of the Materiel Branch, Transportation Division, Hq., U.S. Army Europe.

Laser Beams Destroy Tumors in Mice

Extensive experiments with a Laser device designed and developed by U.S. Missile Command scientists have confirmed that certain malignant tumors (cancer) in mice can be destroyed by infrared Laser radiation. Findings are based on several hundred tests.

Dr. John Peter Minton, a surgical investigator on the staff of the National Institute of Health's Cancer Institute, conducted the experiments as part of a continuing study in which industrial Laser specialists have provided valuable assistance. Army Missile Command Laser engineers and researchers joined in the effort.

While results of the animal experiments definitely established the capabilities of certain types of Laser beams on two uniformly fatal tumor strains—the Cloudman S91 Melanoma and the Lewis T241 Sarcoma—Dr. Minton said it is too early to make any correlation with potential treatment of cancer in humans using Laser radiation.

Experiments were conducted under the principles of laboratory animal care promulgated by the National Society for Medical Research. Many of the tumors were destroyed when exposed to a sudden burst of infrared Laser radiation fired at time intervals of thousandths of a second. Tumor implants were made in pure-bred mice, the research team reported.

Dr. Minton said the experiments indicated an apparent relationship between tumor size and the Laser energy dosage required to kill the cancer. Lasers, in his opinion, are excellent energy sources which may be used to destroy many tumor implants rapidly without destroying surrounding tissues. Laser light is emitted in a very narrow and coherent beam, focused to tremendous energy intensities.

A graduate of Ohio State University, Dr. Minton is a commissioned officer in the U.S. Public Health Service, and has worked with industry Laser specialists at Lear Siegler, Ann Arbor, Mich.; Raytheon, Boston, Mass.; and Maser Optics of Boston.

Maj Gen John G. Zierdt, commanding general of the U.S. Army Missile Command at Redstone Arsenal, Ala., said of the cooperative effort:

"The Army spends its research and development money to improve its ability to fight. All of us earnestly hope, however, that some of the discoveries this money underwrites will produce benefits in other forms for



Army Missile Command engineers who participated in development of Laser used in experiments on treatment of cancer in mice include (l. to r.) William Davis, Jr., William B. McKnight and James R. Dearman.

the taxpayers who pick up the bills. This type of research is one that all of us in the Missile Command are proud to assist in any way we can."

Redstone Hosts Tri-Service High Power Laser Meet

Defense application of Lasers was the focal point of discussion at the first quarterly Tri-Service Meeting on High Power Laser Technology, held Apr. 7-8 at Army Missile Command Headquarters, Redstone Arsenal, Ala.

Dr. Chalmers W. Sherwin, deputy director for research and technology, Office of the Director of Defense Research and Engineering, presided at the opening session. John L. McDaniel, technical director, Directorate of Research and Development, Army Missile Command, chaired the second session.

Many of the presentations were classified. Some of the subjects were:

General Systems Considerations, Dr. William H. Culver, Institute for Defense Analyses; Thermal Problems, Dr. Francis T. Byrne, Office of Naval Research; Two Component Gas Laser Systems, Dr. Theodore A. Welton, Oak Ridge National Laboratory; Diffraction Effect in High-Intensity Scattering, Dr. William M. Frank, U.S. Naval Ordnance Laboratory; Status Report of an Advanced High Energy Laser Array, William B. McKnight and William F. Otto, U.S. Army Missile Command.

The Laser device used in the tests has unique energy output capabilities that fitted Dr. Minton's requirements. It was designed and developed in the Applied Physics Branch of the Army Missile Command Electromagnetics Laboratory by a team headed by branch chief William B. McKnight. Army researchers conducted tests simultaneously with Dr. Minton.

The Laser element contains a percentage of neodymium (rare earth element), and was developed for the Army Missile Command, under contract, by the American Optical Co.

William A. Davis, Missile Command Directorate of Research and Development, directed the contract. James R. Dearman, Applied Physics Branch, was project engineer for experiments carried out with the Laser and for support furnished to Dr. Minton.

In testing the Laser device at the Arnold Engineering Development Center, Arnold Air Force Base, near Tullahoma, Tenn., Army researchers are utilizing electrical power sources installed for other Government research programs. Army use of these facilities is the first known adaptation of this type power source for Laser research.

The group toured the power and Laser facilities at Arnold Engineering Development Center, Tullahoma, Tenn.

The program committee was headed by Dr. Robert Watson, chief, Physics and Engineering Branch, Physical Sciences Div., Army Research Office.



Dr. Charles W. Sherwin (left), deputy DDRE (Research and Technology), and John L. McDaniel, technical director, R&D Directorate, Army Missile Command, pause for photo during Tri-Service Meeting on High Power Laser Technology at Redstone Arsenal.

Dr. Archer Takes CORG Special Projects Branch Post

Dr. William L. Archer has been appointed chief of the Special Projects Branch of the Combat Operations Research Group (CORG), an element of the U.S. Army Combat Developments Command.

Associated since 1950 with the Defence Research Board of the Canadian Department of National Defence, he has held varied research assignments, beginning as head of the Rheology Laboratory, Suffield Experimental Station, Ralston, Alberta.

As the Canadian representative with the Operations Research Office of Johns Hopkins University (since replaced by the Research Analysis Corp.) at headquarters of the Far East Command and the Eighth U.S. Army in Korea. With the Army Operational Research Establishment in England, in 1954, he carried out an operations research study of infantry

weapons systems and techniques.

From 1955-57, he served on the staff of the scientific adviser to the Army Council at the War Office in London, specializing in nuclear weapons effects. He returned to Canada in 1957 to head an analytical section of the Operational Research Establishment (CAORE) at Canadian Army headquarters in Ottawa, working on strategic and tactical movement, vehicle systems, nuclear weapons effects, combat surveillance and intelligence and antitank defense.

In 1959 he was appointed as head of the Tactical Studies Wing of CAORE to conduct a program of studies on current and future combat problems pertaining to organization, equipment and tactics.

Dr. Archer served in England, France and Germany with the Canadian Army during World War II as an



Dr. William L. Archer

infantry officer and a staff officer on chemical warfare. In 1945 he served with the British Army as liaison officer for flamethrower research and development in the United States.

Graduated with honors from the University of Western Ontario in 1940, he received a masters degree there in physical chemistry in 1947 and doctorate from McGill University in 1950.

One of the founders of the Canadian Operational Research Society, he also has represented the International Federation of Operational Research Societies.

The Combat Operations Research Group is composed of civilian scientists furnished the CDC under a Department of the Army contract by Technical Operations, Inc. of Burlington, Mass.

CORG functions as a scientific advisory group to CDC in the development of new tactics, weapons systems, organizations, and logistical and support systems.

DoD Sets Technical Info Standards

"Standards for Documentation of Technical Reports under the DoD Scientific and Technical Information Program" is the title of a recently distributed Department of Defense Instruction 3200.8.

Issued to supplement DoD Instruction 5129.43, "Assignment of Functions for the Defense Scientific and Technical Information Program," the new standards simplify and improve document control and cataloging procedures. The instruction applies to all technical reports derived from DoD research and development activities.

Included as an attachment to the standards is a sample copy of DD Form 1473, Document Control Data—R&D, which is required for all technical reports issued on work performed in DoD laboratories and offices.

Army Natick Lab Cartographers Map New Dimensions

Army maps now possess new dimensions—at least those prepared at the U.S. Army Natick (Mass.) Laboratories. Time was when a map was considered good by military men if it indicated clearly geographical locations, distances, contours and prominent terrain features.

Today, maps compiled by the Army Materiel Command's Natick Laboratories show what temperatures to expect (even within an hourly time frame) in almost any location in the world, what clothes to wear, whether vehicle mobility is possible, and how long a person may work efficiently.

Cartographers prepare these specialized maps in conjunction with research conducted by the Polar and Mountain, Desert and Tropic, and General Environments Laboratories of Natick's Earth Sciences Division.

Results of research dealing with environment, geology, vegetation and water sources, for example, are incorporated into special maps using base maps obtained from the Army Map Service and comparable military and civilian cartographic services. The Division is responsible for compiling maps and reports to support Army supply needs around the world.

For military motor convoy commanders, maps are also available to show what ethnic groups may be encountered, languages spoken, solar radiation, food storage and gasoline storage life. Map overlays also indicate timber stands, their height and density, and ridges with the percent of slope, all potential vehicle obstacles.

The specialized maps are frequently

prepared from aerial photographs, projected in three dimensions onto a drawing board where they are transcribed by cartographers.

By identifying geographic areas possessing similar climatic conditions, the new maps are invaluable for the Army's worldwide testing program for materiel and equipment.

Many locations within the territorial limits of the United States duplicate the arctic, tropic and desert conditions found in different parts of the world. Consequently, time consuming and expensive trips to overseas test sites are minimized, saving research dollars and accelerating materiel development.



CLOTHING ALLOWANCE ZONES are plotted on one of the maps prepared by the Natick Labs to indicate supply needs for U.S. troops. Pernel Leuvelink of Brighton, Mass., is the attractive young plotter.

MUST Developmental Team Regards Concept as Epochal Advance

Talk to members of the MUST developmental team and you find it easy to share their belief, as indicated by their zeal, that this new concept in U.S. Army Medical Service to field forces is destined as an epochal advance. Developmental work is under the Office of The Surgeon General.

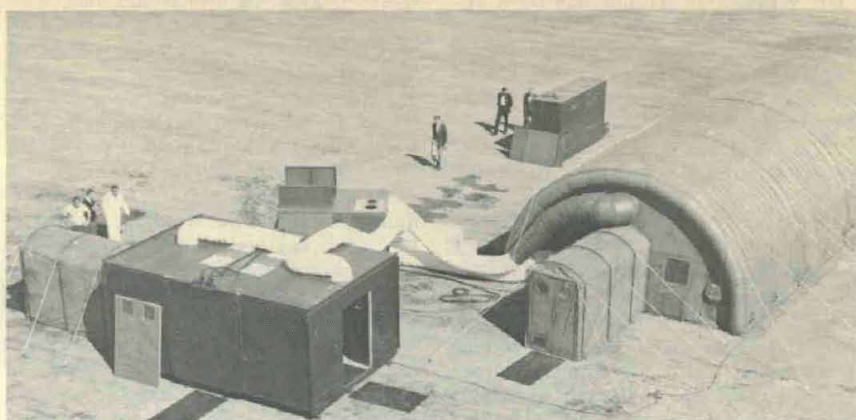
MUST stands for Medical Unit Self-Contained, Transportable—descriptive of characteristics which originators believe will make the system phenomenal in achieving improved patient care while reducing the logistical burden of the field commander.

Conceived to replace existing field medical equipment to support definitive care in forward areas, MUST is intended to be transportable anywhere in the world in a matter of hours for use in any environment.

Moreover, MUST is designed for speedy service wherever it may be unloaded, in that four men can set up an element in 30 minutes. All equipment necessary for operation is to be contained in the original package. Developers contend it will allow maximum use of physicians' and nurses' skills, and increase the mobility of combat medical support forces.

MUST is slated for environmental testing this month at Eglin Air Force Base, Fla., and is still in the developmental phase. The complete complex is not expected to be in the hands of selected Army Medical Service units for testing until about September.

Since the concept is centered on capability of greatly improved patient care under field conditions, a major consideration is precise control of environmental factors in the surgical and ward elements. The survival ratio



of patients in general, and particularly those undergoing major surgery, has been correlated with room temperature.

Basic components of the MUST system are the surgical, ward and utility sections. The expandable surgical element doubles as a shipping container, and will be equipped with modern instruments for performing complex and delicate surgical operations.

The inflatable ward unit is to be equipped to handle 20 casualties. The utility package is to supply electrical power, heating and air conditioning, hot and cold water, and water disposal for patient treatment areas.

While one surgical, ward and utility element can function together as a

medical field unit, MUST also is being designed so that various quantities of basic units can be combined to form a 400-bed evacuation hospital.

A recent in-process review meeting on MUST spelled out the 10 basic development objectives of the program, as follows:

- To increase the capability of field medical units without increasing personnel requirements.
- To improve the mobility of field medical units without additional vehicles.
- To increase the productivity of assigned professional and technical personnel, by providing an environment in which longer hours of work at maximum skill level can be achieved.
- To increase deployment flexibility by assembling the facilities by function.
- To provide an all-weather capacity by equipping the treatment facilities for operation worldwide.
- To reduce supply requirements.
- To achieve a high degree of reliability and dependability in equipment for field medical treatment facilities.
- To provide a CB Collective Protection capability.
- To consider all past and present R&D efforts which will contribute to the program.
- To develop the MUST as a mission-oriented system.

The expandable, panel-type shelter devised for surgical functions will be flexible enough so it also can be suitable for X-ray, materiel and dental services, laboratory or pharmacy.



MUST inflated ward element will have a 20-bed capacity measuring approximately 20 by 50 feet. When deflated, the four sections of the ward, including equipment, are contained in box about 12 x 3½ x 6½ feet.

The yardstick for shipping size of the three MUST elements is the M35 2½-ton truck. This vehicle will carry one surgical element or two equipped ward packages or one utility package.

Elements also will be compact and light enough to be shipped as a trailer with mobilizer running gear, on a cargo plane or by helicopter. The expandable panel type shelter is to weigh about 5,000 pounds equipped, while the ward and utility elements are each to weigh about 3,500 pounds.

Preliminary specifications provide that the surgical unit will measure about 12 by 18 feet when expanded and that the inflated ward, with its 20-bed capacity, will measure about 20 by 50 feet.

Packed in each of the ward and surgical containers will be an air lock to provide a pressurized entry system for the shelter and prevent excessive contamination of interior air. Size of the air lock is to be such that two litter bearers with a casualty on the stretcher may enter.

One requirement under consideration is that first echelon maintenance repairs of the MUST can be performed



IMPROVED PATIENT CARE under field conditions, foremost objective of MUST, is depicted through artist's drawing of operation being performed inside the expandable, completely equipped surgical element.

by hospital personnel with simple tools, to assure smooth operation of the MUST system.

Developer of MUST is the AiResearch Manufacturing Co., a division of Garrett Corp. of Phoenix, Ariz.

DoD Announces Success of Closed Cycle MHD Generator

Successful production of electrical energy by the use of a closed loop generator using ionized gas as its only moving part was revealed Apr. 1 by the Department of Defense.

For the first time, as the culmination of over three years of research effort, it has been demonstrated that significant MHD (magnetohydrody-

namic) power can be obtained at temperatures of 1800 degrees centigrade or below. This compares with the extremely high temperatures of about 3000 degrees centigrade at which open-cycle MHD generators have been successfully operated.

The International Research and Development Co. (IRD), jointly supported by Advanced Research Projects Agency, through the Office of Naval Research, and IRD's parent company, C. A. Parsons and Co., Ltd., have extracted electricity from a closed cycle MHD generator in which the only moving part is high-temperature gas.

The project is a part of ARPA's program of research on the production of energy by other than chemical means. Ultimate use of this type generator is envisioned for large power plants.

The IRD closed cycle MHD generator operates with a mixture of pure helium and cesium. In these initial experiments the equipment was operated continuously for 15 hours with gas temperatures to 1800 degrees C.

Twenty separate tests were made, with varying temperatures, cesium content and applied magnetic field, with maximum power output of ½ watt. It is believed possible that even with the present small size generator duct a power output as high as three kilowatts can be obtained.

The new generator was developed at IRD's plant in England.

President Backs Pay Raise For Federal Employees, Asks Adherence to 3 Principles

Passage of Federal pay raise legislation was listed as one of five remaining "must" objectives of President Johnson during the current session in an April message to Congress. But the Chief Executive's budget message, stressing economy effort, stated:

"I call upon all Government employees to observe three paramount principles of public service:

"First, complete fairness in the administration of governmental powers and services;

"Second, scrupulous avoidance of conflicts of interest; and

"Third, a passion for efficiency and economy in every aspect of Government operations.

"For its part, the Federal Government must be a good employer. It must offer challenging opportunities to its employees. It must be prompt to recognize and reward initiative. It must pay well to attract and keep its share of dedicated and resourceful workers. It must welcome fresh ideas, new approaches, and responsible criticism.

"For 33 years I have been in Government service. I have known its challenge, its rewards, and its opportunities. But all these will multiply in the years to come. The time is at hand to develop the Federal service into the finest instrument of public good that our will and ingenuity can forge."

British Royal Signals Blare Praise of Army Signal Corps

Friendship and cooperation between the British Royal Signals and the U.S. Army Signal Corps, dating back more than a century to the establishment of the latter in 1860, were warmly signaled recently in England.

The occasion was a visit of Maj Gen David P. Gibbs, recently appointed chief of Communications-Electronics, U.S. Army, for a tour of Royal Signal installations as the guest of Maj Gen F. J. Swainson, O.B.E., British Signal Officer-in-Chief.

When they reached the Training Brigade Royal Signals in Yorkshire, the Fanfare Trumpeters Royal Signals Band played a new composition, "The Blue and the Grey," written in honor of and dedicated to the U.S. Army Signal Corps. A bound copy of the composition, presented to General Gibbs will become a permanent exhibit at the U.S. Army Signal Corps Museum, Fort Monmouth, N.J.

25 Defense Agencies Share In AMC Long-Range Planning

A classified meeting on Army Materiel Command Long-Range Technical Planning recently drew about 50 scientists and engineers representing 25 defense agencies to Washington.

Held at Harry Diamond Laboratories (HDL), the session emphasized progress in defining applied research tasks which support successful development of weapons and carrier systems, communications and electrical-optical systems, and personnel support of a combat assault mobility device for the future.

AMC officials called the meeting of great significance to personnel interested in long-range technical planning.

HDL is an Army Materiel Command installation assigned the mission of providing supporting research and development of weapons components, particularly proximity fuzes and electronic timers, and is well known for significant contributions.

Lincoln Named for 3rd Star as Colglazier Successor

Lt Gen Robert W. Colglazier, U.S. Army Deputy Chief of Staff for Logistics, has been appointed to succeed Lt Gen Carl Henry Jark, who will retire Aug. 1, as commanding general, Fourth Army.

The White House also announced early in April that Maj Gen Lawrence J. Lincoln has been nominated for lieutenant general and will succeed General Colglazier as DCSLOG.

Presently deputy CG of the U.S. Army Ryukyu Islands IX Corps at Fort Buckner, Okinawa, General Lincoln was CG, U.S. Army Engineer School, Fort Belvoir, Va., from June 1962 to March 1963.

Prior to that assignment he was Assistant Deputy Chief of Staff for Logistics for one year and director, Plans and Materiel, Office, Deputy Chief of Staff for Logistics, September 1958 to May 1961, after having served for several months as deputy director, Plans and Materiel.

Born near Harbor Beach, Mich., in 1909, General Lincoln was graduated from the U.S. Military Academy in 1933. Commissioned in the Corps of Engineers, he served in Denver, Colo., and Hawaii, received a degree in civil engineering from Princeton University in 1937 and graduated from the U.S. Army Engineer School in 1938. From 1938 to 1942 he was an instructor in military art and engineering at the U.S. Military Academy.

During World War II, General

Lincoln served two tours of duty in the Operations Division, War Department, receiving the Distinguished Service Medal for service as chief of the Asiatic Theater Section. Overseas, he served as executive officer to General Wedemeyer on the staff of Lord Louis Mountbatten in the Southeast Asia Command.

Following World War II, General Lincoln served nine months as one of five U.S. Commissioners on the Joint U.S.-Soviet Commission in Korea. In the fall of 1947, he became Deputy Chief of Staff of Joint Task Force Seven, which conducted the Pacific atomic tests in 1948, and that same year was named engineer for U.S. Army, Pacific.

The great flood of July 1951 on the Kansas and lower Missouri Rivers occurred during his 3-year tour as Kansas City district engineer. While deeply involved in flood control and other civil works activity, the District also carried out a major military construction program in Kansas and Missouri on air bases and Army facilities.

In 1954 General Lincoln was ap-



Maj Gen Lawrence J. Lincoln

pointed engineer for Headquarters, Fourth Army, Fort Sam Houston, Tex., and subsequently became Deputy Chief of Staff for Operations.

In May 1956, he was assigned as engineer of the Mediterranean Division, Corps of Engineers in Morocco, and moved the Division Office to Leghorn, Italy, in November 1957. During two years in the Division, he was responsible for major engineering and construction of all types of facilities in nine countries.

NIH Picks Army Scientist as Public Health Adviser

The National Institutes of Health have recognized the professional achievements of a U.S. Army Research Office staff scientist by inviting him to serve as a special consultant to the U.S. Public Health Service.

Dr. C. Jelleff Carr, chief of the Scientific Analysis Branch, Life Sciences Division, will begin a 4-year term July 1 as a member of the NIH Pharmacology Training Committee, which meets three times a year.

Committee members advise the National Advisory General Medical Sciences Council of the NIH and The Surgeon General of the Public Health Service. Functions include the review of applications for training grants and the survey of the status of training in their respective fields to determine areas in which research training should be initiated or expanded.

Dr. Carr's advice may be requested by the Council or directly by the Public Health Service on other matters relating to grants and award programs to provide adequately trained manpower.

Training in clinical pharmacology, which the committee administers, is designed to produce pharmacologists who will investigate and relate the action of drugs in humans and animals.

Training grant support is offered at the pre- and postdoctoral levels. Prerequisites are a thorough grounding in chemistry, biochemistry and physiology, with a working knowledge of anatomy and embryology as well as some acquaintance with mathematics and physics.

Col Riordan Becomes Deputy Commander of Natick Labs

Col Clifford T. Riordan has been named deputy commander of the U.S. Army Natick (Mass.) Laboratories after serving since August 1963 as Natick deputy post commander.

Until the Armed Forces Food and Container Institute in Chicago was deactivated Aug. 31, and its research and development of military foods and rations transferred to Natick, he commanded the AFFCI.

A 1938 graduate of the United States Military Academy at West Point, the Command and General Staff School, and the U.S. Army War College, he received his M.B.A. in business administration from University of Alabama in 1950.

Col Riordan was Quartermaster instructor for the Illinois National Guard, Chicago, from 1947-1949, and then was assigned to the Quartermaster Section, Headquarters Eighth Army, Korea; and the Quartermaster Section, Far East Command (Japan). Subsequently he served three years as Plans and Programs Office Chief, Office of the Quartermaster General, later commanded the 2nd QM Group, and activated the 6th QM Group.

During 1942-1947 he served successively as Assistant and Force Quartermaster, Amphibious Forces, Atlantic Fleet, Norfolk, Va.; Executive Officer, 23rd QM Group, Fort Jackson, S.C.; activated the 143rd QM Battalion, Camp Campbell, Ky.; Division QM, 71st Division, European Theater of Operations; assistant QM officer, Headquarters, Third Army, Europe.



Col Clifford T. Riordan

Army Contract Awards Total \$145 Million

U.S. Army contract awards in recent weeks totaled about \$145 million, roughly \$122 million less than the previous 4-week total as reported in the April issue.

Four contracts for classified ammunition, total \$23,885,554, awarded by the U.S. Army Ammunition Procurement Supply Agency, Joliet, Ill., were shared by: Amron Corp., Waukesha, Wis., \$9,303,122; Minneapolis-Honeywell Regulator Co., Hopkins, Minn., \$8,961,505; AVCO Corp., Richmond, Ind., \$2,950,506; Aerojet General Corp., Downey, Calif., \$2,670,421.

General Motors Corp., Pontiac, Mich., will produce bus-type vehicles for \$11,649,099. Olin Mathieson Chemical Corp., New York City, was awarded a \$9,589,841 contract for production of miscellaneous propellants and charges.

Holston Defense Corp., a division of Eastman Kodak Co., Rochester, N.Y., was awarded a \$7,728,352 contract modification for production of explosives. Raytheon Co., Lexington, Mass., received contracts totaling \$6,432,300 to continue development of the Hawk guided missile guidance and control system.

IBM Corp., Washington, D.C., won a \$6 million contract, renewing rental of computers at Army installations worldwide. Model Engineering and Manufacturing Corp., Huntingdon, Ind., received a \$5,993,734 initial increment to produce radio sets over two years.

Regents of the University of Wisconsin, Madison, Wis., received a \$5,576,000 cost reimbursement contract for operation of the Mathematics Research Center, U.S. Army.

Ling-Temco-Vought, Inc., will produce classified electronics equipment for \$5 million. General Dynamics Corp., Pomona, Calif., will get \$4,759,284 to continue research and development of the Redeye missile system, even though initial production of Redeye has begun, and the Mauler weapon system for \$2 million.

Harvey Aluminum Sales, Inc., Torrance, Calif., received a \$4,624,759 contract modification for production of 40 mm. and 105 mm. ammunition and components. Magnavox Co., Fort Wayne, Ind., was granted a \$4,441,667 contract modification to produce radio receivers and transmitters. Hercules Powder Co., Wilmington, Del., was awarded a \$3,905,488 modification for loading and packing of missile components and for miscellaneous propellants and explosives.

Aircraft Radio Corp., Boonton, N.J., was awarded a \$3,564,543 contract for production of AN/ARN-30E radio receiving sets and AN/ARN-59 direction finding sets. Chamberlain Corp., Scranton, Pa., received a \$3,406,250 modification to produce projectile parts.

Sylvania Electric Products Inc., received a \$3,300,000 contract for research and development in the electronic warfare field. Firestone Tire and Rubber Co., Akron, Ohio, was granted contracts totaling \$3,234,019 to produce disk assemblies with tires for M48 and M88 tanks and rubber track shoe assemblies for M51 and M88 tank recovery vehicles.

Stanford Research Institute, Menlo Park, Calif., received a \$2,511,400 contract for research studies on the dissemination of solid and liquid agents.

Shawnee Industries, Inc., Shawnee, Okla., will fabricate and install an altitude simulation system at the Lunar Excursion Module Test Facilities at White Sands Missile Range for \$2,401,076. Bell Helicopter Co. will produce additional UH-1B aircraft for \$2,388,629.

Olin Mathieson Chemical Corp., East Alton, Ill., was awarded a \$2,309,139 contract for production of ammunition and Stromberg Carlson Division of General Dynamics Corp., Rochester, N.Y., received a \$1,850,000 modification to produce six special purpose manually operated control desks as part of a switching system.

Lesser contracts were: Pacific Car and Foundry Co., Renton, Wash., \$1,654,425, engineering services for 175 mm. gun, M100 Howitzer and the

M578 recovering vehicle; Ingraham Co., Bristol, Conn., \$1,550,989 for production of booster metal parts; Magnavox Co., Urbana, Ill., \$1,450,684 to produce 66 gun direction computers, M18, with equipment; AVCO, Lycoming Division, Williamsport, Pa., \$1,386,762 to produce 303 engine assemblies for OH-236 aircraft;

Aerojet General Corp., Sacramento, Calif., \$1,380,000 for research and development on Sprint and a Class II composite propellants for Nike X; University of Illinois, Urbana, Ill., \$1,266,667 cost-reimbursement for applied science research study on all-weather attack systems; Raytheon Co., North Dighton, Mass., \$1,218,500, maintenance of modification kits; General Electric Co., Burlington, Vt., \$1.2 million for product improvement, design and development of 20 mm. M61A1 Vulcan Gun Pod with accessories and tooling;

Allis Chalmers Manufacturing Co., Tulsa, Okla., \$1,193,910 for design, manufacturing, delivery installation and testing of two kv.-a. generators; General Motors Corp., GM Defense Labs, Goleta, Calif., \$1,177,710 modification to continue study of recovery of a vehicle from outer space (Hyper Velocity Range Research Program); Martin-Marietta Corp., Orlando, Fla., \$1,161,864 for Pershing missile system modification kits; Allison Division, General Motors Corp., \$1,103,022 for transmissions for various types of personnel carriers; Union Carbide Corp., New York City, \$1,019,472 for 304,320 dry batteries to be used in tactical radio sets; Freuhauf Corp., Fullerton, Calif., \$1,019,167 for 33 Sergeant ground support vehicles; Burroughs Corp., Detroit, Mich., \$1 million modification to classified electronics equipment production contract.

CIDS Coding Progresses Under WRAIR Contract

Coding procedures for use of the Army Chemical Typewriter (ACT) in the Chemical Information Data System (CIDS) have progressed greatly at Walter Reed Army Institute of Research through results of a contract.

"In my opinion the chief investigators of Colgate-Palmolive Co., Dr. David Gould, Edward Gasser and Robert Gregory, have made a very significant contribution to the handling of chemical information, especially in the area of question formulation." So stated Dr. David Jacobus, chief of the WRAIR team which developed ACT from a concept advanced by Alfred Feldman.

Based upon three years of research on a manual coding system, the con-

tractor was given the task of improving the system that was being used for ACT. The result is a system that permits atom by atom coding and a search across unknown or unspecified atoms or bonds, and compounds having only a partially known component.

The contractor has developed a 19-step program to decode the ACT input into a list of atoms and their bond connections, Dr. Jacobus explained. The delivery date for completion of this phase of the contract is June 30. The overall system test is set May 15.

The experimental system at Colgate system uses a CDC-160A computer. Manual input into the program can process about 60,000 chemical codes an hour, including generic searches, Dr. Jacobus said.

Army Aerial Vehicle Development Spurred by Mobility Goals

By Colonel John Dibble, Jr.

For several years it has been apparent that if the Army is to break loose from the restraints which the terrain imposes upon ground movements, it must move through the air. This train of thought was recognized in the organization of the ROAD Divisions which added an air mobile company for rapid movement of up to an infantry company in a single lift.

The Secretary of Defense later directed the Army to reexamine its use of aerial vehicles and determine the maximum degree to which they could substitute for ground vehicles. His directive resulted in the recommendations of the Howze Board—proposals that are now being tested as an Army air mobility concept. This concept is being tested with the aerial vehicles in the Army's current inventory.

As the newer models gradually become available in sufficient quantities to fill the Army's needs, it will become clear that only six basic categories of tactical aerial vehicles are involved in the development program. Army aircraft in these six categories are the type that contribute most if they stay with and under the control of the Department of the Army.

Aerial vehicles used by the Army must either have the best available short takeoff and landing capabilities, or preferably, they should have a vertical takeoff and landing capability. In addition, they must be rugged and simple enough and sufficiently flexible that the advantages they offer are worth their cost in meeting peculiarly exacting Army mobility requirements.

The current state-of-the-art requires us to have a mixture of short takeoff and landing (STOL) and vertical and short takeoff and landing



XV-4A Hummingbird

(V/STOL) aircraft. Ultimately, the ideal aircraft should combine the hovering, low speed, agility, and low downwash characteristics of helicopters with the speed, maneuverability, and efficiency of fixed wing aircraft.

The research and development problem is to provide this optimum V/STOL aircraft at a price, and with the simplicity, maintainability and relatively low-fuel consumption, that will permit the Army to afford it and support it. It is appropriate, therefore, to review the status of our present inventory of aircraft to provide a framework from which to proceed into discussion of the new programs aimed toward this highly desirable airplane of the future.

The first category is the light observation aircraft, currently represented by the L-19 Bird Dog airplane, and the Sioux and the Raven helicopters. To replace these air vehicles, three competing models of light observation helicopters (LOH) are being evaluated at Fort Rucker, Ala., and at Edwards Air Force Base, Calif. Evaluation will be completed this summer.

The 4-place LOH will have a cruising speed of approximately 110 knots

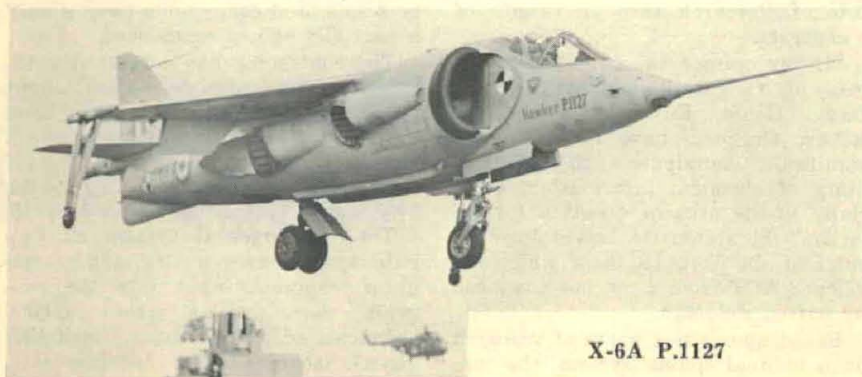
and be powered by a 250-horsepower turbine engine. Incidentally, one of the objectives of the development program is to employ turbine engines in all Army aerial vehicles to take advantage of the rapidly improving efficiency of the turbines and to permit the use of a common fuel.

The next category, the Surveillance Aircraft System, is represented by the Mohawk. In the inventory since 1961, it will probably be replaced by a V/STOL aircraft which will free it from dependence on the field strips that currently restrict some Mohawk operations. Further, the V/STOL aircraft will provide an improved in-flight survivability in future combat environments due to its higher speeds.

Three test bed programs are in progress. First, and probably most widely publicized, is the P.1127 Hawker-Siddeley. This is a tripartite program participated in by Great Britain, Germany and the United States. The Army is the United States program manager for the project and supplies 50 percent of the U.S. funds.

Utilizing four nozzles which, when deflected vertically, provide for vertical flight, the P.1127 made its first transition flight in the fall of 1961. Operational evaluation, conducted by the three participating countries, is expected to be concluded in 1965.

The second test bed is the U.S. Army-developed Lockheed Hummingbird. Powered by two 3,300-pound thrust engines, it uses the augmented jet principle for vertical lift. Exhaust gases from the jet engines are deflected downward for vertical flight and their thrust is augmented a theoretical 1.4 times by the additional flow of cool ambient air which is drawn into openings at the top of the



X-6A P.1127

fuselage. The Hummingbird hovered in the spring of 1963 and transitioned from the hover to conventional flight last fall.

The third air vehicle in this surveillance system program is the Fan-in-Wing, an Army development being produced jointly by General Electric Co. and Ryan Aircraft Corp. Powered by two 2,650-pound thrust engines, it gets its drive for vertical flight from three lift fans. Two are mounted in the wings and a smaller fan is mounted in the nose. Gases from the engines strike their tips and produce a 3-fold augmentation of the engines' thrust for vertical flight.

The first Fan-in-Wing aircraft was delivered to the Army test facility at Edwards Air Force Base in February and had its initial brief lift-off on Mar. 31.

These three test beds will provide the engineering data and operational experience from which the Army seeks to develop the new surveillance system to replace the Mohawk. This V/STOL airplane is expected to become operational in the early 1970s.

The next class of aircraft under Army development is the Weapons Aircraft System for which the Army's official term is now the Advanced Aerial Fire Support System. Although no current aircraft is specifically designated as an Advanced Aerial Fire Support System, suppressive armaments have been installed in many of our current helicopters. The most widely used and successful is the UH-1B, powered by a 1,100-horsepower turbine engine and capable of 90 to 110 knots.

With normal product improvement, the UH-1B will fill our requirement for a weapons aircraft until 1969. By then it is anticipated that a V/STOL aircraft, perhaps a compound helicopter, will have been developed as a complete weapons system.



XV-5A Fan-in-Wing

The compound helicopter differs from the simple helicopter by having its high speed partially provided by the lift of a wing, as well as the forward jet thrust, a propeller, or a combination of both. It is anticipated that by 1970 it will be possible to build a compound helicopter with a speed of 220 knots or greater.

The systems approach of developing the fire support capability as a system, rather than developing the aircraft separately and then adding on the armament, the avionics, and the other communications and navigational equipment required, is one which the Army seeks to apply to all future aircraft developments.

The next three classes of aircraft in the Army program are the Utility/Tactical Transport Aircraft System, the Light Tactical Transport System, and the Heavy Lift Aircraft System. All are designed to provide the transportation that has long been associated with ¼-ton jeeps, 2½-ton trucks, heavy trucks, and other ground vehicles.

The Utility/Tactical Transport System currently consists of the H-19s, the H-34s, the H-21s, and the newer UH-1Bs and UH-1Ds. Another term for this type of aircraft is a squad carrier. The UH-1Ds were adopted as standard Army vehicles in

September 1962 and are expected to have a long life extending into the mid-1970s. By that time, it should be possible to determine whether the V/STOL or the compound helicopter will provide the best replacement for this type of aircraft.

Similarly, it should be possible to determine whether the V/STOL or the compound helicopter will replace the CH-47 Chinooks and the CV-2 Caribous that currently provide our Light Tactical Transport System. The Army is engaged in a Tri-Service V/STOL evaluation to provide a possible replacement for either the Utility/Tactical Transport or the Light Tactical Transport.

The XC-142, being built by Ling-Temco-Vought in cooperation with Ryan Aircraft Corp. and Hiller Aircraft Corp., is a full-scale, 4-ton, test bed intended to undergo operational evaluation with a view to its first flight late this year. Employing a tilt-wing principle and powered by four T-64 General Electric engines, each rated at 2,850 horsepower, this type of aircraft has a maximum estimated speed of about 350 knots.

The second effort in this program is the X-19, a half-scale test bed with a payload of about 1,200 pounds. Built by Curtiss-Wright, it made its initial flight test last fall. Employing a tilt-propeller design concept utilizing revolutionary broad-chord, high-density, fiberglass propellers, it is powered by two T-55 Lycoming engines, each rated at 2,200 horsepower and cross-shafted to permit operation on one engine.

The third test bed in this program is the X-22, being developed by the Bell Aerospace Co. Employing a ducted propeller system, it is also a half-scale test bed, powered by four T-58 General Electric engines, each rated at 1,250 horsepower. The first

(Continued on page 35)



XC-142 Tri-Service VTOL

Army Weapons Command Hosts Army Operations Research Symposium

The third annual U.S. Army Operations Research Symposium at Rock Island (Ill.) Arsenal, May 25-27, will involve top experts in the Department of Defense, industry and universities among more than 300 participants. Several Free World nations are expected to send representatives.

Lt Gen Charles H. Bonesteel, III, director of Special Studies and special assistant to the Army Chief of Staff, is the keynote speaker. Dr. Alex M. Mood, president, Operations Research Society of America, and Dr. William A. Niskanen, Jr., director of Special Studies, Department of Defense, are on the agenda for luncheon addresses.

Director of Army Research Brig Gen Walter E. Lotz, Jr., will open the symposium and introduce General Bonesteel. Remarks of welcome will be given by Brig Gen Roland B. Anderson, commander of the Army Weapons Command, host installation.

Two panel discussions will feature the program and 40 technical papers, most of them authored by Army personnel, have been selected for presen-



Lt Gen Charles H. Bonesteel



Brig Gen Roland B. Anderson

tation, the largest number since the symposium was initiated. The planning committee regards the increase as indicative of the rapid growth of interest in operations research in the United States and in foreign countries as an advancing science applicable to military plans and activities.

Dr. Edwin W. Paxson of Rand Corp. will be chairman of a panel on "Net-

work Techniques," including Dr. Lester R. Ford, CEIR Inc.; Dr. Norman Dalkey, Rand Corp.; James E. Kelley, Jr., Auerbach Corp.; J. W. Pocock, Booz-Allen Applied Research, Inc.; Lawrence J. Fogel, General Dynamics/Astronautics; and C. E. Clark, System Development Corp.

Maj Gen William P. Yarbrough, commanding general of the U.S. Special Warfare Center, Fort Bragg, N.C., and Dr. Hugh Cole, Research Analysis Corp., are programed as cochairmen of a panel on "Special Warfare." Emphasis will be on counterinsurgency operations and the panel will include representatives of several countries known for success in this type of operation.

Dr. Robert M. Thrall, professor of mathematics and operations research, University of Michigan will continue in the role he has filled at the two previous symposiums—that of summarizing and presenting a critique of the three days of discussion.

In addition to emphasizing the importance of operations research to the solution of high priority Army problems, the agenda is designed to stimulate an exchange of viewpoints by recognized leaders on gains in methodology, to report on key operations research projects, and to reflect the Army's in-house laboratory or contract agency capability in this field.

Dr. George E. Nicholson, head of the Department of Statistics at the University of North Carolina, is general chairman of the symposium. Chairman of the planning committee is Oscar M. Wells, U.S. Army Weapons Command, Rock Island, Ill. The Operations Research Technical Assistance Group assisting with arrangements is headed by Col Nils M. Bengtson, commander of the U.S. Army Research Office-Durham (N.C.).

U.S. Army Research Office Adds 2 to Physical Sciences Staff

New personnel assigned recently to the Physical Sciences Division, U.S. Army Research Office, Arlington, Va., include scientists Robert J. Heaston and Charles S. Porter. An organic chemist, Heaston is in the Chemistry and Materials Branch. He will be responsible for staff programing and coordination of Army-wide research programs on propellants, explosives, pyrotechnics, fuels, lubricants, organic materials and protective clothing.

Previously he was an aerospace engineer (propulsion and power) with the Advanced Research Projects Agency, Office of the Secretary of Defense (1961-64) and senior project engineer for technical administration of Air Force programs on synthesis and combustion evaluation of special fuels (1955-58). He served in the U.S. Air Force from 1953 to 1955 as a project engineer in research and development of special fuels.

Mr. Heaston received a B.S. degree with honors in 1952, an M.S. in chemical engineering in 1954, and expects to receive a Ph.D. in the same field in June 1964. He is the author of many technical articles in the fuels and propellants field.

MR. PORTER, now a solid-state physicist in the Physics and Engineering Branch, was until recently a leader of an Applied Laser Group at Harry Diamond Laboratories, Washington, D.C. He came to HDL in 1952, when the facility was under the National Bureau of Standards. Beginning as a physical chemist, he moved into solid-state physics and concentrated on Laser research and development.

Author or coauthor of more than 30 articles on Laser technology, he is a 1948 graduate of Baylor University with a B.S. degree in chemistry. He was a graduate assistant in physical chemistry at Purdue University for two years and served in the U.S. Army before beginning Federal employment.



Robert J. Heaston



Charles S. Porter

COBOL Compiler Simplifies Computer Programing

"So simple a child can do it" is the advertising blandishment that has led to the downfall of many a do-it-yourselfer—which does not deter the Army Materiel Command from thinking that way about the COBOL Compiler.

Acquired recently as an aid to expedite the use of computers in the battlefield, the Compiler is the first of its type developed for Army tactical unit use. Linked to the Command Con-

trol Information System-1970 (CCIS-70), the Compiler is saving time and money at a MOBIDIC (Mobile Digital Computer) installation in Europe.

COBOL means Common Business Oriented Language. Consisting of a basic English vocabulary and a set of grammatical rules governing its use, the system was developed by the Department of Defense in coordination with representatives of a number of data processing firms.

With COBOL, coding is keyed to the level of the average businessman, scientist or engineer who needs computer help on a problem. The Compiler presents instructions and data on a reel of magnetic tape, which tells the computer how to prepare the detailed series of steps needed to solve a problem, including transposition into the complicated code required.

The normally difficult programing function—accounting for the statement that the most sophisticated computer is no better than its programmer—is simplified to the extreme by COBOL. That, at least, is the claim of the CCIS-70 project manager's office at the U.S. Army Materiel Command installation at Fort Belvoir, Va.

The average person, it was stated, can "easily write a set of instructions for a computer in COBOL." Further, it is claimed that COBOL reduces by about one-fourth the number of highly trained programmers needed.

Considering that under the normal programing procedure, in which a very slight error in selection of steps necessary to solve a problem (or an error in translating instructions from English into computer code) will cause the computer to stop or to give a

wrong answer, COBOL appears to be long step forward.

A computer equipped with the COBOL Compiler can use any instructions written in COBOL, even though they were written for another make computer, provided that the second computer's compiler is constructed on approximately the same scale and has about the same capabilities.

Since the coder is less likely to make mistakes when using the simplified COBOL code, substantial savings are effected by reduction of programing errors, as well as time and cost savings in preparation and checking. The coder does not need detailed knowledge of the computer to write instructions in computer code.

The COBOL Compiler was designed and developed by Sylvania Electronic Systems under the technical direction of the U.S. Army Electronics Research and Development Laboratories at Fort Monmouth, N.J.

Redstone Hosts Executive Meet

Speakers from universities, industry, Government and private organizations discussed management problems at the first executive seminar for scientists and engineers ever conducted at Redstone Arsenal, Ala., Apr. 13, with 40 key officials present.

Designed to give managers in the scientific and technical fields an opportunity to explore new and significant ideas bearing upon scientific groups within the Government, the seminar was coordinated by Joseph R. Martin of the Atlanta Region of the Civil Service Commission. Scientists and engineers from the Army Missile Command and the Marshall Space Flight Center participated.

Conference Stresses Need For Computer Development

Expanding the capabilities of the Army's field artillery digital automatic computer (FADAC) was stressed at the Second FADAC Management Conference, Apr. 1-2 at Fort Belvoir, Va.

"The FADAC is the only automation device of its kind accepted by the Army to the point of issue to troops," stated Col Anderson Q. Smith, CCIS-70 project manager. "It is a part of the CCIS-70 Project effort to provide effective automation equipment and systems to the field commander as a tool for applying his command and control procedures to ever-increasing, modern battlefield requirements."

The conference was hosted by the CCIS-70 Project Production and Distribution Division, with its chief, Raymond E. Custer, as chairman. Representatives attended from Department of the Army Office of the Chief of Staff for Force Development, U.S. Continental Army Command, U.S. Army Materiel Command, U.S. Combat Developments Command, Hq. Marine Corps, U.S. Army Munitions Command, U.S. Army Test and Evaluation Command, U.S. Army Mobility Command, U.S. Army War College, U.S. Army Weapons Command, and Geodesy, Intelligence and Mapping Research and Development Agency. CCIS-70 Project personnel from Fort Belvoir, Fort Huachuca, Fort Monmouth, and Frankford Arsenal also participated.

Developers and users of the FADAC aired their problems, received recommendations for solving them, and identified courses of action which would expedite equipping troops with the FACAC computer system as a step toward supporting the Army's advancing battle techniques.

"As the production schedule now stands," Mr. Custer said, "we should be able to begin issue of a limited number of FADAC units in May."



Col Anderson Q. Smith, the manager of the U.S. Army Materiel Command's CCIS-1970 project, holding role of magnetic tape for COBOL, points out MOBIDIC installations in Europe where compiler is being used to Col Jack F. Diggs, CO, U.S. Army Combat Development Command's CCIS Group.

Air Defense Board Service Tests Gun Materiel, Missile System

The Air Defense Board at Fort Bliss, Tex., is the U.S. Army Test and Evaluation Command unit responsible for service testing air defense systems.

The Board's Missile Systems Test Division has a mission which includes evaluation of air defense gun materiel and compact forward area weapons, such as, for example, the new Redeye air defense missile, in addition to the larger more sophisticated type guided missile systems.

Redeye is considered by the Board as a typical example of the teamwork required to complete a realistic program of testing, and achieve the desired result. The Engineer/Service test team must continue to monitor, analyze and plan all aspects of the program, although there may be unpredictable delays, in order to phase smoothly into the evaluation cycle.

Basically, the engineer test team, from the Air Materiel Test Evaluation at White Sands (N. Mex.) Missile Range analyzes a system from a different point of view than that of the ADB service test agency. Engineering test findings inform all concerned of the technical capabilities and limitations of an item under test. It then becomes the responsibility of the service test team to evaluate development and engineering data, combine those results with that of the field test analysis, and compile an informative report.

One of the means to implement effective exchange of information among all testing agencies is to form a program committee, such as the Technical Coordinating Committee for Redeye testing. Members are representatives of the developing agency and the engineer/service test team of the Test and Evaluation Command, and the committee meets quarterly to review, update and plan procedures.

When the test officer begins initial planning upon receipt of a test directive from higher headquarters, questions begin to run through his mind. Is the range usable and available? Will the instrumentation and support facilities be adequate? Are the personnel on hand trained to do the job? When will the materiel be available for test? What is the status of development?

The test officer has one definite advantage in that Air Defense Board personnel have a long history in the field of service testing, and facilities are adequate to evaluate forward area gun and missile systems. En-

vironmental and airborne testing requires assistance from other Test and Evaluation Command units.

Bearing this in mind, the test officer coordinates with the organic support division for instrumentation and data reduction requirements in executing his plan. Liaison visits to the developer and contractor for background information are a must.

A close relationship is established with the engineer test agency to keep current on technical development. Information on the availability of hardware and necessary funds must be provided in order to request accurate support and material requirements. This is the largest headache peculiar to service testing. Program delays, materiel changes, money problems, and delivery schedules make accurate forecasting a problem.

Personnel to support field testing at the Air Defense Board are furnished by the Air Defense Center, Fort Bliss, Tex. Dependent on the complexity of the system, these operator type personnel are school trained or troop trained, as the need requires.

After delivery of the item for test, the firing phase of the program begins as quickly as possible. The firing site is located approximately 25 miles north of Fort Bliss. Instrumentation used includes Contraves theodolites,

telemetry equipment and scoring devices. Timely transmission of data is accomplished by microwave to the Air Defense Board computer at Fort Bliss. This provides an early readout to the data reduction section.

One of the remaining target detachments in the Army is an organic part of the Board. Although limited in capability, the detachment, aided by contractor supported flights, provides the missile test division with target support.

Periodic reports are published to keep those concerned up to date on the progress of the test. Compilation of data provided by any USATECOM unit participating in the service test is analyzed and incorporated in the final report of test.

29-Ton Magnet Set for Nike X

An 8-sided permanent magnet, weighing 29 tons (the largest ever built in the U.S.), is being readied for installation at the Army Nike X ICBM defense system test site at White Sands Missile Range, N. Mex.

The magnet will be part of the focusing structure for the Nike X System's Multi-function Array Radar (MAR), now being constructed to perform target acquisition, tracking and discrimination.

Danish Engineer Joins U.S. Army Natick Labs

Danish Atomic Energy Commission chemical engineer Niels W. Holm is working as a visiting scientist at the U.S. Army Materiel Command's Natick (Mass.) Laboratories, under a one-year National Academy of Sciences associateship.

The project on which he is engaged is concerned with standardizing dose measurements for Natick's 24-MEV, 18-kilowatt linear accelerator. The accelerator and a 1.3 million curies of cobalt 60 source are used in the Army's continuing study of food preservation by ionizing energy.

A chemistry and chemical engineer graduate of Copenhagen's Technical University, and a member of the Danish Engineers Association (Dansk Ingeniørforening), Mr. Holm is investigating areas of chemical dosimetry, particularly with oxalic acid as a method of measurement. Chemical substances are changed by exposure to ionizing radiation, a characteristic widely used for measuring radiation dose.

In Denmark's Atomic Energy Com-

mission installation at Roskilde, he was responsible for similar dose measurements needed in research and for irradiation services. Under industrial contract arrangements, the Danish AEC sterilizes surgical supplies such as oxygenators for lung-heart surgery, syringes, blood donor sets (infusion and transfusion), and packaging materials.



Niels W. Holm

Army Awards \$13,222,358 for Redeye Production

The U.S. Army's shoulder-fired Redeye air defense guided missile system advanced significantly Apr. 10 when the Army announced awarding of \$13,222,358 in production and engineering contracts to General Dynamics Corp., the system's developer.

Delivery of production line missiles, when available, will be made to the U.S. Army Air Defense Board, Fort Bliss, Tex., where troop testing will be conducted.

As is normal in all missile programs, development work is continuing. The weapon has been jointly funded by the Army and the Marine Corps and both services will share in the missiles produced.

The world's smallest guided missile, Redeye is designed to give the combat soldier an effective means of de-

APG Expects Big Saving By New ADP Installation

A \$375,000 computer will go into operation this summer at Aberdeen Proving Ground, Md., sometimes called the "birthplace of the computer industry," to speed business-type data processing.

Expected to save \$110,000 annually, it will be the National Cash Register Co.'s 315 Electronic Data Processing System, scheduled for installation in June and requiring 715 square feet of office space.

Impact of the new system will be on civilian and military payrolls, cost accounting, financial management, manpower reporting, stock record accounting, fiscal accounting and related applications.

The NCR 315 will be housed and operated in the Proving Ground headquarters and will service data processing needs for all elements of the installation. Various card sorters, calculators, collators and accounting machines will be phased out of service to make way for the NCR 315.

Personnel operating equipment slated for retirement will be retrained as computer operators, systems analysts, programmers, control clerks and card punch operators by the time the NCR 315 starts operating an official source stated.

The data processing system, to be installed at the Proving Ground, will consist of a card reader, a central processor, three card random access memory (CRAM) storage units, a card punch and a high-speed printer.



REDEYE missile (in circle) moves into position to intercept droned aircraft. The aerodynamically controlled missile, through an infrared sensing device in the nose, homes-in on heat of the aircraft engine.

stroying low-flying aircraft. It can be carried into combat on the soldier's back and, like a Bazooka antitank rocket, is fired from the shoulder.

The Bazooka, however, is an unguided rocket, while Redeye is a true guided missile which can maneuver in flight. Redeye derives its name from the infrared heat seeking device it employs to "home" on the heat of an aircraft's engine. It can be taken anywhere a soldier can carry a rifle.

The infrared sensor, mounted in the nose of the 4-foot solid-propellant missile, is fin stabilized and aerodynamically controlled in flight. Target detection and tracking is accomplished visually by the gunner.

When the aircraft is within range of the missile and the infrared heat-seeker has "locked on" the target, a squeeze of the trigger fires the missile. Developers say it is highly improbable that aircraft can out-manuever the missile.

Although electronically complex, Redeye has been designed for simple, reliable operation and can be made ready for firing in a matter of seconds. Soldiers with only a few hours of instruction have been able to operate the weapon and score hits during developmental tests.

During these tests, which will continue, at the Naval Ordnance Test Station, China Lake, Calif., the missiles have scored direct hits on a variety of droned aircraft.

Ready for issue in the battle area, Redeye comes encased in a fiberglass launcher, equipped with carrying strap and sight, that also serves as a carrying case. After firing, the launcher is discarded. Eventually each combat company will have a 2-man team of Redeye operators. The Redeyes will come packed three to a case with spare batteries.

Since the weapon is sensitive, instructions for field use specify that it be handled with the same care as radio equipment.

Designed only for use against low-flying aircraft, Redeye "will knock any aircraft we know out of the sky," stated Lt Col Henry R. Claterbos, assistant project manager for the system during a press briefing Apr. 10. Project manager is E. K. Charlton, Army Missile Command, Redstone Arsenal, Ala., the agency directing the system's development.

Exact cost of each Redeye missile is classified, Col Claterbos said, but it should approximate the cost of a jeep, or "considerably less than the target aircraft it would destroy."

Exact range of the missile and the number being produced also is classified information. The original contract for development of Redeye to General Dynamics was let in 1959.



ENCASED in a fiberglass launcher, Redeye can be carried, made ready, aimed and fired from the shoulder by an individual combat soldier.

Fort Detrick Honors 3 With Retirement Ceremony Awards

Three U.S. Army Biological Laboratories and Fort Detrick, Md., officers with a total of more than 66 years of active military service were honored Mar. 31 at retirement ceremonies.

Brig Gen Fred J. Delmore, Edgewood Arsenal commander, headed distinguished guests, coworkers and relatives who joined in farewell respects to Col Carl S. Casto, retiring commander, Col Irving Gray and Lt Col Dorothy V. Elliott.

General Delmore presented the Army Commendation Medal with Second Oak Leaf Cluster to Col Casto for exceptionally meritorious service as leader of the BioLabs from August 1960 through March 1964. The citation stated:

"... During this period the Biological Laboratories' funding increased by almost 70 percent to a budget of approximately \$39 million. He introduced a system manager concept of management and administration and published a document which has remained the guideline for such operations at Fort Detrick and has served, in part, as a model for Edgewood Arsenal and the U.S. Army Munitions Command for research and development management. . . ."

The citation further credited Col Casto with assisting in formulating agreements with other related Federal agencies which resulted in the exchange of technical information of the "greatest importance to the Nation and the health of its citizens."

COL GRAY, chief of the Physical

Col Ruwet Succeeds Col Casto as Commander of Army BioLabs Leader

Col Vincent L. Ruwet took over as commanding officer of the U.S. Army Biological Laboratories at Fort Detrick, Md., when Col Carl S. Casto retired from military service Mar. 31.

The assignment makes Col Ruwet responsible for management and direction of an \$80 million research and development installation with a \$35 million annual operating budget. The BioLabs employ about 3,000 military and civilian personnel, 800 of whom are professional scientists and engineers with capabilities in 48 scientific disciplines.

A native of Torrington, Conn., he holds B.A. and M.A. degrees in bacteriology from the Universities of Connecticut (1938) and Wisconsin (1951).

Starting his career as an Infantry officer, Col Ruwet served in the European-African-Middle Eastern Theaters of Operation during World War



TAKING THE REVIEW at Fort Detrick retirement ceremonies are (l. to r.) Brig Gen Fred J. Delmore, CG, Edgewood Arsenal; Col Carl S. Casto, retiring Fort Detrick commander; Col Irving Gray, retiring chief of the Physical Sciences Division, U.S. Army Medical Unit; Lt Col Dorothy V. Elliott, retiring chief nurse, U.S. Army Medical Unit; Brig Gen Lloyd E. Fellenz, director, Office of Assistant Chief of Staff for Force Development; Col V. L. Ruwet, commander.

Sciences Division, U.S. Army Medical Unit until Mar. 31, and formerly scientific director of the U.S. Army Quartermaster R&D Laboratories at Natick, Mass., for three years, was awarded the Legion of Merit by General Delmore accompanied by a citation which recognized him for "... outstanding ability as a scientific investigator, research director, teacher and administrator, which was of great significance to the progress of Army scientific programs and contributed to man's understanding of highly technical factors in the fields of biochemistry and physiology."

Among his many other decorations

for World War II service as an Infantry officer in European campaigns, Col Gray has been awarded the Silver Star, Bronze Star with Oak Leaf Cluster, Purple Heart with Oak Leaf Cluster, Combat Infantryman's Badge and the Belgian Fourragere.

Col Gray has assumed a position as professor of biology at Georgetown University, Washington, D.C.

LT COL ELLIOTT at the time of retirement was chief nurse, U.S. Army Medical Unit at Fort Detrick. General Delmore presented her with the Army Commendation Medal for exceptionally meritorious service in that capacity.

A veteran of 20 years service in the Army Nurse Corps, she was cited for "... thorough knowledge of progressive hospital and nursing techniques, coupled with her keen perception into the requirements for care of patients suffering from highly contagious diseases ... development of outstanding isolation facilities and techniques vitally essential to the Medical Unit."

Security Industrial Group Meets

The Maintenance Advisory Committee of the National Security Industrial Association held an Apr. 21-22 meeting at the U.S. Army Missile Command attended by some 300 military and industrial leaders.

The symposium was sponsored jointly by the NSIA and the U.S. Army Supply and Maintenance Command. Brig Gen Charles W. Eifler, deputy CG for Land Combat Systems, welcomed conferees and Col Robert W. Grote, director, Supply and Maintenance Directorate was chairman.



Col Vincent L. Ruwet

WRAMC School to Spur Army Nurse Careers

Chief of the Army Nurse Corps Mildred I. Clark has devoted a great deal of energetic effort during the past year to recruit nurses in Operation Nightingale. Now, as another means of stimulating interest in an Army nurse career, a school leading to a B.S. degree will be offered by the Army in Washington, D.C.

Walter Reed Army Medical Center will open the school in September with an initial enrollment tentatively set at 135. This is expected to produce a graduating class of about 100. Student enrollees will be paid about \$100 a month and carry the rank of E-3s.

The Army Nurse Corps currently numbers about 3,000 despite the success of Operation Nightingale, which began in February 1963. The campaign more than doubled the number of applications for the Corps and its programs.

Students in the WRAMC school will receive two years of clinical and academic training for a B.S. degree, conducted at the University of Maryland. During freshman and sophomore years they may enroll in any college and the Army will pay for tuition, books and similar fees.

Six months before graduation the trainees will be commissioned second lieutenants. Three years of active duty in the Corps is required after successful completion of the course, open to men as well as women.



Col Mildred I. Clark

Operation Nightingale policy permits any professional nurses applying for a direct commission to select the first overseas duty station. Germany and Hawaii have proved popular choices.

Graduate nurses can be commissioned and continue their postgraduate work before reporting for duty in an Army hospital. They must remain on active duty for two or three years, depending on whether they have had one or two years of school at Army expense.

Future Nurses are being organized in numerous high schools and colleges through the efforts of Army nurse counselors. Another move to stimulate

interest in an Army career is a new film, "The Professional Nurse."

Governors of many states have given their support to the recruitment effort by proclaiming an "Army Nurse Corps Week" or an "Army Nurse Corps Day."

Dugway PG Takes Pride In 2 'Weather Women'

Dugway Proving Ground, Utah, boasts two women meteorologists and considering that the American Meteorological Society has only about 30 fair sex members, that is regarded as a distinction few Army units share.

Miss Elizabeth Jankus and Miss Margaret Mooney, both members of the national Society, have been "weatherwomen" since DPG July 1962.

In her normal work Miss Jankus is involved in meteorological instrumentation studies and low-level liaison between the Computer and Meteorology Divisions. In addition to this she is working on modernizing test grids.

Miss Mooney is the supervisor of the Data Production Section, which handles data reduction for all field trials and all Meteorology Division projects.

With similar backgrounds in their work, they have known each other since 1953. Both entered the Air Force during the Korean War and attended weather schools to become analyst forecasters. Both left the Air Force in 1956, Miss Jankus as a staff sergeant and Miss Mooney as an airman first class. Miss Jankus then spent two years at the University of Chicago, while Miss Mooney was at the University of Illinois for 1½ years.

The University of California at Los Angeles then attracted them and three years later they left with B.A. degrees in meteorology for a 6-month research project on solar energy in Hawaii. Upon completion of the Hawaiian project, the women accepted positions at Dugway.

Califano Appointed to S/D Post

Secretary of Defense Robert S. McNamara has announced appointment of Joseph A. Califano, Jr., as the Special Assistant to the Secretary and Deputy Secretary of Defense.

General Counsel of the Department of the Army since July 1963, Mr. Califano will carry out special projects and duties in various areas as may be assigned him. He succeeds Mr. Adam Yarmolinsky, who has been detailed to the White House as deputy to Mr. R. Sargent Shriver, Jr., on President Johnson's Anti-Poverty Program.

Woman Scientist Studies Puerto Rico Diet Deficiency

Maj Eleanor Pearson, known for her many contributions to professional publications since 1955, is the only U.S. Army Medical Service dietitian assigned to the U.S. Army Tropical Research Medical Laboratory in Puerto Rico.

Since May 1962 she has been deeply engrossed in a team study of experimental diets in an effort to learn why certain diets are effective in one case and not in another.

Arrangements with Puerto Rican authorities permit native patients suffering from dietary deficiency diseases to be hospitalized and observed at Rodriguez Army Hospital at Fort Brooke during the course of the Laboratory's research studies.

A native of Glenwood, Iowa, Maj Pearson earned her B.S. in chemistry and zoology at Wheaton College (Ill.) in 1937, and her master's degree in dietetics and nutrition from Iowa State College in 1948. She volunteered her services to the Army in 1940 and during World War II was chief dieti-

tian with the 127th General Hospital in Europe.

Reverting to inactive status in 1946, she was recalled to duty during the Korean War as chief of the diet kitchen at the Surgical Research Unit, Brooke Army Medical Center, Fort Sam Houston, Tex., and won the Army Commendation Medal.



Maj Eleanor Pearson
(Photo taken in 1960.)

Maj Gen Welling Addresses Military Engineers Society

An Army engineer who heads a complex and critical construction program involving more than one billion dollars was guest speaker at the Society of American Military Engineers April meeting at Redstone Arsenal, Ala.

Maj Gen A. C. Welling, division engineer for the South Atlantic Division, U.S. Army Corps of Engineers, spoke with the experience of more than 30 years in CE major construction activities. His current responsibilities include Cape Kennedy and the Mississippi Test Center of the National Aeronautics and Space Administration.

A 1933 graduate of the United States Military Academy, General Welling has jurisdiction over six District offices, including the Canaveral District, where construction of the \$37 million Titan III Launch Complex for the Air Force is in progress, and an estimated billion dollar program for NASA.

Prior to assuming his present duties he was assigned to the Air Force Systems Command as deputy commander for Site Activation in the Ballistic Systems Division. Earlier he had created and commanded the U.S. Army Corps of Engineers Ballistic Missile Construction Office, established by the Army in an all-out effort to direct and



Maj Gen A. C. Welling

expedite ICBM site construction.

General Welling supervised the design and construction of the emplacements which house Atlas, Titan, and Minuteman missiles, and was recognized by award of the Distinguished Service Medal for his achievements.

Springfield Armory Plans Youth Science Day May 12

Youth Science Day at Springfield (Mass.) Armory, an annual event calculated to stimulate the interests of high school senior science students in Army research performed at the Armory, has been scheduled for May 12. Each year the event is a highlight of the Armed Forces Week observance.

Nominations of qualified students will be submitted from more than 20 high schools in the Springfield system to fill key staff positions at the Armory for that day. Submission of essays indicating why a nominee wishes to be a staff member is a requirement.

Twelve students will be chosen for such titles as commanding officer, executive officer, comptroller, director of research and development, and other staff positions. Alternates also will be named for each position.

The choice of assignments to specific staff duties in an "honorary" capacity will be based upon entry material submitted to Dr. Alexander Hammer, chief of the Springfield Armory Support Research Branch and chairman of Youth Science Day.

The students will be introduced to a weapons program developed for the occasion and based upon requirements basic to the mission of the Armory. The final hour of Youth Science Day will be devoted to a staff meeting designed to summarize results.

SCIENTIFIC CALENDAR

International Conference on Power Reactors and Radioisotopes, sponsored by the Canadian Nuclear Association, Toronto, Ontario, Canada, May 25-27.

17th International Conference on Water Studies, Liege, Belgium, May 26-29.

12th Canadian High Polymer Forum, sponsored by National Research Council and the Chemical Institute of Canada, Quebec, Canada, May 27-29.

78th Annual General Meeting of Engineering Institute of Canada, Banff, Canada, May 27-29.

12th Canadian High Polymer Forum, sponsored by the Chemical Institute of Canada, Quebec, Canada, May 27-29.

47th National Conference of Chemical Institute of Canada, Kingston, Ontario, Canada, June 1-3.

11th National Conference and Annual Meeting of Society of Plastics Industry, N.Y.C., June 1-5.

20th CIGRE Conference (International Conference of Electrical Engineering), sponsored by the British National CIGRE Committee, Paris, France, June 1-11.

13th National Telemetering Joint Meeting, sponsored by IEEE, Instrument Society of America and AIAA, Los Angeles, Calif., June 2-4.

6th National Global Communications Symposium, sponsored by IEEE, Philadelphia, Pa., June 2-4.

18th Management Engineering Conference, sponsored by the American Society of Mechanical Engineers and Society for Advancement of Management, N.Y.C., June 4-5.

12th Annual Conference on Mass Spectrometry and Allied Topics, sponsored by the American Society for Testing and Materials, Montreal, Quebec, Canada, June 7-12.

14th Microwave Research Institute Series Symposium on Quasi-Optics, sponsored by MRI, IEEE, AFOSR, ONR and ARO, N.Y.C., June 8-10.

Summer Meeting of the Society of Automotive Engineers, Inc., Chicago, Ill., June 8-12.

Applied Mechanics Conference, sponsored by the American Society of Mechanical Engineers, Boulder, Colo., June 9-11.

7th Annual Meeting of Canadian Federation of Biological Societies, Halifax, Nova Scotia, June 10-12.

8th National Conference on Product Engineering and Production, sponsored by IEEE, Brooklyn, N.Y., June 11-12.

10th Annual Meeting of the American Nuclear Society, Philadelphia, Pa., June 14-18.

Summer Annual Meeting of American Society of Mechanical Engineers, Cleveland, Ohio, June 14-18.

9th Annual Meeting of Health Physics Society, Cincinnati, Ohio, June 14-18.

18th General Assembly of World Medical Association, Helsinki, Finland, June 14-20.

6th Informal Photochemistry Conference, sponsored by ARO-D and the University of California, Davis, Calif., June 15-17.

4th Conference on Electromagnetic Measurement, sponsored by IEEE, Boulder, Colo., June 16-18.

Harvard Conference on Plasticity and Fracture, sponsored by ONR, Cambridge, Mass., June 17-19.

11th Annual Meeting of National Society of Nuclear Medicine, Berkeley, Calif., June 17-20.

4th International Congress on Precision Electromagnetic Measurements, sponsored by the National Bureau of Standards, Boulder, Colo., June 18-20.

3rd International Congress on Vacuum Science and Technology, Frankfurt-Am-Main, Germany, June 19-27.

International Conference on the Physics and Chemistry of Solid Surfaces, Providence, R.I., June 21-26.

67th Annual Meeting of American Society for Testing and Materials, Chicago, Ill., June 21-26.

International Conference on Photosensitization in Solids, sponsored by AF Cambridge Research Labs, ONR, Space Physics Lab, and Illinois Institute of Technology, Chicago, Ill., June 22-24.

97th Annual Meeting of American Medical Association, San Francisco, Calif., June 22-26.

International Biophysics Meeting, sponsored by AFOSR, International Organization for Pure and Applied Biophysics, and National Academy of Sciences, Paris, France, June 22-27.

5th Joint Automatic Control Conference, sponsored by IEEE, American Society of Mechanical Engineers, American Institute of Chemical Engineers, and Instrument Society of America, Stanford, Calif., June 24-26.

2 BRL Employees Receive Exceptional Service Awards

Exceptional Civilian Service Award ceremonies at the U.S. Army Ballistic Research Laboratories, Aberdeen Proving Ground, Md., recently recognized research of Dr. Frank E. Grubbs and Dr. Turner L. Smith.

Lt Gen Frank S. Besson, Jr., commanding general of the U.S. Army Materiel Command, presented the Army's highest civilian award on behalf of Secretary of the Army Stephen Ailes.

Associate technical director of the Laboratories since June 1962, Dr. Grubbs was cited for his Ordnance systems research which enabled the Defense Department to "arrive at precise decisions on the selection and development of new weapons systems."

Dr. Smith, chief of the BRL Supersonic Wind Tunnel Branch from 1944-'63 (now retired and a consultant to BRL) was honored for his "notably outstanding contributions" to theoretical and practical aspects of wind tunnel design.

Dr. Grubbs graduated from Alabama Polytechnic Institute with a B.S. degree in electrical engineering (1934) and an M.S. degree (1935). He received a master's degree (1941) and Ph. D. (1949) in mathematical statistics from the University of Michigan. He was an instructor of engineering mathematics at Alabama Polytechnic Institute in 1934 and later an assistant professor.

Upon his arrival at Aberdeen Proving Ground in 1941, he served as chief of the Surveillance Laboratory.

In 1953, he became chief of the Weapons Systems Laboratory, BRL, and was concerned with infantry, artillery, tank, antitank and anti-aircraft weapons systems until he advanced to his present position.

Dr. Smith, a 1919 graduate of Rensselaer Polytechnic Institute, received his master's degree (1923) and Ph. D. (1931) from Harvard University. He taught mathematics at Rensselaer from 1919-1923, and later at Harvard.

After completing a Harvard traveling fellowship to Göttingen, Germany, he taught mathematics at Carnegie Institute of Technology. Later, he worked with Waco Aircraft at Troy, N.Y., as a stress analyst, then conducted research on shaped charges and underwater trajectories for the National Defense Research Council.

He is a member of the American Mathematical Society, the American Society of Mechanical Engineers, the American Physical Society and the American Association for Advancement of Science.



Lt Gen Frank S. Besson, Jr., CG, U.S. Army Materiel Command presents Exceptional Civilian Service Awards to Dr. Frank E. Grubbs (above) and Dr. Turner Linn Smith (below) while spouses observe during ceremonies at U.S. Army BRL.



Radio Rat Trackers Seek Cause of Leptospirosis

Tracking rats with radio may appear a mite unusual, but not for mite researchers at the U.S. Army Medical Research and Development Command's Research Unit at Kuala Lumpur, Malaysia.

Investigators attempting to learn more about the natural cycles of mite organisms which cause scrub typhus and leptospirosis attach tiny transmitters to wild jungle rats and track their movements by day and night.

Soldiers get leptospirosis in tropical jungles. Exactly how has been a burning mystery. Certain rodents are known to shed a million infectious doses in a single voiding of urine. A question has been to know exactly where.

Similarly, 5,441 U.S. Army troops in World War II contracted scrub typhus in Southeast Asia and the islands of the Southwest Pacific. A

total of 283 died. This disease would strike suddenly up to 50 or 75 percent of soldiers in one battalion while another battalion was untouched.

Known to be transmitted by barely visible chigger mites which live on the ground and usually feed on rats, the Army investigators in Malaysia needed to know the nests, resting spots, and runs of the mainly involved rats in hope of finding the ultimate density of the chigger mites.

The method of radio tracking of mammals was introduced to the Army Research Unit in Malaysia in February 1963 by Dr. Glen Sanderson, a biologist loaned by the Illinois Natural Survey Project of the University of Illinois. He had to adapt a technique used for skunks and racoons in America to the disease-carrying wild rats of Malaysia.

By reducing the weight of the radio

transmitter to about two ounces and shifting from a collar attachment to a shoulder harness, he marked a tiny moving disease factory which could be followed continuously through jungle or scrub.

Local technicians were trained to plot the locations of the infectious animals. The "blip" signals from the rats can be picked up at 300 yards. The transmitter power batteries last for two weeks, providing ample time to get a complete account of the particular rat's routine. This method has helped to explain the distribution patterns peculiar to these disease agents.

The radio receivers used on this project were constructed by W. W. Cochrane, director of the Bioelectronics Laboratory, University of Minnesota. Encouraged by a new tool for information on infectious disease, the Army investigators hope to apply the method to understand better the other diseases affecting the health of the field soldier.

The Principles of Laboratory Animal Care as promulgated by the National Society for Medical Research are observed in the research.

CSC Seminars Encourage Development of Federal Executives

The U.S. Civil Service Commission has announced that "Effects of Technological Development," a seminar in Federal Government affairs, will be offered to 37 selected key personnel at Kings Point, N.Y., June 1-12.

Scheduled at the Executive Seminar Center, as part of the Commission's career development program for executives, the seminar is one of ten on governmental affairs included in the Center's annual curriculum.

Attendance at the seminar on Effects of Technological Development, being offered for the third time this year, is limited primarily to employees in grades GS-14 and GS-15 or equivalent. Under rigorous criteria, personnel in grade GS-13 may be selected, as well as career executives in grade GS-16.

In cooperation with 44 Federal departments and agencies, the CSC offers the seminars to executives selected individually by their organization. By the close of FY 1964, about 555 careerists will have attended seminars at the Center during its first year of operation. All training spaces have been reserved.

Effects of Technological Development is exceeded in demand only by the seminar on Administration of Public Policy, which is being offered four times in FY 1964. Other courses in the seminar program are: Environment of Federal Operations; Public Policy and the National Economy; Social Needs and Federal Programs; Implications of International Conditions; The National Defense Establishment; Inter-Governmental Programs and Problems; Administrative Interrelationships; and Skills and Goals of Management.

Success of the Center has encouraged the CSC to consider plans for establishing similar centers in the Midwest and on the West Coast, in response to a growing Federal need for a steady supply of properly trained personnel to fill future vacancies in the highest career posts in the Federal service. CSC studies indicate that vacancies are likely to occur in about a third of the top positions within five years.

The study showed also that the typical Federal career executive has had 20 years of service, three-fourths of which has been in the same agency. Very often his experience has been concentrated in one program area or occupational field.

This pattern produces executives well versed in the technology and objectives of their own agency but lack-

ing in full understanding of how other agencies contribute to national programs, purposes and industrial management techniques which might be applied to Federal management.

The concentrated 2-week courses are designed for Federal executives who cannot be away from their agencies for longer periods. Instructors are top level personnel from Government, industry and universities.

Among the outstanding lecturers and discussion leaders who have participated in the seminars are: Arthur Schlesinger, Jr., who was Special Assistant to the late President Kennedy; Dr. Wallace Sayre, professor of government and public administration, Columbia University; Dr. Ernest S. Griffith, dean of the School of International Service, American Universi-

ty; Roger W. Jones, special assistant to the Director of the Bureau of the Budget; Dr. Harold J. Leavitt, professor of psychology, Carnegie Institute of Technology.

Additional information about the seminar program may be obtained by writing or calling the Executive Seminar Center, U.S. Merchant Marine Academy, Kings Point, Long Island, N.Y. 11024; Area Code 516, HUunter 2-8200, Ext. 343.

Acclaimed as a significant new concept in Federal executive development, the Kings Point Center made its bow on the interagency training scene on Oct. 7, 1963. By agreement between the U.S. Maritime Administration and the Civil Service Commission, the Center operates facilities provided by the U.S. Merchant Marine.

Army Considers Expanding Panama Meteorology Effort

The U.S. Army R&D Office, Panama, and the U.S. Army Electronic R&D Activity, Fort Huachuca, Ariz., are considering expansion of support to the Army Meteorological Team (RDT&E Support) in the Canal Zone.

Technical Director K. M. Barnett of the Meteorological Department at USAERDA was briefed on activities of the U.S. Army R&D Office, Panama, during a recent visit to the Canal Zone to discuss expansion of meteorological activities.

Col R. T. Larson, USARDO com-

mander, headed a briefing team that included Dr. Leo Alpert, chief of the Research Division, Lt Col H. V. Ellis as chief of the Test Division and CWO F. T. Young as commander of the Meteorological team.

Mr. Barnett also visited the Meteorological and Hydrographic Office of the Panama Canal Co., the U.S. Air Force Weather Detachment at Howard AFB, the Chiriqui Land Co. (United Fruit), and Weather Engineers of Panama, Corp., with whom close meteorological ties have been established by local Army facilities.

The U.S. Army R&D Office, Panama, has proposed that a master network of stations be established. It would include complete surface and upper air observations, utilizing the Air Force weather station currently operated at Howard AFB on the south coast of the Canal Zone, a new station to be established midway across the isthmus, and an expansion of the station at Fort Sherman on the north coast of the Canal Zone. A new station also would be needed to support research and tests at the Military Reservation at Rio Hato.

Satellite observational stations would be operated in various jungle, beach and inland locations to record the unique microvariations in atmospheric conditions that affect test and research activities.

Being considered is the expansion of capabilities of the meteorological team by addition of a climatologist so that a wide array of microscale and mesoscale measurements to support field research can be undertaken.



PANAMA R&D Office chief scientist Dr. Leo Alpert (left), U.S. Army Meteorological Team (RDT&E Support) commander CWO F. T. Young, and USAERDA Meteorological Department technical director K. M. Barnett discuss fungal growth on radiometer, one of the problems faced in operating meteorological instruments in the Canal Zone.

NSF-I Staff Sleuths Story of Science 'Blue Ox'

Sleuths (not sloths!) on the staff of Joseph Kraus, Science Service administrator for the National Science Fair-International, the 15th annual version of which is slated May 6-9 at Baltimore, Md., are trying (but not too seriously!) to determine authenticity of this Apr. 14 postmarked letter, rivaling the legend of Paul Bunyan's blue ox, "Babe."

Dear Mr. Kraus:

Today I shipped my two animals by railway express. The nice man at the depot said they should arrive in Baltimore by May 3, and I have sent enough food. Will you go down to the Baltimore depot and pick them up for me. My mother says we won't get to Baltimore until May 4.

By the way, the big steer (the one I fed with blackstrap molasses and the hormone) answers to the name of Bigun. The little one (my control group what had only the blackstrap) is called Daisy by all of us here at the farm. Daisy only weighs 2,200

pounds. Every time Pop sees Bigun he just shakes his head, swears a couple of good ones, and says those hormones really work.

I sure am looking forward to the Fair and all them scientists. My uncle Bill, who is the principal of our school, said he would send my name in as a contestant just to show up the Grange people who said I weren't scientific. With deepest appreciation and confidence.

Yours very truly,
Prudence Hogenbottom
Hermanville, Ohio

P.S. The problem, as Mr. Kraus sees it should he attempt to accommodate an unprecedented exhibit at the 15th NSF-I, is how to fit one "big steer" (weight undetermined) and the 2,200-pound Daisy within the exhibit unit limitation of 48 inches (side to side) by 30 inches (front to back). (Incidentally, Post Office listings fail to show a Hermanville, Ohio.)

Lt Col Spann Heads OCRD Communications Branch

Lt Col Frederick C. Spann was assigned Apr. 3 as chief, Communications Branch, Communications Electronics Division, Office of the Chief of Research and Development.

Before coming to OCRD he was U.S. Army military adviser to the South Viet Name Army. Other as-

CRD Reviews Latest Weapons In Springfield Armory Tour

The latest in weapon developments at the Springfield (Mass.) Armory was shown in April to the Chief of Research and Development, Lt Gen William Dick, Jr., and to a key group of Department of Army officials.

The U.S. Army Weapons Command installation was visited for a general orientation on current research and engineering activities at the Armory.

Briefings on specific programs were presented by Col William J. Durrenberger, commanding officer; Lt Col Stanley C. Skeiber, chief of the Armory Research and Engineering Division, and Herman F. Hawthorne, deputy chief; Dr. Alexander Hammer, chief of the Armory Support Research Branch; Edward J. Massa, chief, Support Engineering Branch; Earl M. Harvey, chief, Development Branch; Voitto A. Luukkonen, chief, Engineering Branch; Harry F. Lynch, assistant for Industrial activities, and Lt Edward R. Green, chief, Test Branch.

signments in recent years include: commander of Artillery Battalions supporting Corporal and Sergeant missiles; chief instructor and director of the Electronics Division, U.S. Army Artillery Guided Missile School, Fort Sill, Okla.; staff officer with U.S. Army Europe Headquarters; and battery commander during V-2 firings at White Sands Missile Range, N. Mex.

Born in Montgomery, Ala., he was graduated from the U.S. Military Academy in 1943 and received an M.S.E. degree in electrical engineering from Johns Hopkins University.

His decorations include the Bronze Star with Oak Leaf Cluster.

Fort Detrick Hosts AFCA Meet

More than 200 guests, including industrial and business leaders, participated in a recent dinner meeting of Fort Detrick and Chesapeake Chapters of the Armed Forces Chemical Association at Fort Detrick, Md.

Dr. William B. Rich discussed the historical development of the National Aeronautics and Space Administration, including new construction for the Moon Project at Cape Kennedy.

Brig Gen Fred J. Delmore, Edgewood Arsenal commander, gave the address of welcome and Dr. Charles E. Minark, chief of the Crops Division, talked on development of herbicides at Fort Detrick for industrial and military application.



By Ralph G. H. Siu

THE TALKING SKULL. The occasional flurries over the leakage of confidential information bring to mind an old African Nupe folk tale.

Once upon a time a hunter came across a human skull in the bushes. Whereupon he asked the skull, "What brought you here?" "Talking brought me here," the skull replied. After a few minutes of conversation, the hunter ran off to the king. "I found a talking skull in the bushes," said he to the king. "He asked you how its father and mother are?"

The king said, "Never since my mother bore me have I heard that a dead skull can speak." Then he summoned the Alkali, the Saba and the Degi and he asked for their knowledge on the subject. None of the wise men had heard the like. So they decided to send a guard with the hunter to check on the veracity of the story, and, if true, the reason for it. The guard accompanied the hunter into the bushes with the order to kill him on the spot, should he have lied.

When they arrived at the place, the hunter addressed the skull, "Skull, speak." The skull remained silent. All day long the hunter begged the skull to speak, but it did not answer. In the evening the guard ordered the hunter to make the skull speak, and when he could not, the guard killed him in accordance with the king's command. After the guard was gone, the skull opened its jaws and asked the dead hunter's head: "What brought you here?" The dead hunter's head replied: "Talking brought me here!"

THE FLY SWATTER. It is interesting to note the great difference in the way in which some individuals look northerly toward their boss and southerly toward their subordinates. In this connection, the following observation by a Japanese poet by the name of Kenbabo may be of interest:

The old chap who doesn't want to die swats the fly.

TENNYSON. Researchers aren't the only people who seem not warmly disposed toward reviewers. Tennyson began one of his poems thusly:

O you chorus of indolent reviewers, irresponsible, indolent reviewers.

PROMOTING SCIENCE IN THE COMMUNITY

(Continued from page 2)

In order to encourage future recruitment to Government positions, members of the Research Office participate in the Visiting Scientist Program sponsored by the American Institute of Physics. The scientist goes to the high school and presents interesting facets of scientific work to stimulate interest in science and engineering.

A related program is the annual career day in the local high schools. Engineers and scientists of the various disciplines make presentations to the students, pointing out the benefits of Government employment and the type of work to be encountered in the different scientific professions. Another program is the liaison for summer employment so the teacher may be more familiar with conditions in industry and thus stimulate the student on the choice of a vocation and working conditions.

Lack of engineering educational facilities in the immediate area made

it difficult to obtain and retain qualified technical people in the engineering and scientific professions. As a result, the Technical Advisory Council was formed which entered into contract negotiations with the State University of Iowa to conduct graduate courses in the area. Two of the three members responsible for motivating Council activities the last several years are Headquarters Research Office employees.

The addition of a Graduate Management Science degree program in the fall of 1962 to the Graduate Engineering program, in operation since the spring of 1957, has increased semester enrollment to over 200 students, with a requirement for more classes. For the past five years the Arsenal has furnished classroom space for these classes. Government employees fill about two-thirds of each class; the remainder of the students come from industrial firms of the Quint-City area.

Springfield Armory, which operates

in a different educational and industrial environment, has established a Youth Science Day which consists of choosing 12 highly qualified students from the high schools to occupy the major administrative and supervisory positions at the Armory for one day. The students meet the problems of their respective offices from the commanding officer down, discuss their impressions, and offer solutions to problems posed.

Another innovation of Springfield Armory is connected with a summer Science class composed of selected students of the Springfield High School system. On this occasion, presentations are made on several research subjects and the various research laboratories are visited. The day culminates in graduation exercises for the whole summer science program, with the keynote speaker supplied by Springfield Armory.

Watervliet Arsenal, the third installation of the Command, operating in a third type of educational and industrial environment, has limited community relations activities to liaison and information dissemination. Output information from their excellent research and development facilities has created a healthy attitude between the Arsenal and members of the various social and technical societies of the area. Presentations, lectures, demonstrations and publications of achievements and research results, when permissible, to the schools and colleges of the area help to stimulate interest as well as arouse curiosity in the minds of budding scientists and engineers.

Throughout the whole U.S. Army Weapons Command, visits have been arranged, presentations and lectures have been made, and demonstrations have been given to present and future scientists, engineers and teachers to familiarize them with the activities of the Headquarters and its installations. The purpose is to show them the role that R&D plays in the Army's capability and to encourage the students to consider R&D as a vocation.

Even though a large portion of the work is done on off-duty time, those Weapons Command employees who have been active in the science promotion program feel that the effort is rewarding and worthwhile in that high school and college students are encouraged to consider a scientific and engineering career, the image of the Government scientist and engineer is improved, and the local community is provided with a better picture of the Weapons Command role and responsibility, especially in R&D.

RIG FOR DIVE



M60A1 TANK, equipped with underwater fording kit, demonstrates capability of crossing a river or stream while fully submerged. Photo at left shows low silhouette of tank, 105 mm. armament and fording kit "conning tower." Lower left, tank commander directs crew as tank begins to submerge. Lower right, submerged in approximately 13½ feet of water the tank moves along the river bottom with only the "conning tower" and radio antennae showing. Ray L. Wiles, an Aberdeen (Md.) Proving Ground automotive engineer, was cited with the APG Development and Proof Services 1962 Director's Award for his development work and achievement in demonstrating feasibility of the kit.

SUBMERGE



UP PERISCOPE





Dr. Werner K. Weihe, an employee of the U.S. Army Mobility Command's Engineer R&D Laboratories, Fort Belvoir, Va., and internationally known for his work in infrared physics, recently was elected a Fellow of the Optical Society of America.

Membership as a Fellow in the Society is accorded only those who have "served with distinction in the advancement of optics."

A native of Germany, Dr. Weihe has been associated with the Labs since 1945 and is chief of the Far Infrared Branch, which is concerned with basic and applied research programs on far infrared phenomena, materials, components and techniques in the development of equipment.

Dr. Weihe was educated at the Universities of Halle and Jena, Germany. He is a senior member of the Institute of Electrical and Electronics Engineers, a Fellow of the Washington Academy of Sciences, a member of the Scientific Research Society of America, and is listed in *American Men of Science*. In 1961, he served as one of the editors for *Infrared Physics*, published by Pergamon Press.

Theodor B. (Ted) Edwards, the "original idea man" at USAERDL, has added another patent to his list.

The latest letter of patent is for a "Plural Generator Fed Motor Control System." The invention provides an improved electric motor which is



THEODORIC B. EDWARDS, recipient of awards for plural generator-fed motor and adjustable height propeller and drive assembly.

flexible, reliable, simple to operate and has a rapid response. It is applicable particularly to control the motor drive of tracked or self-propelled vehicles.

Col Philip G. Krueger, deputy commanding officer, presented the letter of patent and an award of \$100 to Mr. Edwards, along with an initial award of \$50 for disclosure of still another invention, an adjustable height propeller and drive assembly, for which patent is pending.

Holder of more patents than any other employee of the Laboratories, Edwards has received patents, either in his name or as coinventor, for such inventions as a self-contained vehicle heater for Arctic use, remote controls for a fire-fighting turret and nozzle, a foam generator, a vehicle wheel suspension system and an adjustable foam generator. A 1924 graduate of the University of Virginia with a degree in mechanical engineering, he has been with the Labs 20 years.

Two other employees at the Engineer R&D Labs, Taylor H. Jefferson and Billy F. Narron, shared a \$50 award for filing a patent application on a "keying device for embedment anchor."

Oscar P. Cleaver and Mrs. Hilda M. Helmcamp, who hold more work performance awards than any other USAERDL employees, recently added to their collection.

Col J. H. Kerker, commanding officer, presented Cleaver with his 12th Outstanding Performance Rating certificate and Mrs. Helmcamp with her 7th such award. In addition, Mrs. Helmcamp, a secretary in the Electrical Department, received a Quality Salary Increase award. Cleaver is chief of the Electrical Department and acting technical director.

Swante B. Swenson was given OPR

and QSI awards in recognition of his work as chief of the Model Shop in the Developmental Fabrication Branch. Miss Janet A. Foster, also received both awards.

Loyle R. Barrett received his third OPR as administrative assistant in the Mechanical Equipment Branch. QSI awards were made to Edward A. Baker, T. David Cooper, Carl R. Friberg, James A. Dennis, Mrs. Violet J. Lee, William A. Coppa, Eugene Osolinsky, Frank J. Gillespie.

The U.S. Army Engineer Geodesy, Intelligence and Mapping R&D Agency at Fort Belvoir presented OPRs to Howard O. McComas, Charles R. Manor, Mauritz Roos, Robbins G. Hickson and John G. Armistead. A Certificate of Achievement recognized CWO-3 Clarence M. Overbay.

Lt Col Leonard J. Bisaccia, chief of the diagnostic section, Radiology Service, Walter Reed General Hospital, was awarded the coveted "A" prefix for professional superiority.

The honor, given only infrequently to Army physicians and surgeons, indicates "clinical maturity, medical resourcefulness, technical skill . . . and the ability to impart one's knowledge to others."

A native of Connecticut, Col Bisaccia received his M.D. from the University of Vermont at Burlington in 1943. Commissioned as a lieutenant that same year, he has been at Walter Reed General Hospital since July 1961.

Lt Gen Colglazier Named Honorary Faculty Member

Lt Gen Robert W. Colglazier, Deputy Chief of Staff for Logistics, Department of the Army, has been awarded honorary faculty membership at the U.S. Army Logistics Management Center.

Col Felix J. Gerace, the Center commandant, presented the honorary faculty award to General Colglazier at a mid-April ceremony. The Center, a field activity of the Army Materiel Command, is the only Department of the Army agency devoted to post-graduate level education in logistics management.

General Colglazier was the guest speaker at the Fort Lee (Va.) Center's first graduation exercise on Dec. 22, 1954, and also awarded diplomas to the first 34 graduates.

During this address he stressed the importance of the Center, and said it was "the first building block in producing a balanced logistician." Since then the Center has graduated some 13,000 military and civilian students from all over the world.



Col J. H. Kerker, CO, USAERDL, presents 12th Outstanding Performance Rating certificate to Oscar P. Cleaver for his work as chief of the Electrical Department.

AFIP Data Processing Supports Medical Research

Researchers at the Armed Forces Institute of Pathology in Washington, D.C., seeking the cause and cure of many unconquered diseases, are turning investigations into what jokingly is termed "something of a numbers game."

Mathematics and medicine have found a compatibility which may speed the war against disease, even though the imaginative, creative type of investigator continues to play the important role in medical research.

Holding that view is Benjamin L. Parnell, chief, Medical Statistics Section of the AFIP. Under his leadership, data processing operations are providing a mass of statistics to back up research activities—giving better support to investigators.

The Statistics Section is moving ahead in research data processing technology by phasing from desk calculating machine and punched-card operations into a high-speed computer system. The results are said to be significantly reducing delays in research programs at the AFIP.

Magnetic tape computers allow storage of medical data compiled from case histories contributed to the Institute by military hospitals as well as by private physicians and hospitals, Veterans Administration hospitals, and U.S. Public Health Service. Data are correlated and catalogued by "memory tape" to provide high-speed access to a vast amount of information.

"AFIP is a tremendous repository of research data," Parnell said. "Although we are not in possession of all the facts about any one case or any one disease, by studying large numbers of cases, we can draw logical inferences about the characteristics of disease processes. Eventually, we will be able to find the most probable causes of many diseases."

We hope that our efforts will throw more light on the principle causes of certain diseases which are of primary importance to the military and the entire medical community."



Benjamin L. Parnell, chief of the AFIP Medical Statistics Section, observes as Mary E. Moseley, statistician, operates, Monrobot XI.

Geographer Exploring Himalayas for U. S. Army

Dr. Pradyumna P. Karan, associate professor of geography at the University of Kentucky, left in May on a 760-mile trek, mostly on foot, across the Himalayan mountains to gather geographical data for the U.S. Army

Proponent of the Bhutan Himalaya expedition is the U.S. Army Natick (Mass.) Laboratories and the U.S. Army Research Office is the major source of funding the project. Partial support is being provided by the Kentucky Research Foundation, which helped finance Dr. Karan's two previous trips to the region.

Army elements interested in the results of Dr. Karan's research include the Chief of Transportation, the Corps of Engineers and the Army Medical Service.

Dr. Karan will furnish the Army with copies of all maps and photographs resulting from the field work.

A comprehensive report also will be prepared on geographic, economic, political, social, religious and other characteristic conditions in the highly strategic area of Bhutan Himalaya.

The stated purpose of the expedition is:

- Geographical study of the Bhutan Himalayas to gather data relating to physical environment and cultural aspects of the area, particularly of the Great Himalayan region bordering Tibet.

- Detailed study and analysis of the terrain, climate, vegetation, land use, settlement pattern, and social political and religious characteristics of people in certain selected areas in Great Himalayan and Inner Himalayan regions of Bhutan.

- Discover the relation of the land use and settlement pattern to the physical, economic and social environments.

- Compile special maps and graphs, showing the distributional aspects of geographic elements in Bhutan.

Dr. Karan is being accompanied by a research assistant, G. R. Jani, an Indian mountaineer who accompanied him on a previous Himalayan expedition, and two native porters.

Previous work by Dr. Karan in the region includes:

- Geographical field research and land use mapping in Nepal, Himalaya, in 1956, supported by the Kentucky Research Foundation, the American Philosophical Society and the Population Council, New York.

- Geographical field research in Sikkim Himalaya and Western Bhutan in 1961, supported by the Kentucky Research Foundation, the American Philosophical Society and the Association of American Geographers.

Watertown Arsenal Installs Vacuum Arc Skull Furnace

A vacuum arc furnace which is extremely versatile for the melting and casting of titanium and the refractory metals, is being put into operation by the Metals Processing Branch of the Industrial Division, Watertown (Mass.) Arsenal.

An important feature of the furnace is a helium cooling system which insures safety of operation, in that the remotest possibility of water coming in contact with the molten metal has been eliminated. The furnace is designed to remelt and alloy scrap of various shapes and sizes.

Most commercial furnaces are well suited to melting stock in the form of pure virgin sponge, but some have limitations in melting bulky scrap. The skull furnace can melt bulky scrap and additional quantities of scrap and/or alloying elements can be charged during the melting cycle.

After melting and alloying, the metal is poured in a vacuum into ingots or inert molds and the ingots or molds can be hot topped (add heat to risers) with an auxiliary electrode to ensure a sound ingot or casting.

A vacuum arc skull type furnace is necessary for the melting of the reactive and refractory metals, since these metals will react with the graphite or sintered refractory sand lining crucible of vacuum induction furnaces.

The 600 kw. vacuum arc skull furnace which the Metals Processing Branch is putting into operation is touted as admirably suited for the production of static shape castings, centrifugal shape castings and centrifugal shape tubular castings for missile and aerospace applications.

Army-Supported Tropical Weather Studies Published

Results of an Army-supported observational field program to determine tropical weather processes in the area of the Island of Barbados, West Indies Federation, were published in March by the Meteorology Department, Florida State University.

Under grants from the U.S. Army Electronics R&D Laboratory, Fort Monmouth, N.J., and the U.S. Army Research Office, Arlington, Va., the meteorological team conducted the Barbados field program from August 1962 to Nov. 29, 1963.

The study was divided into two main parts—the collection and tabulation of existing climatological rainfall data from six islands in the experimental region; and observations with equipment and facilities established by the project on Barbados and over the ocean upstream of the island from the ocean research vessel, *R. V. Crawford*.

Principal investigator N. E. La Seur and field investigator Michael Garstang reported that success of the program surpassed their expected goals because of the invaluable and mutually beneficial cooperation and exchange of data between the Florida State group and several other meteorological teams working at Barbados.

Mentioned prominently in the report was the assistance of the United States Weather Bureau, particularly Dr. R. H. Simpson and the Research Flight Facility group.

Directly beneficial also was the surface wind, temperature and solar radiation data collected by the Brace Experiment Station and the High Altitude Research Project (HARP). Project HARP is a McGill University-Army Research Office joint meteorological program, based on the island since 1962, conducting upper atmospheric probes with a 16-inch gun.

The Florida State project was self-contained but the investigators reported that it grew significantly in scope through the exchange of data with these independent groups:

- Prof. Joanne Malkus, Department of Meteorology, University of California at Los Angeles, headed a group studying the structure and dynamics of cumulus cloud groups in relation to the obstacle and heating effects of the island.

- Joseph Levine led the Woods Hole Oceanographic Institution study of individual cumulus clouds and the environmental factors interaction.

- A group from Esso Research and Engineering Co., under the direction

of Dr. James F. Black, arranged to support the *R.V. Crawford* to obtain information on the natural influences of islands as obstacles and heat sources in augmenting precipitation. This group operated a specially instrumented tower and radiation devices to study the heat inflow and loss at and near the earth's surface.

Investigators also turned to other local meteorological sources. Rainfall data collected by previous observers represented nearly two billion observations over periods of from five to 10 years. Wind speed and direction up to heights of 50 feet above the surface were collected for seven locations on Barbados over a 2-year period.

The group obtained a climatological summary of Barbados weather from 1901 to 1960 from C. C. Skeete, former Director of Agriculture on Barbados, and monthly weather records for 1961-63 from the Barbados Weather Observers Association.

During the field observation program, the facilities established on

Barbados and at sea on the *R. V. Crawford* were designed to provide data from the surface boundary layer, the sub-cloud layer, the cloud layer and above the cloud layer to the lower stratosphere.

The Florida State investigators' report noted it was apparent that the dry season provides predominantly undisturbed conditions, particularly in the lower atmosphere, with a strong east to northeast trade current. This finding was used as a basis for comparison with the more disturbed conditions of the wet season.

The Florida State team has just begun analyzing the great mass of data collected to try to draw some conclusions about the geophysical factors and disturbances of tropical weather.

Hurricanes are a product of the tropics but their exact cause is unknown. Every study and bit of data collected, the report points out, is another step forward in better understanding and prediction of weather in a tropical climate.

Retiring Army Natick Labs Deputy CO Cited for Service

Col William J. McDonald, deputy commander of the Army Natick (Mass.) Laboratories of the U.S. Army Materiel Command retired Mar. 31 after 22 years of active Army service.

Brig Gen Merrill L. Tribe, Natick CG, presented Col McDonald with the Legion of Merit (First Oak Leaf Cluster) "for exceptionally meritorious conduct in the performance of outstanding services from June 1961 to March 1964," at a retirement ceremony.

The citation praised Col McDonald for his "sound judgment, keen percep-

tion and rare foresight" by which "he resolved a myriad of problems relating to the scientific-military operations of Natick Laboratories."

Before his assignment to Natick in 1961, Col McDonald was commanding officer of Sharpe General Depot, Lathrop, Calif. He received a bachelor of business administration degree from Northeastern University, Boston, in 1932, and a bachelor of law degree from LaSalle University in Chicago in 1938. He is a member of the New Hampshire Bar Association and the American Bar Association. Before entering military service he practiced law in Wolfeboro, N.H.

Col McDonald was commissioned a captain in the Signal Corps in 1941 and became a colonel during World War II. He served as signal officer in the Mediterranean Theater Headquarters at Caserta, Italy, and with the Services of Supply in Europe at Dijon and Paris, France.

Honors accorded him include the European Theater of Operations (ETO) ribbon with four battle stars, the Army Commendation Ribbon with Oak Leaf Cluster, the Crown of Italy (Officer's Class), the French Croix de Service (First Class), the Medalion of the French Foreign Legion (First Class) and the French Croix de Guerre with Gold Star.



Col William J. McDonald

London Standardization Group Serves ABCA Armies, NATO

One of the important overseas activities responsible to the Chief of Research and Development is the U.S. Army Standardization Group, United Kingdom (USASG-UK) located in London, England. It has a dual mission of furthering objectives of the ABCA Armies as well as those of the NATO countries.

Enhanced by the addition of Australia as a member in January 1963, up to which time it consisted of the United States, United Kingdom and Canada, the ABCA Army Standardization Program marked its 16th year of international cooperation last month. Its purpose is to effect the maximum economy for the governments concerned through use of combined technological and scientific resources in standardization of weapons and military items.

Within the framework of the Basic Standardization Agreement, the ABCA Standardization Group works toward specific goals in close coordination with United Kingdom counterparts in all of the combat arms and in most technical service areas. Col Edward L. Smith, U.S. Army, heads the Group as the senior standardization representative.

Goals include: Keeping each of the four armies fully informed on developments taking place in each of the member nations; guiding such development wherever possible along lines compatible with requirements of each; standardizing an end item when acceptable to more than one army; and recording it as a SOLOG (Standard, Operations and Logistics), if a non-materiel item, or as an ABCA Army Standard, if materiel.

End items in the materiel field range from spark plugs to missile systems. In the nonmateriel field, standardization includes such diversified items as operation orders, techniques for minefield laying and recording, adjustment of artillery fire, relief of combat troops, and military mapping.

The reciprocity concept among the four armies extends to joint funding and to the exchange of personnel, materiel, information, visits and joint use of facilities. (For further details on ABC Standardization Program, see March 1962 issue, p. 16.)

Tailored to fit the current organization of the Department of the Army, the organization of the London group (USASG-UK) includes deputies for Combat Development, Materiel Development, and for the U.S. Member,



Col Edward L. Smith

Army Board, Military Agency for Standardization.

Lt Col Arthur F. Mitchell is the deputy for Combat Development and serves also as the Armor representative. He monitors the United Kingdom Combat Development program and is responsible for the dissemination of information and advice on combat development matters.

Col Mitchell is assisted by the following staff action officers: Artillery, Lt Col John B. Desmond; Infantry, Maj William J. Bradley; Engineers, Maj Walter R. Hylander, Jr.; and Aviation, Lt Col Ralph H. Vohs.

U.S. Army staff officers act in conjunction with the Combat Development cells of the Arms Schools and their Ministry of Defence counterparts in the Arms Directorates, and assist in the coordination and exchange of combat development information.

The deputy for Materiel Development is Lt Col Richard C. Miles. Areas of responsibility include matters relating to materiel development, Mutual Weapon Development Program activities conducted in the UK, and participation in NATO Armament Committee meetings.

Professional specialty assignments of U.S. Army staff officers are: air-ground mobility, Lt Col Vohs; combat vehicles, Lt Col Mitchell; weapons and munitions, Lt Col Keith G. Comstock; guided missiles and electronics, Lt Col William A. Daugherty; CBR, Lt Col John A. Pierce, Jr.; combat clothing, personal equipment and basic research, Lt Col John C. McWhorter, Jr.; and airborne equipment, Maj William J. Bradley.

Close contact is maintained with British officers and technicians at all

levels of the Army Department, Ministry of Defense, the R&D establishments, the several schools, and training establishments, and civilian firms under military contract.

Representatives participate in Ad Hoc working group meetings, demonstrations of materiel and, in turn, furnish direct to the United States Army information and reports as required. They also escort U.S. Defense visitors to R&D establishments or UK-sponsored meetings involving standardization problems.

Characteristic development efforts within the U.K. now closely monitored by the U.S. Army Standardization Group include the HOBART communications system, the class 30 Assault Trackway, the SWINGFIRE ATGM system, aerial mine laying schemes, the 81-mm. mortar, hovercraft, and developments in improved parachutes.

On the NATO side of standardization, the senior representative is also the U.S. member of the Army Board, Military Agency for Standardization. His deputy is Lt Col John W. Moses, who acts on matters pertaining to NATO standardization and coordinates closely with the U.S. Army. His direct link with DA is the action officer in Assistant Chief of Staff for Force Development (ACSFOR).

Meetings of the U.S. Army Board are held mostly in London, seven or eight times each year, to consider and recommend for promulgation by the NATO nations standardization agreements (STANAGs) on all NATO operational, logistical and administrative procedures, prepared by the Board's 11 Working Parties and 10 Panels of Experts.

The latter groups meet annually to reconcile national views on a wide variety of standardization proposals, drafts, and related matters. Several members of the USASG-UK serve as U.S. representatives.

The most recent arrival in the USASG-UK is Maj Robert W. Krug who assumed duties in early March as secretary. He coordinates administrative requirements with officials of the U.S. Embassy, Headquarters CIN-NAVEUR, and various British agencies. His chief and only military assistant is S/Sgt Ronald H. Olson.

In existence in London since 1948, the USASG-UK seeks to insure that there will be no operational, materiel or technical obstacles to full cooperation and collaboration among the ABCA armies in the field of standardization for mutual defense goals.

Aerial Vehicle Development Spurred by Mobility Goals

(Continued from page 19)

flight of this aircraft is not scheduled until 1966.

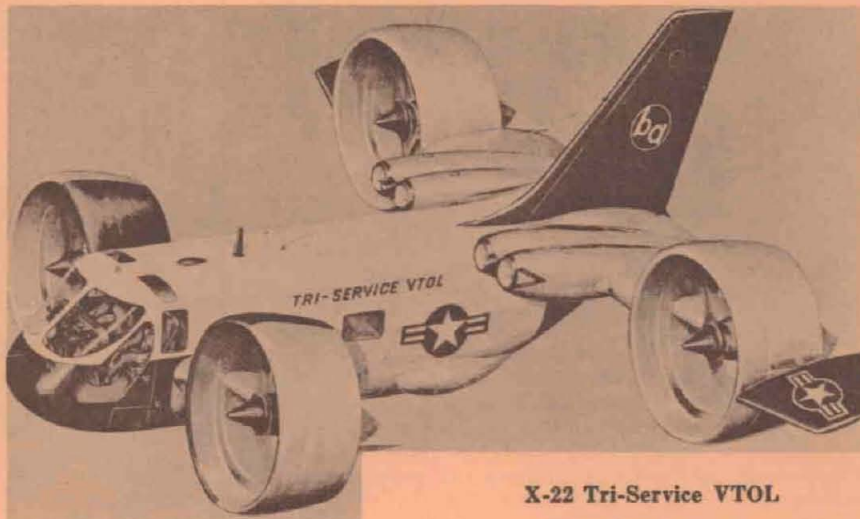
The last of the six tactical classes of U.S. Army aircraft is the Heavy Lift Helicopter System. For the interim period, the CH-47 Chinook, with a sling-load capability of seven tons, has been classified as standard. The CH-54, with a sling-load capability of 10 tons, will be undergoing tests next fall. It has not yet been adopted as a standard Army aircraft, but is designed primarily to provide a heavy-lift capability.

Some time in the 1970s, it is anticipated that the Army will have developed a helicopter with the desired 12 to 20-ton heavy-lift capability. This may be provided by a short-range, heavy-load lifting obstacle crosser such as many people envision in a "Flying Crane" configuration, or it may be a composite aircraft combining a heavy load-lifting capability with an internal troop and cargo lifting capability.

One of the problems in developing such an aircraft lies in reducing the weight of the propulsion system so that a moderately sized aircraft can lift the larger payloads up to 20 tons. To achieve this lightweight propulsion requirement, three techniques are being investigated. One is the use of a tip-turbine engine applying all its force at the tips of the rotor blades and not requiring any heavy ducting or gearing to the blades and the hub.

A small tip-turbine engine has been whirled successfully, and the next step in the program calls for whirling a 1,500-pound thrust J-69 Continental engine. The machine envisioned as a test bed for eventual application of this principle would employ a 4-bladed 112-foot diameter rotor with blades 6½ feet in chord. Two 1,500-pound thrust engines would be mounted on the tip of each blade.

A second lightweight propulsion concept is the hot-cycle rotor in which the gases from two turbine gas generators mounted in the fuselage would be piped through the hub and the blades and expelled through the rotor tips to provide thrust. The principle of operation is similar to that of a lawn sprinkler. The rotor



X-22 Tri-Service VTOL

X-19 Tri-Service VTOL



has been run successfully on a test stand and a flying test bed is being completed this spring.

A third program is investigating the means of providing lightweight shaft-driven systems with more reliable, lighter weight transmissions and gear boxes.

In future years, the Army intends

to continue to match aircraft system developments with state-of-the-art advances and phase developments so that aircraft system starts will be introduced on an economically supportable basis. The objective is to provide an adequate, orderly development program that can be supported within a reasonable funding level.

Col John L. Dibble has been chief of the Air Mobility Division, OCRD, since August 1963. Previous assignments include: Exercise Planning and Analysis Branch, J-3, STRIKE Command (1961-62); assistant commander, XVIII Airborne Corps Artillery (1961); Cold War and Area-wide Planning Officer, J-5, CINPAC (1958-61); chief, Foreign Military Training Branch, ODCSOPS (1955-57); chief, Artillery Assignment Branch, Career Management (1953-55); chief, Organization Branch, Logistics Division, Hq., EUCOM (1949-52); instructor, Artillery School (1946-49); command of 705th and 776th Tank Destroyer Battalions, European Theater of Operations (1945). Col Dibble received his B.S. degree from the U.S. Military Academy in 1940 and has graduated from the Command and General Staff College (1953) and the Army War College (1958).



Col John L. Dibble, Jr.



BRAZIL'S NEW PROVISIONAL PRESIDENT, General Humberto Castello Branco, is shown (left of Capt Richard Barnes, white uniform) during visit to the U.S.A.S. *American Mariner* in 1963 to learn about DAMP (Down-Range Anti-missile Measurement Program). Others (l. to r.) are Brigadier Silva Gomes, at that time CG, 2nd Air Zone, Brazilian Air Force; Capt Palhares, chief of staff, 3rd Naval District; Admiral Clovis, Brazilian Navy; Col. Perez, chief maintenance officer, Brazilian Air Force, 2nd Air Zone; Maj Gen Paes, commander, 7th Military Region; Lt Col Juan Rey, commander, 2nd Artillery Regiment; General Branco; Maj Magill; Lt Col Barreto, chief of Signal Services, 7th Military Region; Capt Barnes, Master of the *Mariner*; Fred Ise, RCA instrumentation manager on the *Mariner*; J. T. Hiles, RCA manager of *Mariner*; Lt Col Tom Dowd, U.S. Military Mission to Brazil, engineer officer; Dr. Byrnes, U.S. Alliance for Progress Program, U.S. State Department; Philip Alpern, manager for the Barnes Engineering Co. aboard the *Mariner*.

Army Officer on DAMP Feted Brazil's New President

Brazil's new Provisional President, General Humberto Castello Branco, is "very pro-American," in the opinion of a U.S. Army Research Office staff member who knew him well in connection with duty aboard the U.S.A.S. *American Mariner* on DAMP.

Maj Henry F. Magill, now assigned to the USARO Physical Sciences Division, was the U.S. Army Missile Command project officer aboard the *Mariner* for the study of missile nose cone re-entry into the earth's atmosphere on DAMP (Down-Range Anti-missile Measurement Program).

That assignment, which this publication reported on in detail (see April 1963 edition, page 15), brought Maj Magill into close contact with many of the top Brazilian military and government leaders.

"Brazil was our home port and Recife served as the staging area port for the Atlantic Missile Range during DAMP," Maj Magill said in explaining how a nose cone missile tracking ship assignment provided the opportunity to make friends with Brazilian leaders.

"We took advantage of every chance we had to give them a thorough understanding of DAMP by bringing them aboard the *American Mariner* for tours whenever we came into Recife. The American Consul General for Brazil was in accord with this manner of promoting understanding and friendship, and the U.S. Information Service also was favorable to the idea of the tours.

"As the Army project officer for the last 18 months before DAMP and the *American Mariner* were turned over to Air Force control, I did what I could to support the effort by entertaining many of the Brazilian leaders at dinners and receptions aboard ship in return for the hospitality accorded us whenever we went into Recife."

On one occasion, Maj Magill and his shipmates were hosts to General Branco, then the commander of the 4th Army of Brazil, many of the top Brazilian Army, Air Force and Navy leaders, the American Consul General and Dr. Byrnes of the U.S. State Department Alliance for Progress Program. In Latin American nations.



COMBAT DEVELOPMENTS BRIEFING attracted over 300 executive-level industry guests to the U.S. Army Combat Developments Command (USACDC), Fort Belvoir, Va. Cosponsored by the Association of the United States Army, the recent classified briefings covered the functional areas of USACDC and challenged industry's assistance in various problem areas. The program closed with a panel discussion composed of the five directors of USACDC (Plans, Doctrine, Materiel, Organization, Evaluation) and an Army-Industry Relations Panel of information officers or representatives from Office, Chief of Information; Office, Chief of Research and Development; Army Materiel Command and USACDC. Pictured are (left to right) Lt Gen Walter L. Weible (USA, Ret.), executive vice president, AUSA; Lt Gen Dwight E. Beach, CG, USACDC; Maj Gen William F. Cassidy, CG, U.S. Army Engineer Center and Fort Belvoir; and Maj Gen William F. Train, CG, USACDC Institute of Advanced Studies.