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Army Selects 20 Winners At NSF-I for Summer Jobs Or Visits to Laboratories

From 411 exceptionally gifted high school students who reached the finals of the 14th National Science Fair-International, May 6-10 at Albuquerque, N. Mex., 21 have been chosen for summer jobs in or visits to Army laboratories.

Army selectees were chosen because of the excellence of exhibits related to Army science interests, and choices also were made with a view to obtaining representation in all major disciplines. Still, seven of the Army selectees were among first or second place winners in the overall judging.

For the first time, high school students and science teachers from the surrounding area were invited to visit the exhibits and hear the lectures. The result was a turnout of more than 3,000 of them. Estimates set the total number of other visitors to the Fair at nearly 100,000.

Three of the Nation's most distinguished scientists headed the list of speakers, namely: Dr. Glenn T. Seaborg, Chairman of the U.S. Atomic

(Continued on page 26)

Featured in This Issue . . .

Realignment of Army Scientific Advisory Panel Reduces Membership to 25, Sets Up Consultants

Realignment of the Army Scientific Advisory Panel, limiting it to 25 members as compared to 55 or more in recent years, was made public when the ASAP convened May 20-21 at Aberdeen Proving Ground, Md.

Approved by Secretary of Defense Robert S. McNamara, the ASAP reorganization was directed by Secretary of the Army Cyrus R. Vance to make the high-level group of experts "more responsive to the needs of the Army."

Mrs. Jeanne Kelley, recuperated from surgery at Walter Reed General Hospital, holds valves identical to those used to replace defective mitral and aortic valves in her heart. (See story on page 7.)

Operating guidelines are set forth in Army Regulation 15-8, dated May 16, 1963, superseding Department of the Army Memorandum 15-435-1 dated Aug. 12, 1954.

Actually, all of the 54 ASAP members at the time of reorganization have been invited by Secretary Vance to continue to serve the Army as Panel members or consultants. From the consultants, ad hoc groups will be drawn for priority projects.

Only 13 members had been designated as this publication went to press. Eight places are being held open, to be filled at a later date from chairmen of scientific advisory groups to be established within major commands of the U.S. Army Materiel Command.

Dean Morrough P. O'Brien con-

(Continued on page 3)

Research, Development Personnel Win Pace Awards

Francis Shackelford (left center), former Assistant Secretary of the Army, presents citation for Pace Award to Lt Col C. J. LeVan, as Secretary of the Army Cyrus R. Vance and Mrs. LeVan look on. For details see page 2.

Army R&D Newsmagazine

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

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R&D Personnel Presented Pace Awards

Research and development personnel are the winners of the Pace Awards, presented for the first time to recognize outstanding contributions to the Army during 1962. The recipients are Lt Colonel C. J. LeVan, Chief of the Nike Zeus Office, OCRD, and Joseph A. Beauregard, Office, Chief Signal Officer.

Named for Frank Pace, Jr., Secretary of the Army from 1950 to 1953, the awards were presented May 23 by Secretary of the Army Cyrus R. Vance at a ceremony in the Pentagon, Washington, D.C.

The award, presented to one officer and one civilian each year, consists of a handsomely inscribed and framed citation. This year it was supplemented by a large marble desk set with the official Department of the Army seal countersunk in the base.

Lt Col LeVan's citation, based on four years of Nike Zeus service with OCRD, reads:

"For his conspicuously outstanding and invaluable service as adviser to the Chief of Research and Development and the Department of the Army staff on matters pertaining to Army ballistic missile defense research and development.

"His keen foresight, technical competence, and sound judgment, coupled with an unusual ability to grasp and explain the technical details inherent in the Nike Zeus advanced ballistic missile defense system, have enhanced his effectiveness as an Army spokesman for this vital program.

"His deep dedication and overall professional competence reflect great credit upon himself and the Department of the Army in keeping with the highest traditions of the military service."

Commissioned as a second lieutenant during World War II at the age of 19, he served in New Guinea as assistant operations officer of an antiaircraft artillery brigade. In Korea, he was an antiaircraft artillery battery commander and a brigade operations officer.

Lt Col LeVan has been a gunnery instructor, a test officer and an instructor in nuclear weapons at the Antiaircraft and Guided Missile School at Fort Bliss, Tex. He has received the Army Commendation Medal with three Oakleaf Clusters, one of which was awarded for his development of doctrine for the use of atomic weapons in air defense.

JOSEPH BEAUREGARD's citation made no reference to what superiors considered exceptional performance of duty during the Cuban crisis last fall when he organized the overall Army communications system for rapid response to fast-changing conditions. He also has been recognized for his studies and plans for improvement of communications in the Latin American area. The citation reads:

"For his conspicuously outstanding and invaluable service in planning, coordinating and implementing improvements in the communications posture of the United States in the Western Hemisphere.

"His perception and ability to organize and develop a unified communications program with the necessary flexibility to adjust to changing conditions have materially enhanced the capabilities of the Department of the Army in this area.

"His professional competence and deep regard for his field of endeaver reflect great credit upon himself and the Department of the Army in keeping with the best traditions of the Federal service."

Francis Shackelford presents Pace Award citation to Joseph A. Beauregard, Chief Signal Office communications planner, as Mrs. Beauregard observes.

Army Scientific Advisory Panel Realigned

(Continued from page 1)

tinues as ASAP Chairman, a post he has held since July 1961. One of the 10 original Panel members appointed by then Secretary of the Army Frank Pace, Jr., in 1951, he has served continuously. Likewise, Dr. William Van Royen continues as Vice Chairman.

ASAP members are appointed by the Secretary of the Army upon recommendations by the Assistant Secretary of the Army (R&D) and the Chief of Research and Development. The Chief Scientist of the Army, Dr. Harold C. Weber, is a Member Ex Officio and retired Chairman of the Board of Chrysler Corp. K. T. Keller is listed as Member Emeritus.

Two former Army Chiefs of Research and Development, Lt Gen Arthur G. Trudeau and Lt Gen James C. Gavin, both retired, have accepted invitations to serve as consultants to the Panel. Appointment of one or two more new consultants of their stature is being considered.

From the ASAP consultant group five ad hoc committees were selected at the Aberdeen meeting. Projects of special concern on which they will work were requested by Chief of Research and Development Lt Gen Dwight E. Beach after discussions with Lt Gen Frank S. Besson, Jr., Commanding General of the U.S. Army Materiel Command, and Lt Gen John P. Daley, CG of the Army Combat Developments Command.

Areas in which the consultant groups will work are: scientific personnel, antitank weapons, air defense, tactical communications, and V/STOL aircraft.

In addition to Dean O'Brien, Dean Emeritus of the College of Engineering at the University of California, the members of the new ASAP are: Dr. Ernest Weber, president of Polytechnic Institute of Brooklyn and also chairman of the Army Junior Science and Humanities Program Advisory Council; Dean Ralph E. Fadum, School of Engineering, North Carolina University;

Dr. Roger W. Russell, Professor of Human Factors and Head of the Department of Psychology, Indiana University; Dr. Harwood S. Belding, Professor of Environmental Physiology, University of Pittsburgh; Dr. Hector R. Skifter, president of Communications Airborne Instruments Laboratory, Electrical Division of Cutler-Hammer, Inc.;

Dr. John E. Vance, Professor of Chemistry at New York University; Dr. William Van Royen, Head of the Department of Geography, University of Maryland; Dr. Charles C. Lauritsen, Professor of Physics, California Institute of Technology; Dr. Walter J. Nungester, Department of Biology, University of Michigan Medical School;

Dr. Clifford D. Furnas, Chancellor, University of Buffalo; Charles H. Zimmerman, Director of Aeronautics Research, National Aeronautical and Space Administration; Maj Gen K. D. Nichols (USA, Ret.), who in 1952-53 served in a capacity which later was titled Chief of Research and Development, and who from 1953-55 was General Manager of the U.S. Atomic Energy Commission.

The stated mission of the ASAP is "to advise the Secretary of the Army, the Chief of Staff, the Assistant Secretary of the Army (R&D) and the Chief of Research and Development on overall scientific and technical matters of concern to the Army Research, Development, Testing and Evaluation Program and to provide long-range guidance in these areas, as appropriate."

Chief of Staff General Wheeler Addresses ASAP

Army Chief of Staff General Earle G. Wheeler made his first formal presentation to the Army Scientific Advisory Panel at its May 20-21 meeting at Aberdeen Proving Ground, Md.

Present were many high-ranking Department of Defense and major Army command leaders, including Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen, Army Materiel Command Commanding General (Lt Gen) Frank S. Besson, Jr., and Chief of Research and Development Lt Gen Dwight E. Beach.

Deputy Director of Defense Research and Engineering (Tactical Warfare Programs) Dr. John L. McLucas represented Dr. Harold Brown, DDRE, along with Dr. Eugene G. Fubini, DDRE (Research and Information Systems).

Other military leaders in attendance included Lt Gen Charles B. Duff, Comptroller of the Army; Maj Gen William J. Ely, Deputy CG, Army Materiel Command; Maj Gen C. W. Clark, Director of Army Research; Maj Gen Stuart S. Hoff, CG of the Electronics Command, AMC;

Maj Gen T. H. Lipscomb, Deputy CG, Combat Developments Command; Maj Gen Frank H. Britton, Director of Research and Development, Army Materiel Command; Brig Gen Fred J. Delmore, CG of the Chemical Biological Radiological Agency; and Brig Gen Allan D. Hulse, Director of Developments, Office of the Chief of Research and Development.

Defense Science Board members who took part in the meeting included Dr. Walter H. Brattain, Dr. Thomas E. Caywood, Dr. Lloyd P. Smith, Patrick E. Haggerty and Dr. William G. McMillan.

Thirty-four of the 54 members of the Army Scientific Advisory Panel participated in activities that included tours to the U.S. Army Human Engineering Laboratories, U.S. Army Coating and Chemical Laboratory, Ballistic Research Laboratories and other Proving Ground R&D facilities.

COMMANDING GENERALS of the U.S. Army's three most powerful Stateside commands under the general reorganization effected in 1962 posed for the photographer at a recent meeting at Fort Belvoir, Va., headquarters of the Combat Developments Command. Operational and organizational as well as materiel requirements and concepts were discussed in the closed meeting. Left to right are: Lt Gen John P. Daley, U.S. Army Combat Developments Command; General John E. Waters, U.S. Continental Army Command; and Lt Gen Frank S. Besson, Jr., U.S. Army Materiel Command.

Army Chooses CIDS to Launch New Tech Information Program

Chemistry is the major discipline in which the Army will first undertake a full-scale effort to achieve a "quantum advance" in collection, processing and dissemination of technical information based on its new "chemical typewriter."

A carefully planned Army Chemical Information Data System (CIDS) is incorporated in the Army Scientific and Technical Information Program developed after months of intensive effort and approved early this year by the Department of Defense.

Designated as project officer to implement CIDS is Peppino N. Vlannes, Deputy Chief of the Scientific and Technical Information Division, U. S. Army Research Office, OCRD.

Key assistants who had been named to work with him at press time included Dr. Eli Freedman, Aberdeen Proving Ground, Md.; Lt Col Francis W. Lanard, U.S. Army Medical Research and Development Command and Alfred Feldman, Walter Reed Army Institute of Research.

First described to the reading public in an article carried exclusively in this publication (see May 1962 issue, page 14), the chemical typewriter developed by a 6-man team at the Walter Reed Army Institute of Research has passed extensive tests since that time.

At press time the opening of bids for manufacture of production models was only hours away. Expected to have a profound impact on the processing of chemical information throughout industry, as well as throughout the Defense establishment, the CIDS (Chemical Information Data System) is linked to use of high-speed computers.

Dr. David Jacobus, Chief of the WRAIR Department of Radiobiology, headed the team which developed the chemical typewriter, based on a concept advanced by Alfred Feldman. Now in charge of the WRAIR coding and literature sections, Feldman was formerly an assistant editor of *Chemical Abstracts*.

The ACT (Army Chemical Typewriter) is expected to be rolling off production lines in from 6 to 10 months, Dr. Jacobus said. Distribution to about 15 major Army technical information centers concerned with chemical information is not expected until about June 1964.

Capable of handling any chemical formula with ease, the ACT has an input and an output (encoding and decoding) capacity. The system is geared to the conversion of punched paper tape to magnetic tape used in computers.

Dr. David P. Jacobus (left), Chief of WRAIR Department of Radiobiology, explains operation of Chemical Typewriter to Walter M. Carlson (right), Defense Director of Technical Information; Col Andrew Aines (right center), Director of Army Technical Information; and Col J. D. Goldstein, Chief, Nuclear Energy Division, R&D Command, Office of the Army Surgeon General. Seated at typewriter is Alfred Feldman, chemist in Department of Radiobiology who originally suggested the concept of the system.

The working prototype tested at WRAIR during the past year has demonstrated a high speed processing capability acclaimed by many top leaders concerned with chemical information.

Army interests might be served desirably, from the viewpoint of benefits accruing from standardized systems, if widespread use is made of the chemical typewriter. Dr. Jacobus emphasized, however, that "any other technique which enters the whole molecule in feeding formulas into the computer would be compatible with the Army system."

The more uniform links established in the transmission network, he said, the more effectively the total system can function in meeting Army requirements for chemical information.

Industry, as well as all Department of Defense and other interested agencies, will be able to procure the chemical typewriter as soon as it is rolling off the production line. Cost: About $17,000 each.

Currently, except for the working prototype of ACT installed at WRAIR, the Army has no system in wide operation for handling chemical formula information. Since a great deal of Army money is involved in chemistry, the importance of an adequate system to process chemical formulas becomes obvious.

"Chemistry was selected for the initial major effort to improve the Army scientific and technical system because of all the nonnumerical sciences, it is the digital discipline—that is, it is essentially machinable." That explanation was given by Col Andrew A. Aines, Director of Army Technical Information.

The application of computers to chemistry information requirements, in the opinion of Dr. Jacobus, "may well bring to the profession the same advantages which these machines have brought to mathematics, astronomy and business administration."

In undertaking to implement its Chemical Information Data System, the Army plans close cooperation with all other chemical information agencies, particularly such organizations as American Chemical Society Chemical Abstracts and the Engineers Joint Council.

The recently published report of the President's Science Advisory Committee titled *Science, Government and Information*, prepared by a special subpanel headed by Dr. Alvin M. Weinberg, Director of the

Oak Ridge (Tenn.) National Laboratory, made special reference to the suitability of chemistry information for high speed processing techniques.

While various chemical data processing devices have been developed, the chemical typewriter is believed the first machine that permits the encoding or decoding of the whole molecule in a high-speed mechanical operation.

The principle is that it automatically assigns "unique numbers" when the chemical structure is typed, by automatically recording the position of the paper at the time a key is depressed. The typed output contains the key symbol indicating the atom or bond involved, and also the X and Y coordinates of the paper position representative of the unique number, e.g., line 15, space 19.

The typist may roll the platten backwards as necessary in the typing of chemical structures. Moreover, she may not need to type the whole structure; portions of structures that recur frequently can be encoded by means of the tape recorder.

Discussions relative to implementation of the Army Chemical Information and Data System, held at the U.S. Army Research Office in April 1963, established five phases of the program to run concurrently.

Phase 1, assigned to The Surgeon General, consists of the procurement of the chemical typewriters and related equipment, and the formulation of machine programing techniques for the atom-by-atom search for chemical structures and fragments.

Phase 2 is assigned to the Chemical, Biological, Radiological Agency of the Munitions Command, U.S. Army Materiel Command. An action plan is to be based on determination of user needs and total resource requirements, embodying the most advanced techniques and equipment for automated processing and data transmission.

The CBR Agency is assigned responsibility to establish and maintain a centralized Army facility for chemical data and information services "in consonance with the total Department of the Army scientific and technical information program."

Phase 3 is assigned to the U.S. Army Electronics Research and Development Laboratories, U.S. Army Materiel Command. A comprehensive investigation is to be made of the CIDS communication requirements, including the spectrum of data and information transmitting devices — "and a projection of the use of potential devices not currently available."

All studies and evaluations will be examined further in view of their broad application to the handling and transmission of scientific and technical information.

Upon completion of Phase 1, The Surgeon General will continue to provide technical assistance to subsequent phases of the program. The action plan of Phase 2 is to be completed to coincide with delivery of equipment procured in Phase 1.

The Ballistic Research Laboratories, Aberdeen Proving Ground, Md., are assigned Phase 4. This is the task of evaluating and developing computer programing techniques and related mathematical models, capable of being utilized by existing Army computational facilities required for the establishment, operation and continued improvement of CIDS.

Specifically provided in guidance for Phase 4 is that "programs and models will be examined and made applicable to other Department of the Army information and data systems." Aberdeen Proving Ground installed in 1962 one of the world's fastest computers, specially designed to meet Army requirements. (See April 1962 issue, page 3.)

Phase 4 is to begin with an evaluation of "Associative Factor Indexing" developed by the National Security Agency. It requires also that the Ballistic Research Laboratories provide an "alternate site capability for services relevant to the Department of the Army Chemical Information and Data holdings."

Phase 5 requires that all other program participants will make an inventory of their CID holdings and develop recommendations to phase these into the total system.

AFIP Presents Annual Course On Introduction to Research

The Third Annual Postgraduate Introduction to Research Methods Course was presented by the Armed Forces Institute of Pathology (AFIP) May 6-10 in Washington, D. C.

Instituted by the Scientific Director, Dr. Robert E. Stowell, the course is designed to provide beginning researchers with basic instruction and sources of further information on a variety of subjects including selecting, planning and carrying out research problems.

A faculty of 60 researchers, including physicians, Ph.D.s, veterinaries and dentists, presented lectures on their specialties to 59 students. Panel and laboratory demonstrations and conferences, motion picture research films, and exhibits were offered.

Speakers included Maj Gen Richard L. Bohannan, Deputy Surgeon General of the United States Air Force; Rear Adm C. B. Galloway, Assistant Chief for Research and Military Medical Specialities, Bureau of Medicine and Surgery, Department of the Navy; Brig Gen Benjamin A. Strickland, Jr., Assistant for Bioastronautics, SCGB, Headquarters, Air Force Systems Command; and Dr. Harry Goldblatt, Mount Sinai Hospital, Cleveland, Ohio.

Col Bates Shifts From Monmouth to Japan Unit

Col Raymond H. Bates, Deputy Commander of the U.S. Army Electronics Research and Development Laboratory at Fort Monmouth, N.J., has been reassigned.

As Commanding Officer of the U.S. Army Signal Communications Agency at headquarters of the U.S. Army forces in Japan, he will assume his new duties July 1. Assigned to the Laboratory since February 1960, he served as Director of the Engineering Sciences Department and as Director of the Communications Department before becoming Deputy Commander in September 1960.

Prior to his assignments here, Col Bates had served in the Pentagon in the Combat Development Division of the Office of the Deputy Chief of Staff for Operations, Department of the Army.

A graduate of the U.S. Military Academy in 1940, he served in Europe during World War II and was awarded the Bronze Star. He has a master of science degree in electrical engineering from the University of Pennsylvania (1951) and his service schools include the Command and General Staff College.

Col Raymond H. Bates

Army Honors Duke University Scientist With Top Award

Dr. Paul M. Gross, William Howell Pegram Professor of Chemistry at Duke University and a faculty member there for 44 years, was honored June 3 with the Department of the Army's Distinguished Civilian Service Medal.

This is the highest award which can be given to a civilian by the Secretary of the Army. It is awarded to "private citizens, Federal Government officials at the policy development level, and technical personnel who serve the Army in an advisory capacity or as consultants, who render distinguished service during peacetime which makes a substantial contribution to the accomplishment of the Army's mission."

Maj Gen Chester W. Clark, Director of Army Research, Office of the Chief of Research and Development, made the presentation on behalf of Secretary of the Army Cyrus R. Vance in the office of Duke University president, Dr. Daryl Hart. He said Dr. Gross has had a "strong influence on the development of a progressive basic research program and in helping to solve scientific problems that have confronted the Army."

The citation praised Dr. Gross for his "distinguished and dedicated civilian service as consultant and adviser in Ordnance research for the past 18 years, for his astute guidance as a member of the Picatinny Arsenal Scientific Advisory Committee, and for his conspicuously outstanding leadership of the Senior Scientific Steering Group."

Duke University President Deryl Hart and Mrs. Paul M. Gross observe as Maj Gen C. W. Clark presents Distinguished Service Award to Dr. P. Gross.

Dr. Gross is past president and current chairman of the Board of the world's largest scientific organization, the American Association for the Avancement of Science. One of the incorporators of the Oak Ridge Institute of Nuclear Studies, he has served as its president continuously since 1949. He served as a member of the Board of the National Science Foundation under three Presidents—Truman, Eisenhower and Kennedy, and has been a consultant to numerous governmental agencies at both the national and state levels.

Dr. Gross, along with Dr. Marcus E. Hobbs and Dr. J. J. Gergen, worked with the Army in the postwar years in getting the Office of Ordnance Research established on the Duke campus in 1951.

Later, the duties of this office were expanded beyond ordnance work to encompass the entire basic research program for the Army, and the office at Duke was redesignated the Army Research Office-Durham. Both Dr. Hobbs and Dr. Gergen were honored earlier by the Secretary of the Army for their roles in this endeavor.

One of the first jobs which Dr. Gross did for the Army was one of the most important. During World War II, the Army Air Corps was in need of a realistic way to train aerial gunners, but did not wish to involve the risk of using "live" ammunition to shoot at towed targets.

Dr. Gross, aided by a group of scientists from Princeton University, worked at Duke and successfully developed a .30-calibre plastic bullet for use in air-to-air target practice. Their efforts were credited with substantially aiding the U.S. war effort, and Dr. Gross was awarded the President's Medal for Merit.

From 1951-61 he was chairman, Senior Scientist Steering Group, Office of Ordnance Research; and in 1961-62 was chairman, Ordnance Corps Scientific Advisory Committee (AROD).

In 1958 he was appointed an Honorary Commander, Civil Division, Order of the British Empire by Her Majesty Queen Elizabeth II. He also holds the Herty Medal as the most outstanding scientist in the South (1945); the Florida Section Award of the American Chemical Society for his outstanding contributions and service to humanity through the science of chemistry (1952); the Southern Association of Science and Industry Award for outstanding work in Southern Regional Development (1951); and the Carnegie "Manship" award (1954).

MAULER'S BRITISH Assistant Project Manager Lt Col Dennis Ewart-Evans (left) arrived last month at Redstone Arsenal, Ala., to head a group of United Kingdom missilemen who will study development of the front-line antiaircraft missile system. Looking over a model of the Mauler are (l. to r.) Col Ewart-Evans; Lt Col William Graham, British Liaison Officer; Lt Col Norman T. Dennis, Mauler Project Manager; and Brig Gen H. P. Persons, Jr., Deputy CG, Missile Command for Air Defense Systems.

Rare Heart Operation at WRAIR Pays Off for Army Wife's Gamble With Life

Facing death squarely, with the odds stacked 3 to 1 against success of a very rare heart operation performed recently at the Army's Walter Reed General Hospital, Washington, D.C., has rewarded an Army wife with a new life.

The operation required replacement of two valves in the heart of Mrs. Francis Kelley, married to a major stationed at Fort Meade, Md., with artificial transplants. On June 4, the 38-year-old mother of two children left Walter Reed with the hope of a normally long and active life.

Lt Col Edward J. Jahnke, Jr., Chief of the Thoracic and Cardiovascular Surgery Service at Walter Reed and head of the team which performed the operation, said only three similar double-valve replacements have been reported.

The estimated risk in Mrs. Kelley's case was 75 percent (as compared to 10 to 15 percent risk for a single valve replacement), but she considered progressively worsening effects of rheumatic heart disease as a child, and gambled on the outcome.

She almost lost. Twelve hours after the operation, the normally fatal fibrillation began. Although a patient frequently succumbs to one such attack, she suffered 15 to 20 in the next 48 hours. Physicians kept her alive with the aid of an electric defibrillator which shocked her heart back to regular pulsing.

The new valves remained firmly in place during the emergency measures and suffered no damage, physicians reported. Known as Starr valves in honor of the inventor, Dr. Albert Starr of the University of Oregon, they are composed of special stainless steel circular frames rimmed with Teflon around silastic balls.

Static tests of the valves on an artificial heart showed that they were still functioning perfectly after 43 work years. Now, after a long period of comparative inactivity as an invalid, and six weeks of recuperation in the hospital following the operation, Mrs. Kelley has good expectation of giving the valves a long workout, physicians believe.

Mrs. Kelley has been advised that she can expect to lead an "essentially normal life now," including doing her own housework and even indulging in one of her favorite family sports—golf. She looks forward to joining her husband, 16-year-old son Francis, Jr., and daughter Shaun, 14, in a foursome.

Four years ago she was told that the surgery she needed carried too great a risk to be attempted. Now Dr. Jahnke attributes the success of the operation to a happy combination of circumstances—her attitude, the excellent heart-lung equipment, and the coordinated teamwork of the operating staff which resulted in completion of the operation in about 90 minutes instead of the usual three to four hours.

The teamwork was provided by Lt Col George W. Fisher, Col Philip J. Noel, Lt Col John H. Sharp, Capt Robert W. Benson and Maj Samuel C. Carter for the operation, with Melvin E. Chambers and Lt Frederick H. Ayers, Jr., on the heart-lung machine.

Army R&D Leaders View AAAA Junior Science Fair

When the Army Aviation Association of America, Washington Chapter, staged its second annual Washington region junior science fair in May, high-ranking Army leaders viewed exhibits, all related to Army aviation.

Chief of Research and Development Lt Gen Dwight E. Beach and Dr. Nicholas E. Golovan of the President's Science Advisory Committee turned out for the occasion.

Other distinguished leaders included: Maj Gen T. H. Lipscomb, Deputy Commanding General for Materiel Requirements, U.S. Army Combat Developments Command; Brig Gen J. G. Zierdt, Deputy Director of Research and Development, U.S. Army Materiel Command; Brig Gen O. G. Goodhand, Chief of Staff, Third U.S. Army Corps, the national Army Aviation Association representative; and Col Robert H. Schulz, Acting Director of Army Aviation, Deputy Chief of Staff for Operations.

Contestants were the finalists from each of four district competitions in the Washington metropolitan area, and judges selected one winner from each district, namely: Marshall Curtiss of Woodrow Wilson High School, Wesley J. Pouliot of Kenmore Junior High, John David Weston of Einstein High School and Terry Dawson of Suitland (Md.) High School.

Success of the fair, stated Anthony Rodes, the project officer for the AAAA, set the stage for expansion of the competition to other regions in cooperation with Science Service, the organization that sponsors the National Science Fair-International.

Dr. Theodore W. Lashof, Chairman of Science Service in the Washington area, and Lewis Casner, President of the Washington Chapter of AAAA, worked in arranging for the fair.

EVERYONE WAS HAPPY, for an undisclosed reason, when Army Chief of Research and Development Lt Gen Dwight E. Beach and three of the four winners in the Army Aviation Association of America regional junior science fair in Washington, D.C., were snapped by the photographer. With him (left to right)are Marshall Curtis of Woodrow Wilson High School, Wesley J. Pouliot of Kenmore Junior High and John David Weston of Einstein High. The fourth winner (not shown) was Terry Dawson of Suitland H. S., Md.

R&D Leaders Consider System Development, In-House Labs

How to improve methods for analysis and assessment of proposed system development, and also to increase capabilities of Army in-house laboratories, ocupied attention of more than 100 Army R&D leaders at the First Commanders and Technical Directors Conference.

Held at the U.S. Army Combat Developments Experimentation Center, Fort Ord, Calif., May 1-3, the parley was sponsored by Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen and Chief of R&D Lt Gen Dwight E. Beach. It initiated a broadening of the scope of the former Army Key Scientists meetings.

The program reflected recent policy statements by President Kennedy and other high Government leaders that greater emphasis should be devoted to increasing the overall competence of Government in-house laboratories.

Director of Defense Research and Engineering Dr. Harold Brown, the banquet speaker, pointed out the potential for leadership and objectivity which Government in-house laboratories can achieve, and discussed problem areas.

Dr. Larsen made the opening address, in which he commented on the growth in more harmonious, understanding and cooperative relationships between the industrial and the military scientific communities. As a result, he said, the Nation's defense structure and research and development activities, in general, are progressing notably.

"The main objective of this conference and of all military research and development," Dr. Larsen pointed out, "is to seek the means of getting the finest materiel possible into the hands of our soldiers in the shortest practicable time, at lowest feasible cost."

BETWEEN SESSIONS of the First Commanders and Technical Directors Conference, Brig Gen James W. Sutherland, Jr. (left), Commander, U.S. Army Combat Developments Experimentation Center, poses with Army R&D leaders, Maj Gen Chester W. Clark, Director of Army Research, Dr. Richard A. Weiss, Deputy and Scientific Director of Army Research, and Dr. Finn J. Larsen, Assistant Secretary of the Army for Research and Development.

Director of Army Research Maj Gen C. W. Clark made introductory and closing remarks on behalf of Lt Gen Beach, who had a prior commitment to participate in the worldwide major commanders conference in Washington, D.C.

An insight into U.S. Navy policies and procedures on research and development was provided by Dr. Gregory K. Hartmann, Technical Director, Naval Ordnance Laboratory.

Deputy and Scientific Director Dr. Richard A. Weiss, U.S. Army Research Office, under whose direction the conference was arranged, presided as general chairman. Host for the meeting was Brig Gen James W. Sutherland, Jr., commander of the Combat Developments Center.

Col Roy V. Porter, Director of Plans and Programs, Office of the Chief of Research and Development, led a panel presentation on "Program Formulation." Other participants included Col C. G. Metcalfe, Comptroller, Combat Developments Command, and Dr. Craig M. Crenshaw, Chief Scientist, U.S. Army Materiel Command.

"Career Development" was discussed by Billy M. Horton, Technical Director, Harry Diamond Laboratories, Washington, D.C.; "Post Doctoral Training" by Dr. Riley D. Housewright, Scientific Director, Biological Laboratories, Fort Detrick, Md.; and "Use of Director's Fund" by Dr. Cecil D. Fawcett, Frankford Arsenal, Philadelphia, Pa. Dr. Weiss spoke on "Career Mobility."

Panel discussions considered five subjects. Dr. Clifford G. Quarles, Chief Scientific Adviser, Office of the Chief of Engineers, Washington, D.C., led the group on "Career Development." Group leaders included:

"Quality Measurement," Brig Gen Walter E. Lotz, Jr., deputy command-

Dr. Harold Brown, Director of Defense Research and Engineering, is greeted upon arrival for Commanders and Technical Directors Conference, by Brig Gen James W. Sutherland, Jr., Commander, USACDC Experimentation Center. At center is General Sutherland's aide-de-camp, 1st Lt Ronald E. Mayhew and at right, Dr. William C. Pettijohn, Director, CDEC Research Office.

er, U.S. Army Electronics Command, Fort Monmouth, N.J.; "Laboratories Independent Research Fund," Robert M. Schwartz, Director of Development, U.S. Army Munitions Command, Dover, N.J.; "Flexibility of Operations," Col Rex H. White, Jr., Director of Research and Development," U.S. Army Mobility Command, Warren, Mich.; and "Recruitment," Dr. Marion B. Sulzberger, Technical Director, Medical Research and Development Command, Washington, D.C.

Other Office of the Chief of Research and Development leaders who took part in the discussions included: Col Andrew A. Aines, Director of Army Technical Information and Chief of the Scientific and Technical Information Division; Dr. Lynn E. Baker, Chief Psychologist, Human Factors and Operations Research Division; Dr. I. R. Hershner, Chief, Physical Sciences Division; Dr. Carl Lamanna, Deputy Chief, Life Sciences Division; Lt Col Richard G. Terwilliger, Environmental Sciences.

Orientations on current experiments and methods used in the Combat Developments Command Experimentation Center were presented by General Sutherland, Dr. William C. Pettijohn, Director of the CDEC Research Office, and by Project Chiefs of CDEC.

Conferees toured experimentation sites on the 250,000-acre field laboratory, viewing operations of an Infantry Battalion in a toxic environment, facilities of an air evacuation center, and a demonstration of capabilities of helicopters and fixed-wing aircraft.

Col John H. Kerkering, Commander, USAERDL, Fort Belvoir, Va., and Col Carl C. Edmondson, Commander of CDEC's 194th Armored Brigade, discuss field operations while other conference members observe display.

Col Smith Heads U.S. Army R&D Office in Australia

Establishment in Australia of a U.S. Army Research and Development Office, under the command of Chief of Research and Development Lt Gen Dwight E. Beach, became effective May 2.

Designated as a Class II activity, with Col Vallard C. Smith as Commanding Officer, the new facility is located at Canberra, Australia.

Col Smith is presently assigned with the Air Defense Artillery Command, China. As Senior U.S. Army Standardization Representative to Australia and Research and Development Liaison Officer of the group, he will join the Canberra office in July.

The mission of the new activity is to act as liaison between Headquarters, Department of the Army, other U.S. Department of Defense agencies, and Australian research and development activities and institutions performing work of military interest.

The office represents U.S. Army agencies in connection with materiel and nonmateriel standardization, data and research projects exchange, cooperative testing, and is responsible for processing U.S. Army and Australian requests for the interchange of equipment.

Under terms of the Basic Standardization Agreement between Armies, office accommodations and clerical assistance are provided the office by the Australian Army. Administrative support is provided by the U.S. Embassy, Canberra.

The activity is under supervision of Director of Developments, Brig Gen Allen D. Hulse, OCRD. Responsibility for provision of policy guidance and transmittal of instructions is assigned to Col Ned T. Norris, Chief, International Division, OCRD.

Col Vallard C. Smith

SARS Fellow Theorizes On Earth Magnetic Field

Dr. Richard J. Weiss, Basic Research Laboratories, U.S. Army Materials Research Agency, Watertown (Mass.) Arsenal, recently published a letter in *Nature* in which he proposes a new theory of the origin of the Earth's magnetic field.

Dr. Weiss is currently working under a Secretary of the Army Fellowship as guest of the Department of Mathematics, Imperial College, London, and will return in September.

The core of the Earth is predominantly iron and appears to consist of an inner, high-density sphere about 1,700 miles in diameter surrounded by a liquid, outer layer. The temperature at the beginning of the inner core is estimated to be 6,700° F., and the pressure, 48 million pounds per square inch. The specific gravity of the inner core is 15.2 (twice that of ordinary iron) while that of the outer core is 11.5.

To explain these facts and the magnetism exhibited by the whole Earth, Dr. Weiss has proposed that the inner core may consist of a highly compressed, solid phase of iron in which the electrons no longer occupy their usual positions.

The Curie temperature of ordinary iron, the temperature above which it is no longer ferro-magnetic, is 1,418° F. Dr. Weiss has calculated for the predicted phase a Curie temperature of 9,400° F., well above the estimated core temperature.

As a corollary to these ideas, he suggests that if other planets contain cores similar in composition to that of the Earth, only those of an approximately equal or larger weight could develop sufficient pressure to create the new magnetic phase. He would expect no magnetic field to be exhibited by Mercury, Mars, Venus and the Moon, but would expect magnetic fields about Uranus, Neptune, Saturn and Jupiter.

Dr. Weiss suggests further that with the rapid advance in high pressure techniques achieved in the laboratory, it may become feasible in the next decade to look for the predicted high-pressure, magnetic phase of iron.

Lt Gen Gavin Heads AUSA

Lt Gen James M. Gavin (USA, Ret), former Army Chief of Research and Development and Ambassador to France, has been elected president of the Association of the U.S. Army, effective June 14.

USAELRDL Hosts World's Largest Power Sources Meeting

The 17th Annual Power Sources Conference held in Atlantic City, N.J., May 21-23, under the sponsorship of the U.S. Army Electronics Research and Development Laboratory (USAELRDL), Fort Monmouth, attracted about 1,000 representatives of Government and industry.

The conference, the largest of its kind, included sessions on solar energy conversion, thermal energy conversion, fuel cell batteries, secondary batteries, primary batteries, and electrical-to-electrical conversion. Col James M. Kimbrough, Jr., USAELRDL commander, addressed the conference banquet.

A panel discussion on "The Future of Fuel Cells," was moderated by David Linden, USAELRDL. Papers were presented by: G. C. Szego, Institute for Defense Analysis; H. Hunger, USAELRDL; B. C. Almaula, U.S. Army Engineer R&D Laboratory; B. B. Rosenbaum, U.S. Navy; G. E. Starkey, U.S. Air Force; Ernst M. Cohn, NASA; N. Cochran, Department of the Interior.

Col R. K. Saxe of the U.S. Army Electronics Command chaired a session on Solar Energy Conversion. Among the speakers was George Hunrath, USAELRDL, who discussed its use in remote areas for locator beacons, small weather stations, battery charging and as a supplemental or emergency source of power.

For use on a global basis, he said, the design of a solar photovoltaic energy converter should be of the modular, expansible type that provides a means for adding or removing modules of solar cells to obtain the required output from the solar energy available in a given location.

J. Werth, General Motors Corp., reported on investigations covering several aspects of thermo-photovoltaic energy conversion. Germanium and silicon photocells, powered from a propane-filled silicon carbide radiator, were used in what is believed to be the first experimental generation of a usable quantity of thermo-photovoltaic power.

A dozen radio receivers were operated simultaneously and with ease, even under conditions of gross spectral mismatch. With the radiator temperature reduced to 1200° C., and the germanium cells replaced by silicon, adequate power for the receivers could be derived from less than 3 cm^2 of effective cell area.

The investigations showed that selective reflection as a method of matching germanium cells to a gray body radiation operating at a surface temperature of 1400° C. or less, has a potential relative spectral efficiency of about 70 percent.

During the Thermal Energy Conversion Session, which was chaired by Lt Col G. H. Ogburn, U.S. Atomic Energy Commission, H. R. Hazard of Battelle Memorial Institute, reported on combustion systems using solid fuels such as wood, charcoal, coal, coke, animal dung and grain, for use in generating electric power in isolated regions with limited logistics.

F. J. Lyczko, Thermo Electron Engineering Corp., and C. Teleki, General Instrument Co., reported on further progress in their respective programs to develop 45-watt thermal energy conversion units.

J. Angello, USAELRDL, in his presentation on AC thermionic converters, reported that a single thermionic diode, high-voltage power source, using an unsymmetrical wave form generator, appears more promising at this time than a multi-diode system. At the present state-of-the-art, the cost of a thermionic diode is high and its reliability is still relatively low.

The Fuel Cell Batteries Session was conducted by Dr. E. G. Baars, USAELRDL. B. S. Baker, Institute of Gas Technology, reported on work directed toward the development of a natural gas fuel cell. New concepts in electrode development have resulted in a fuel cell system of the molten salt type which has demonstrated substantial operating lifetimes and a practical multiple cell battery design. Significant achievements in the high-temperature fuel cell area have been demonstrated.

H. H. Geissler, Engelhard Industries, described a hydrogen generator designed to supply a 200-watt fuel cell power package with this quantity of hydrogen for a period of 12 hours from ammonia or conventional liquid fuels.

The apparatus would have a total weight, including fuel, of less than 15 pounds and a volume of less than two cubic feet. Although the development of cells using these conventional fuels directly appears to be promising, such cells may not be available for practical applications in the near future; therefore, there is an appreciable interest in a convenient source of pure hydrogen for fuel.

H. Silverman, Magna Corp., discussed the urea biological anode as it pertains to biological fuel cells. The urea fuel anode uses a biological agent as a catalyst to convert urea to ammonia and carbon dioxide. The ammonia is then oxidized electrochemically. The urea-ammonia electrode is capable of supporting current densities of the order of 3 ma/cm^2. This result was obtained using conventional approaches with optimum environmental conditions.

Biological fuels were classified by M. Shaw, Electric Autolite Co., as primary, secondary, or tertiary. Primary fuels are high-energy-level compounds existing in their natural state prior to intermediary metabolism; secondary fuels are high energy level fuels resulting from the hydrolysis of primary fuels; the tertiary fuels are those intermediate or low energy level fuels obtained from primary or secondary fuels by partial oxidation of other metabolic processes.

During the session on Secondary Batteries, chaired by Maj A. Fitch, U.S. Air Force, about one-half of the papers concerned nickel-cadmium batteries. B. Resnic, USAELRDL, reported on investigations and data analysis to establish optimum charging methods for sealed nickel-cadmium batteries for various ambient and initial battery conditions.

To eliminate the more than 5,000 individual tests that would be required to conduct this inquiry in the conventional manner of studying the experimental factors, and to reduce uncontrolled variations of results that are the experimental errors, full use is being made of statistically designed experiments.

The entire program plans for detailed investigations of the constant current, constant potential and pulse charging techniques. Effects of temperature, state of charge, charge time, overcharge, cell type and discharge rate are a few of the factors under consideration.

J. J. Lander, General Motors Corp., presented data to show that the zinc-silver oxide battery is capable of sealed operation for hundreds of cycles when internal pressure build-up is controlled by limiting voltage.

Operation in this fashion is possible because Faradaic efficiencies for plate material utilization approaching 100 percent can be achieved. These data, although limited in testing scope in terms of cycle depth, temperature range, and time per cycle, provide a base line for performance of this system and disclose areas for research and development

to achieve increased performance.

The Primary Battery Session was chaired by J. M. Hovendon, USAELRDL. H. R. Knapp, USAELRDL, stated that magnesium perchlorate electrolyte has several advantages over the electrolytes normally used in magnesium batteries. The mercuric oxide system showed a higher cell voltage and produced greater cathode efficiency than other systems.

Magnesium perchlorate reserve batteries give energy outputs of 50-55 watt/hours per pound from 30-minute to 30-hour rates at room temperatures and, with good battery insulation, over 40 watt/hours per pound at —50° C.

These batteries activate rapidly when put on load for meteorological applications as opposed to conventional activated systems which require a 10-minute drain period to reach serviceable voltage. Activated shelf life of one week is obtainable with use of the proper Mg alloy anodes.

D. L. Warburton, Naval Ordnance Laboratory, reported on a Leclanche battery shelf life study. Approximately 37,000 specimens of batteries and associated cells, manufactured during the period from 1950 to 1957 were put in storage at various temperatures for periods up to 14 years.

These studies revealed that the temperature of —34° C. is a safe and effective storage temperature when the batteries are heat sealed in 100-micron-thick polyethylene bags. The shelf loss at 21° C. is reduced by approximately one order of magnitude by storage at —34° C.

J. L. Robinson, Dow Chemical Co., in his presentation, stated that although various magnesium primary cell systems exhibit high capacities and outstanding shelf life, the magnesium is delivering only about 700 of its inherent 2,500 watt hours of energy per pound when referred to the standard hydrogen electrode; therefore, a study was made to explore the possibility of increasing the usable portion of available energy.

Observed anodic behaviors strongly suggest that the electrode processes are film controlled, and despite the high degree of order observed, the governing reactions in the anodic behavior have not been clearly defined. It has been demonstrated that the coulombic inefficiency of magnesium can be eliminated in an operating system, which means substantially improved primary cells are possible.

(Continued on page 12)

NATO Special Working Group on Power Sources Sets Standardization Goal

NATO Special Working Group on Electrical Power Sources is greeted at USAELRDL by Lab Commander, Col James M. Kimbrough, Jr. Left to right are: Arthur F. Daniel, U.S.; Frederick Cyril Butler Smith, United Kingdom; Henning Vaga Jakobsen, Denmark; Frederick Bernard Bamberg, the Netherlands; Jean Tayssere, France; Col Kimbrough; Rene DeBlache, France; Bent Okholm, Denmark; Dr. H. Maschke and Max Pohler, Republic of Germany.

Complete standardization of all nonrotating electrical power sources for the western Alliance's armed forces is the aim of the NATO Special Working Group on Electrical Power Sources that met at Fort Monmouth, May 27-31.

Seven NATO nations—the U.S., Canada, Denmark, France, Germany, the Netherlands and the United Kingdom are represented on the 12-man group, whose eighth annual meeting here was the first such session held outside NATO headquarters in Paris.

The Group came to the United States at the suggestion of Arthur F. Daniel, U.S. member and Director of the Power Sources Division, U.S. Army Electronics Research and Development Laboratory. He suggested the U.S. meeting so that the members could attend the Laboratory's 17th Annual Power Source Conference—world's largest electrical power sources meeting—held in Atlantic City one week earlier.

Already achieved is a standardization agreement on primary battery dry cells. This agreement is now going through the process of ratification by all NATO governments. Final agreement is near on an agreement for lead-acid secondary batteries.

The working group reports that progress is being made in agreements on mercury and zinc silver-oxide primary cells and nickel-cadmium, zinc silver-oxide and silver-cadmium secondary batteries.

Part of a long-range plan to standardize all military equipment for NATO nations, the Electrical Power Sources unit hopes eventually that it can achieve complete interchangeability of batteries and other power sources in all member nations' electrical and electronic equipment.

The group also is working on standard nomenclature, based for the most part on that already in use in the United States.

The group's meetings also afforded an opportunity for international exchange of research and development information, particularly in the fields of nonbattery power sources such as thermo-electric, thermionic, fuel and solar cells.

Members of the group, in addition to Mr. Daniel, are Rene Deblache, France, Chairman; Bent Okholm, Denmark, Secretary; H. D. Adam, R. Thomas Elston King and Geoffrey Cocombe Rowe, all of Canada; Henning Vaga Jakobsen, Denmark; Jean Tayssere, France; Dr. H. Maschke and Max Pohler, Germany; Frederik Bernard Bamberg, The Netherlands, and Frederick Cyril Butler Smith, United Kingdom.

Ft. Detrick Dedicates Biomathematics Center, New Computing System

Fort Detrick, Md., dedicated on May 16 a new Biomathematics Center and a newly installed UNIVAC Solid-State Computing System.

A plaque marking the official opening of the Center was unveiled jointly by Maj Gen Frank H. Britton, Director of Research and Development, U.S. Army Materiel Command, and Brig Gen Fred J. Delmore, commander of the Chemical-Biological Agency, Edgewood, Md.

"With the opening of our new Biomathematical Center," stated Detrick commander Lt Col Martin F. Massoglia, "an important cog has been added to the ever-increasing ability of the U.S. Army Biological Laboratories to accomplish their vital mission in national defense."

Design and analysis of biological experiments, it was stated, will be speeded tremendously by the new UNIVAC system, "saving valuable time for the investigator and possibly precluding duplication of effort."

General Delmore termed the Center and computer a "valuable tool in the hands of scientists for providing the soldier in the field with the latest and best equipment in the least amount of time." As a result, he said, lead time in development of new combat items should be cut greatly.

Leland Johnson, Vice President of UNIVAC Division, Sperry Rand Corp., told of new concepts being developed by manufacturers of data processing equipment which may lead to linking of systems in different locations for rapid exchange of information.

Standing before plaque at new Biomathematics Center, Fort Detrick, Md., are (l. to r.) Lt Col Martin F. Massoglia, CO, Fort Detrick; Maj Gen Frank H. Britton, Director, R&D, USAMC; Brig Gen Fred J. Delmore, CG, CBR Agency, Edgewood, Md.; Dr. William W. Dorrell, Director of Technical Services, Fort Detrick; and Mayor E. Paul Magaha of Frederick, Md.

Dr. Walter Foster, Chief of the Biomathematics Division, conducted a briefing tour of the Center and the computing equipment. Guests were:

Mayor E. Paul Magaha of Frederick, Md.; Dr. I. R. Hershner, Chairman of the Army Mathematics Steering Committee and Chief, Physical Sciences Division, U.S. Army Research Office; Dr. Clyde Kramer, Virginia Polytechnic Institute; Norman Kline, U.S. Army Materiel Command;

Dr. Clifford Maloney, National Institutes of Health; James Hannon, U.S. Army Munitions Command; Dr. Chester McCall, Director of Mathematics, and Dr. George Shortly, Scientific Research Director, Booz Allen Applied Research, Inc.

Gerald T. Eccles, Chief, Numerical Analysis Branch, explains an operation at the control panel of new UNIVAC II system to Dr. William W. Dorrell, Director of Technical Services, center, and Dr. Walter D. Foster, Chief, Biomathematics Div.

USAELRDL Hosts Power Sources Meet

(Continued from page 11)

A session on Electrical Energy Conversion was chaired by J. Kaufman of the U.S. Army Materiel Command. J. T. Lingle, Minneapolis-Honeywell Regulator Co., reported on progress in the area of low-input voltage conversion.

Use of a single, large-capacity, low-voltage power source coupled to a low-input d.c. to a.c. converter, he said, can convert the output of the single cell to one or more usable output voltages.

Low-input voltage converter and inverter systems can be designed to adapt a single standard power source to many applications by providing various a.c. and d.c. outputs with optional voltage and frequency regulations. Practical voltage conversion of common chemical battery sources as well as the direct energy conversion devices is feasible.

W. Dudley, USAELRDL, presented a paper that covered the initial phase of an investigation to convert the low-voltage output of a single diode thermionic converter to 6v, 12v or 24v d.c.

A single-ended control circuit is being investigated, he said, for switching one thermionic diode between conducting and non-conducting states in an symmetrical fashion to produce an a.c. voltage in order to increase the a.c. overall system efficiency from the heat input to the power used by the load.

In comparison with a two-diode push-pull inverter, this system has the advantages of lower fuel requirement, greater reliability, fewer expensive parts, reduced size and weight.

Feltman Research Labs Pick Chief of Concepts Section

John W. Gregorits, newly elected second vice president of the Essex County Society of Professional Engineers, is Chief of the Advanced Concepts Section in the Feltman Research Laboratories at Picatinny Arsenal, Dover, N.J.

Employed at the Army installation for the past five years, he earned his masters degree in mechanical engineering last year from Newark College of Engineering.

The Essex County group, with an enrollment of over 500 registered engineers, is affiliated with the National Society of Professional Engineers.

Dr. Weiss Selected to Attend National War College

Deputy and Scientific Director Dr. Richard A. Weiss, U.S. Army Research Office, Office of the Chief of Research and Development, has been granted a leave of absence to attend a 10-month National War College course. He will begin his studies at the Washington institution Aug. 15.

Honored in 1959 by the National Civil Service League as one of the top 10 career employees in the Federal Government, Dr. Weiss was selected to attend the National War College course designed to develop personnel for high executive duties.

The scope of NWC studies includes:

- Analysis of the nature and interdependence of the several factors of national power of the United States and other nations.
- Study of the integration of military and foreign policy.
- Study of the role of the United Nations and other means designed to avoid armed conflict between nations.
- Determination of the influence of the possession or deficiency of economic, scientific, political, psychological and social resources upon national security.

Dr. Weiss has been a Federal career employee for 22 years and in 1955 became Scientific Adviser to the Director of Research, Office of the Chief of Research and Development.

Dr. Richard A. Weiss

In 1957 he was promoted to Acting Chief Scientist and a year later assumed his present position with the U.S. Army Research Office.

Progressive development for leadership responsibilities started in 1941 when he entered Government service with the Army Signal Corps at Fort Monmouth, N.J. For the next eight years he served in a number of supervisory capacities and personally engaged in research on thermal detectors for military operations, the detection problem of thin films, and various aspects of improving night combat capabilities.

From January 1949 to December 1952 he was Chief of the Nucleonics Branch, Evans Signal Laboratory at Fort Monmouth, and then served three years as Director of the Physical Sciences Division. He was a scientific consultant to the U.S. Army Signal Corps for the first A-bomb test team at Bikini Atoll in 1946 (Operation Crossroads) and an adviser for Operation Greenhouse during the Eniwetok Tests in 1951.

Planning and technical direction of Signal Corps participation in tests at both the Pacific and Nevada Proving Grounds was his responsibility from their inception until 1954.

He was a member of two joint survey teams, one to Japan in 1959 which led to the formulation of the U.S. Army Research Office in Japan and the other to South America for the purpose of surveying the potential for a science office that was established in Rio de Janeiro, Brazil, in 1962. He has been a representative of the U.S. Army Research Office in many international conferences, and has served on a number of Department of Defense and Tripartite (American-British-Canadian) advisory and consultative committees.

Dr. Weiss obtained M.A. and Ph. D. degrees in physics from the University of Virginia (1938 and 1940), a B.S. degree from Randolph-Macon College in Virginia, and began his scientific education at Brooklyn Polytechnic Institute, Brooklyn, N.Y.

ASAP Executive Secretary Assigned to Germany

Lt Col Paul D. MacGarvey, for the past three years Executive Secretary, Army Scientific Advisory Panel, Office of the Chief of Research and Development, will leave in July to take over as Commander, 3rd Battalion, 32nd Armor, 24th Infantry, Munich, Germany.

Assigned to OCRD in 1959 following graduation from Command and Staff Course of the Naval War College, he served initially as staff officer in the Research Support Division, U.S. Army Research Office.

Commissioned in 1942, he served during World War II with the 33rd Armored Regiment, 3rd Armored Division, and was awarded the Bronze Star Medal for valor.

During the Korean War he was again decorated for his service as tank company commander, Battalion S-3 and with the 70th Heavy Tank Battalion. In addition to the coveted "V," his Bronze Star ribbon bears three oak leaf clusters.

He has served 3-year tours on the staff and faculty of the Armored School, Fort Knox, Ky., and as a Tactical and Technical Member, Army Field Forces Board No. 2.

Other recent assignments include Tank Battalion Executive Officer, 67th Tank Battalion and G-3, Training Section, Hq., V Corps, both with U.S. Army, Europe.

Lt Col Paul D. MacGarvey

3 Study Contracts Awarded For New Air Defense System

Studies in the technical feasibility of a new field Army air defense system form the basis of contracts awarded recently by the Army to three contractor-subcontractor teams selected from seven bidders.

Still in the early planning stage, the AADS-70's (Army Air Defense System for the 1970's) will be designed to supplement or selectively replace some of the existing air defense systems, with emphasis on countering anticipated missile threats.

Recipients of the half-million dollar study contracts are Raytheon Co., Bedford, Mass., Hughes Aircraft Co., Fullerton, Calif., and the Radio Corporation of America, Camden, N.J.

Studies are to be completed by mid-September and submitted to the Army Missile Command, Redstone Arsenal, Ala., for evaluation.

Ralph E. Hopkins | Dr. James I. Bryant | William R. Eason | Cyrus A. Martin | Pfc (E-3) J. A. Morales

Engineer R&D Labs Nominate 11 for 1963 Achievement, Leadership Awards

Ralph E. Hursey

Max P. Whitford

William H. Deavers

Ten civilian employees and one enlisted man have been nominated for the Commanding Officer's Technological Achievement and Leadership Medals awarded annually by the U.S. Army Mobility Command's Engineer Research and Development Laboratories, Fort Belvoir, Va.

The medals, the two highest awards originating within the Laboratories, are presented to a scientist-engineer who has been adjudged to have made the most significant technical achievement, and to a supervisor who has shown outstanding leadership. Nominations are made by the Laboratories.

The winners, to be selected by the Commanding Officer and his staff, will be announced at an awards banquet June 20.

Nominees for the Technological Achievement Medal are Ralph E. Hopkins, Dr. James I. Bryant, William R. Eason, Cyrus A. Martin and Pfc (E-3) J. A. Morales.

Leadership Medal nominees are Charles F. Cashell, Francis B. Paca, Joseph H. Sullivan, Ralph E. Hursey, Max P. Whitford and William H. Deavers.

The first enlisted man ever nominated in the 6-year history of the awards, Pfc Morales was selected on the basis of his development of the ignition circuitry for the Xenon searchlight for tanks. Providing instant starting of the light upon application of power, it operates from the tank's electrical system at wide ranges of temperatures.

Morales based his ignition circuitry on the advanced use of power junction transistors, xener diodes and solid-state electronic relays, as well as some of the more conventional solid-state circuitry. In less than two months, the Engineering Department nominee had completed the design for the circuitry and had a prototype fabricated.

Hopkins has been nominated by the Electrical Department for his achievements in the field of ultra high-speed, high-frequency electrical motors and generators, and the control techniques for these machines. A superior said the radically advanced concept in electrical propulsion of ground vehicles offers heretofore unachievable gains in performance and payload.

Pioneer work using vibrational spectroscopic techniques in the field of molecular spectroscopy and structure of azides won for Dr. Bryant the Military Department nomination. His work provides a means of investigating, through spectroscopy, the structure and vibrational energies of the more complex heavy metal azides such as lead and silver azides.

Eason's achievements have been in the development of engine accessories, particularly electrical and governing systems. The Mechanical Department nominee has developed a 24-volt alternator incorporated in the rope starter pulley on 6, 10 and 20 hp. Military Standard engines. Eliminating the separate belt-driven

Joseph H. Sullivan

Francis B. Paca

Charles H. Cashell

generators, it provides higher charging rates, reduces weight and cost.

Eason also has developed a low-cost throw-away type magneto for military engines, and a lightweight 24-volt battery of comparable weight and size to the present 12-volt battery. In addition, he has evolved and proposed a new criteria "Voltage Rise Time" for use in the design and evaluation of ignition systems.

Martin, nominated by the Technical Service Department, has developed an operational method of minimizing the quantities of inspection required for assurance sampling processes. An algebraic and graphical model he designed allows the engineer or manager to select and specify a minimum cost inspection plan (or set of plans) based on costs of inspection, costs associated with not inspecting, and the history capabilities of the contractor, producer, or item lot.

In the Leadership competition, Cashell was nominated for his work as Assistant Chief of the Electrical Department. Sullivan was the Mechanical Department choice for his planning, management and supervision of an important classified project.

Paca, Military Department, was named for his work in organizing military and a diversity of scientific talent in research and development on strategic and tactical barrier systems. Hursey's supervision and direction of the development of heating and air conditioning equipment for the Pershing missile system won him Engineering Department nomination.

Whitford was chosen by Technical Service for his efforts in operating the Environmental Research Laboratory at peak efficiency on a 3-shift basis. Deavers' nomination by Logistic Services resulted from his supervision of facilities work, including installation of new equipment for the Warfare Vision Branch and the Basic Research Group.

Hearn Retires After 30 Years Service With CE

Chauncey M. Hearn ended 30 years of service with the Army Corps of Engineers May 20 when he retired as Assistant Chief of the Engineering Division, Civil Works, Office of the Chief of Engineers, a position he held 16 years.

Lt Gen W. K. Wilson, Jr., Chief of Engineers, honored him at a retirement ceremony by presenting him with the Department of the Army Decoration for Meritorious Civilian Service, the Army's second highest award for employees.

In recognition of World War II service, during which he spent five years overseas, principally in the Persian Gulf Command, he was awarded the Legion of Merit. He retired from active duty as a colonel in the Corps of Engineers.

As Assistant Chief of the Civil Works Engineering Division, Hearn was concerned with management of a nationwide water resources development program, designing river and harbor flood control construction, and many additional projects currently involving expenditure of over $1 billion annually.

Graduated from Case Institute of Technology in 1926 with a B.S. degree in civil engineering, he was active in construction and design of industrial projects and highways before joining the Corps of Engineers. He is a registered Professional Engineer, a member of the National Society of Professional Engineers, the American Society of Civil Engineers, Society of American Military Engineers, and Sigma Alpha Epsilon.

Maj Gen Robert G. MacDonnell Deputy Chief of Engineers, congratulates Chauncey M. Hearn upon retirement after 30 years service with OCE.

Niles Retires After 39 Years Government Service

Norman E. Niles retired recently at the U.S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Md., after 39 years of civilian and military service.

As Chief of CRDL's Graphic Arts Branch, he was a key figure in the development of the Laboratories' modern motion picture research and development film report program.

A Chemical Corps Reserve officer since 1930, he assumed active duty status in 1941 and headed the Tactical Doctrine Branch of the Training Division at Edgewood Arsenal, an element of the Office of the Chief of the Chemical Warfare Service.

The Branch helped train 10 million men in chemical operations through training films, film strips, graphic training aids, field manuals, technical manuals, and other media.

Awarded the Army Commendation Medal for his wartime service, he began active duty as a second lieutenant and rose to lieutenant colonel.

Norman E. Niles

Dr. de Percin Rejoins USARO as Branch Chief

Dr. Fernand P. de Percin has rejoined the staff of the U.S. Army Research Office (USARO) as Chief of the Special Projects Branch, Environmental Sciences Division.

From April 1960 to September 1961 he was a Polar Research Specialist in the same division. He returns to USARO from almost two years with the National Science Foundation as an Associate Program Director in the physical sciences.

After receiving his B.S. degree in physics and mathematics from Rutgers University in 1943, he entered the U.S. Army Air Corps as a weather officer. Following World War II he earned his M.S. degree in meteorology and climatology at the California Institute of Technology and taught for a year at the Pennsylvania State University.

In 1948 he entered Federal service as a meteorologist with the Quartermaster Research and Development Field Office, Cameron Station, Va., serving as head of the Office until 1953. For the next seven years he served as Chief of the Polar Section and then of the Regional Branch at the Quartermaster Research and Engineering Command, Natick, Mass.

He has published approximately 30 research articles in trade journals.

McNamara Tells DIAC Hope of More Profits Hinges on Improved Efficiency

Industry's goal of increased profits should be linked to improved efficiency in defense contracts through incentive award provisions, Secretary of Defense Robert S. McNamara told the Defense Industry Advisory Council at its third meeting in Washington.

Secretary McNamara made the opening address at the May 3-4 meeting in the Pentagon, expressing his deep appreciation for the membership's valuable contribution to Defense policy formulation as it concerns relationships with industry.

A continued healthy Defense supplier community is essential, he said, to maintaining combat readiness in an era of rapidly changing concepts of strategy, involving a corresponding rapid obsolescence in materiel.

Indicative of Secretary McNamara's industry profits philosophy was his recent testimony before the Senate Armed Services Committee when he stated:

". . . We hope to see the profits of efficiently run Defense producers increase. In my personal opinion, they are too low at the present time. But if they are to increase, they must increase by increases in efficiency."

Action was taken at the DIAC conference to implement five of the ten items on the agenda and to carry the others over for further discussion at future DIAC meetings.

The Chairman, Deputy Secretary of Defense Roswell L. Gilpatric, added a new item when he proposed that a joint Defense-Labor-Industry study be undertaken on the probable impact of possible future arms control measures on industry and the economy.

Although U.S. industry successfully weathered the abrupt changeover from war to peacetime operations following World War II, Gilpatric stated, the weapons systems of today present totally new, difficult problems.

Walter Carlson, Director of Technical Information, DDR&E, discussed the Department's proposal for classified briefings of industry on future research and development plans. He stressed that while many briefings are now conducted by the Military Departments, the tendency is toward proliferation.

Subject matter, he said, should be narrowed down and an appropriate forum be chosen for inter-service participation where feasible. The proposal was endorsed by the Council and its terms will be put into effect by a new Defense directive.

Robert Lyons, Director of Procurement and Management, reported on plans developed by a DIAC subgroup on Joint Industry-Defense training of Procurement Personnel.

A questionnaire is being responded to by the Defense industry to determine the extent of training now provided by industry in Defense procurement and related matters, and to determine interest and areas where more joint training would foster better understanding and achieve greater uniformity of interpretation.

Arrangements have also been made to have three industry representatives attend the next offering of the DoD-sponsored Advance Procurement Management course in June and to critique this experience for the DIAC.

Preliminary plans for a joint Industry - Defense Procurement/Technical Conference to be held this fall were also outlined. Developments will be reported at the next DIAC meeting.

Assistant Secretary of Defense (I&L) Thomas Morris and Deputy Assistant Secretary Graeme Bannerman discussed Fundamental Issues Affecting Defense-Industry Relationships. Sixteen areas of consideration were reviewed, and the Council agreed that great progress had been made in identifying problem areas.

This long-term item will continue on the Council's agenda and each of the problem areas will be discussed in detail at future meetings of the Council, following further study and development by teams composed of industry and Government leaders.

A review of the subcommittee's efforts to date on Current Incentive Contracting Practices was presented, identifying, for further in-depth consideration, controls normally applied to cost type contracts which could be relaxed or rescinded in incentive type agreements. The subcommittee will continue its exploration of the problem and a fuller presentation will be made at the next Council meeting.

DAS Bannerman also reported on the recommendations of the subgroup established to study the "weighted guidelines" approach to the negotiation of profit and fee. It was pointed out that there was much concern to this suggested approach initially by both Departmental and industry personnel, but that as some 500 field tests have demonstrated that a wider range of profits would result, much of this concern has disappeared.

Weighted guidelines, it was stressed, apply only to noncompetitive procurements where DoD is required by statute to obtain cost estimates, and relate only to targets and not the swings on incentive targets.

The Council approved the weighted guidelines concept as presented by the subgroup and agreed that the subcommittee, with the addition of a representative from small business, should continue to monitor the implementation of this program.

A report on a Code of Conduct for Organizations, applying to certain

Clifford J. Kalista (center right), supervisory application engineer of Bell Helicopter Co., Fort Worth, Tex., presents plaque to Col Robert B. Harrison, U.S. Army Transportation Board president, in honor of the men who landed the first UH-1B helicopters at the South Pole. Lt Charles W. Beaman (left) holds a replica of the helicopter. CWO Joe R. Griffin (right) is one of the members of the team. (For story, see March 1963 issue, page 36.)

contract conditions, was made by a DIAC subcommittee. Following a general discussion, it was agreed that a preamble stating general principles of what the Code is intended to accomplish and explaining certain key policies of the Department, as outlined by Secretary McNamara, should be issued, with the Code. This preamble statement will be considered by the subcommittee before the Department issues the Code.

The Council considered the problem of Source Selection in connection with large-scale Defense procurements, following a report of the subcommittee concerned with the matter. The committee reaffirmed its belief that the subject of Source Selection is of major importance to the Defense Department, to Defense industries and indeed to the Nation as a whole.

Many billions of dollars will be expended in the procurement of research, development, and operational equipment by the Defense Department during the next few years. It was emphasized that a significant percentage of these great costs will be needlessly absorbed in relatively unproductive efforts associated with bidding and source selection unless appropriate procedures and policies are formulated and utilized.

The consensus of the Council was to approve the work of the subcommittee and its chief recommendations. It is expected that the Defense Department will proceed to develop implementing detailed procedures and that these will be reviewed at a later date by the DIAC.

Proposed procedures developed by a DoD Task Force covering techniques for evaluating and recording contractor performance were discussed. The objective of the plan is to establish a permanent record of performance on large development contracts which will be available for reference in connection with the selection of contractors for future programs.

The elements of the plan were generally endorsed by the Council, with the recommendation that the procedures be reviewed with appropriate industry groups.

The subject of the Respective Roles of Government and Industry Pertaining to Systems Management was passed over for consideration at the next meeting of the Council.

The Council continued a discussion, started at its January meeting, regarding the respective roles of Government and industry in the performance of equipment maintenance.

DoD officials outlined steps being taken to re-examine, in depth, the standards of maintenance required for each major category of military equipment; and to make proper determinations of those maintenance activities which should be performed in-houses versus those which should be contracted out. The Council decided to establish a subgroup to work with DoD in continuing studies.

It was agreed that some weekend in September should be considered as a target date for the next meeting.

CDC Ordnance Agency at APG Marks Anniversary

The U.S. Army Combat Developments Command Ordnance Agency at Aberdeen Proving Ground, Md., recently observed its first anniversary.

Concerned with how Ordnance units should be organized, equipped and employed, the Agency provides long-range direction as well as materiel guidance, and tables of organization and equipment.

Eighty military and civilian personnel comprise the present strength of the Agency. There are 25 officers, 10 enlisted men and 45 civilians. Ten serve at the Redstone Arsenal Ordnance Guided Missile School.

Agency commander Col Edmund R. Urquhart commented:

"It was necessary to place early emphasis on establishing the working relationship with the materiel developing agencies of the U.S. Army Materiel Command and the Army Continental Army Command schools.

"After that, it was a job of carrying on with current doctrinal actions and yet at the same time delineating the direction to be followed in providing support in the future."

The colonel said the long-range nature of much of the work in which the Agency is engaged is such that its suggestions for changes will not occur for two or three years. He explained:

"We work with many agencies of the Army during the development of ideas. Then these ideas are forwarded to the Department of the Army for further consideration."

An outgrowth of Army reorganization in 1962, the Agency consolidates and centralizes certain former planning facilities.

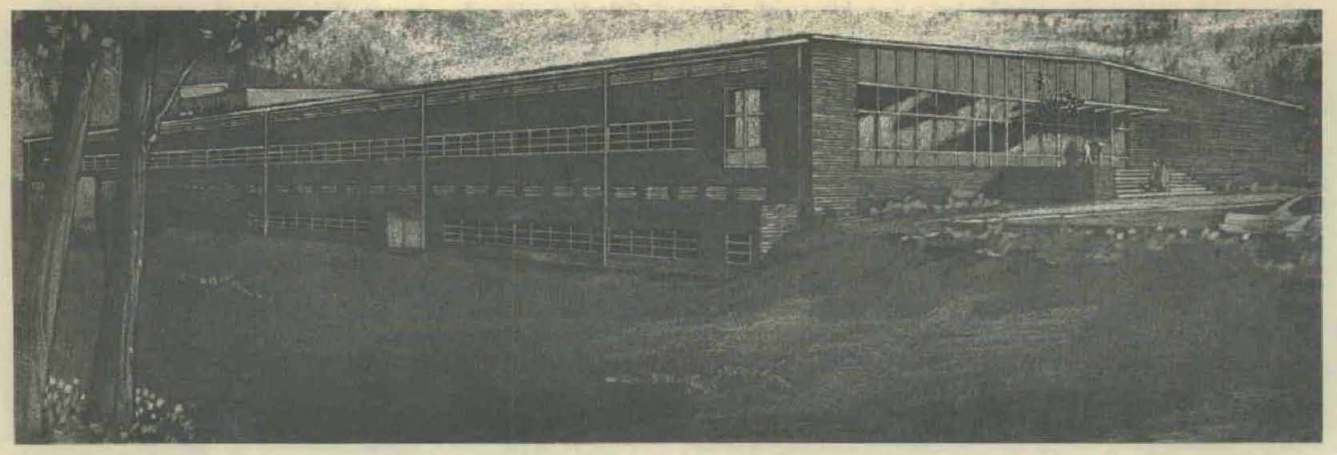
William E. Vaughan, executive assistant to Col Urquhart, said the Agency is one of several elements of the Combat Service Support Group, Fort Lee, Va. This group in turn, he said, reports to U.S. Army Combat Developments Command Headquarters, Fort Belvoir, Va.

Lt Col George Mearns is Acting Chief of the Concepts Division, which studies and formulates future concepts of organization. Col George P. Holm is Chief of the Organization and Doctrine Division which formulates and documents current doctrine pertaining to Ordnance materiel and units.

Col Herman O. Freeman is Chief of the Tools, Equipment and Test Division and is responsible for analyzing and establishing requirements for new tool sets in support of Ordnance materiel.

Paul Edwards heads the Administrative Division, which provides internal support of the Agency.

Col Edmond R. Urquhart (left), CO, U.S. Army Combat Developments Command Ordnance Agency, and William E. Vaughan, Executive Assistant, look over the shoulder of Pvt Edward T. Kenney, illustrator, at chart showing procedures used in Military Occupational Specialty Development.



Artist's drawing of U.S. Army ultramodern night vision research facility to be constructed at Fort Belvoir, Va.

Army Calls for Bids on Ultramodern Night Vision Laboratory

Sanitation standards far surpassing those of a Swiss watch factory will prevail in "clean rooms" of the U.S. Army ultramodern night vision research facility to be constructed at Fort Belvoir, Va., within the next 18 months. Bids on the $1.75 million building are to be opened this month.

Super cleanliness is essential to rigidly controlled conditions for experiments on three types of night viewing systems under development by the U.S. Army Mobility Command Engineer Research and Development Laboratories. These are infrared, image intensification and battlefield illumination.

All aimed at providing soldiers with "night sight" to move and shoot with ease and effectiveness under cover of darkness, the systems are linked to the mobile army concept. Troops able to move swiftly and surely at night are less vulnerable to enemy firepower.

Many novel features incorporated in the design of the building are the culmination of more than a year of intensive planning under the direction of Norfolk (Va.) District Army Engineers. Architects are Victor B. Spector Associates, Falls Church, Va.

All utility and service systems—gas, water, lighting, air conditioning, heating, telephone lines, etc.—will be located in plenum chambers about six feet high between the first and second stories and between the second story and the roof-top laboratory. Access to the chambers will be through a service shaft in the corner of the building.

This type of construction, it was explained, assures maximum flexibility with a minimum of disruption of research operations when floor space needs are altered by changed requirements or when maintenance is necessary. About 50,000 square feet of floor space is to be provided.

Clean or "white" rooms, occupying only a portion of the dust-free design building, are separated into four categories of progressively higher sanitation requirements. The purpose is to avoid contamination of materials used in solid-state research—crystalline, luminescent and photosensitive.

Sanitation standards also will call for extensive use of stainless steel or porcelain enamel partitions and solid glass ceilings through which light will filter from the plenum chambers.

Researchers will enter certain rooms by stepping on a sticky mat to remove any speck of dust that might have been picked up elsewhere. Then they will pass through an air shower that will be equivalent to a thorough vacuuming. Plastic clothing will encase them completely, even their feet, heads and hands, to prevent release of foreign matter.

Extremely sensitive electronic research will be performed in a "screen room," a space completely screened and grounded to eliminate the possibility of extraneous signals. Each circuit will be designed for complete freedom from outside interference.

A roof-top laboratory will command a view far over the Potomac River for long-range sighting experiments. For other types of complete dark room research, a 200-foot tunnel, five feet in diameter, is to be built along the outside of the building, with entrance only from the interior. It will simulate natural night illumination conditions for experiments with electronic viewing devices.

The near infrared equipment under development requires an auxiliary infrared light to irradiate the target. Radiation reflected from the target is converted to a visible image by a photoemissive tube.

New equipment in this system includes the weaponsight, which can be used on a wide variety of infantry weapons, a transistorized handheld viewer for homing in on an infrared beacon, binoculars which permit driving and working in total darkness, and a tank searchlight kit giving the commander his choice of infrared or visible light.

The image intensification system operates on starlight, moonlight or skyglow, giving it an advantage over near infrared whose auxiliary radiation source makes detection by the enemy easier. It gathers the night light reflected from the target and intensifies it thousands of times to present a visible image.

The special tube which is the heart of the system is being transistorized for use in a night sight for weapons, in helmet-mounted binoculars for night driving, and hand-held binoculars for long-range viewing.

An image intensification tube has been coupled to a special TV orthicon tube to enable commanders to televise distant operations in the dark, giving them ringside seats on the wide atomic age battlefield.

In the battlefield illumination systems, consideration is being given to techniques of creating an "artificial moon" by ionizing the atmosphere.

NIPA Awards Finance Year of Graduate Studies for 3 Army R&D Personnel

Six civilian employees of the U.S. Army, including three men associated with research and development activities, are among 42 civil servants selected from 21 Federal agencies to receive Ford Foundation grants in a program administered by the National Institute of Public Affairs.

Given in nationwide competition, the awards entitle winners to a year of graduate study at selected universities. This year's winners will attend Harvard, Princeton, Virginia, Stanford or Chicago University.

Winners included: Bruce Y. Arakaki 34, Construction Management Engineer, GS–13, Headquarters, U.S. Army, Pacific, Kailua, Hawaii. Wilbur M. Cato, 30, Supervisory Auditor, GS–12, Detroit District, U.S. Army Audit Agency, Detroit, Mich. Thomas M. Leonard, 30, Supervisory General Engineer, GS–13, U.S. Army Production Equipment Agency, Rock Island Arsenal, Rock Island, Ill.

Robert P. Macchia, 34, Chief, Advanced Systems Branch, GS–14, U.S. Army Engineer, Geodesy, Intelligence and Mapping Research and Development Agency, Fort Belvoir, Va. Richard F. Okada, 30, Supervisory Electronics Engineer, GS–13, U.S. Army Electronics Command, Fort Huachuca, Ariz. Charles W. Williams, Jr., 31, Systems Accountant, GS–13, Office of the Comptroller of the Army, Washingtion, D.C.

Competition for the awards was extremely keen, with nearly all major Federal agencies nominating a total of several hundred candidates. Narrowed down to 127 finalists, the list was again screened to arrive at the 42 winners.

The purpose of the program, according to NIPA Board Chairman Charles B. Stauffacher, is to stimulate public agencies to identify their able young administrators early in their careers, and to help them obtain a better understanding of the social, economic and political problems public service executives face.

"We hope also to improve communication between universities and public agencies," he said, "so that universities will have a better idea of public agency needs, and agency administrators will make more use of educational programs specifically geared to these needs."

Under authority of the Government Employees Training Act, award winners will continue to receive their usual salaries. Tuition charges, costs for books and expenses incurred by the universities in providing special classes will be borne by NIPA.

Richard F. Okada
Army Electronics Command
Fort Huachuca, Ariz.

Robert P. Macchia
GIMRADA
Fort Belvoir, Va.

Thomas M. Leonard
PEQUA
Rock Island Arsenal, Ill.

USAERDL Slates Reserve Officer R&D Seminar

The U.S. Army Mobility Command's Engineer Research and Development Laboratories have tentatively scheduled the Sixth Annual R&D Seminar for Reserve Officers at Fort Belvoir, Va., July 21-Aug. 3.

The Seminar, which has drawn approximately 50 officers from all parts of the country in each of the five previous years, is designed primarily to bring officers up-to-date on Engineer developments and goals. A secondary objective concerns possible contributions Reserve Officers may take toward solving R&D problems.

In addition to briefings by personnel of the Laboratories, the Seminar program will include visits to other installations. The Reserve Officers also will have the opportunity to meet and talk with several key Department of Defense and Department of the Army personnel.

Members of Mobilization Designation Detachment 39 at the Laboratories again will serve on the Seminar Staff. Col O. P. Cleaver, Chief of the Electrical Department, is commander of the Detachment.

Nuclear Science Seminar

The 3252nd USAR R&D Unit will conduct a seminar in nuclear science for the Commanding General, 3rd Army, at the U.S. Army Reserve Training Center, Oak Ridge, Tenn., Aug. 11-24.

Maj Gen C. W. Clark, Director of Army Research, will be among speakers to address the tri-service group. The seminar is designed to provide reserve officers having scientific backgrounds with up to date information in the field of nuclear science. Nuclear power reactors, radiation and radiation effects will be emphasized.

Dr. Fisher Joins ARPA Staff

Dr. Bruce S. Fisher joined the staff of the Advanced Research Projects Agency, DoD, late in May as a project manager in the Missile Phenomenology Branch, Missile Defence Office. Previously he had served with the Chemical and Material Branch, Physical Sciences Division, U.S. Army Research Office.

Following receipt of a Ph. D. degree from the Massachusetts Institute of Technology in 1957, he was employed by the Dupont Co., Wilmington, Del., as a research chemist. He has published articles on his R&D studies in ethylene-propylene as a new general purpose synthetic rubber, and holds a patent in this field.

Lt Col Harry V. Ellis

Capt Max W. Noah

Francis T. Brannan

Frank S. Mendez

Army R&D Office in Panama Announces 4 Additions to Test Division Staff

Operational capabilities of the U.S. Army Research and Development Office in Panama, Canal Zone, have been expanded by four recent additions to the Test Division staff.

Col Robert T. Larson, commanding, announced appointment of Lt Col Harry V. Ellis, Jr., as Chief; Capt Max W. Noah, Assistant Chief; Francis T. Brannan, Test Engineer; and Frank S. Mendez, Chief Engineer and Technical Adviser to Col Larson.

LT COL ELLIS came from an assignment as Commanding Officer of the 82nd Airborne Command and Control Battalion, Fort Bragg, N.C. He is a Master Parachutist.

A 1941 graduate of the U.S. Military Academy, he later spent four years there as an instructor in the Mathematics Department. He also spent three years at the Agricultural and Mechanical College of Texas as Deputy Professor of Military Service and Tactics, and has done advanced work in statistics at Columbia University.

During World War II he had extensive service in the Mediterranean, North African and European theaters where he earned seven battle stars as a member of the 9th Infantry Division Artillery.

His other military assignments include tours as an Assistant G3, Headquarters V Corps, Frankfort, Germany, and as Deputy J1 and Plans Officer, Headquarters, United Nations Command, Seoul, Korea.

CAPT NOAH graduated in 1953 from the U.S. Military Academy, where he studied under Col Ellis, and was commissioned in the Corps of Engineers. He served with the 10th Engineer Combat Battalion, 3rd Infantry Division and the 74th Engineer Combat Battalion, 8th Army in Korea until May 1955. From June 1956 until June 1957 he was Assistant Resident Engineer on the construction of the Oahe Dam at Pierre, South Dakota.

In 1958 he received his M.S.E. degree in electrical engineering from Purdue University, where he specialized in electrical machinery and servomechanisms, with a minor in nuclear physics. Assigned to the Military Academy, he instructed in the Department of Electricity until 1962. During his tour at the Academy, the latter two years as an Assistant Professor, he supervised and participated in the writing of a special textbook on Electromagnetic Energy Conversion to be used in the Academy electricity course.

Capt Noah has been awarded the Army Commendation Medal, along with Korean Service Medals, and is a member of the Tau Beta Pi National Engineering Honorary Society. Col Larson commented that his construction and electrical engineering talents have proven invaluable in many of the research and test projects undertaken in Panama.

BRANNAN is experienced in the field of deterioration of materials in the tropics, having been in charge of Naval Research Laboratory's Tropical Exposure Site at Galeta Point, C.Z., for 8½ years. His research there was on deterioration of textiles, leather, elastomers, plastics, metals, electronic and electrical materials and instruments, wood, paints, optics, adhesives, packaging material and methods. He also was involved in various hydrographic and oceanographic experiments.

Graduated from Tufts University in 1938 with a B.S. degree in chemical engineering, he earned a degree in electronic engineering at Northeastern University (Evening Division) in 1954.

During World War II he served in the U.S. Navy on aircraft carriers, returning to civilian life in 1946 after 3½ years of service. From 1939 until 1954, with the exception of the war years, he was employed as a chemical engineer by the Inspector of Naval Materiel, USN, Boston, Mass. He is a member of the Institute of Electrical and Electronic Engineers and of the Society of Naval Architects and Marine Engineers.

MENDEZ was previously employed as Chief Technical Adviser to the U.S. Army Caribbean Ordnance Officer, Fort Amador, C.Z., where he had charge of the Technical Staff since December 1957. He entered the Civil Service as a mechanical engineer in the Design Division of the District Public Works Office, 15th Naval District, Fort Amador, C.Z., from February 1957 to December 1957.

Prior to entering Government service he was progressively employed as a junior engineer, research engineer and specifications engineer with the Firestone Tire and Rubber Co., Akron, Ohio, from April 1951 to February 1957. At Firestone, he assisted in the development of various ordnance items under defense contracts. During World War II he served in the U.S. Marine Corps with duty at Hawaii, Marshall Islands and Guam.

In 1949 he received a bachelor's degree in physics and mathematics and a year later a master's degree from Bowling Green State University, Bowling Green, Ohio. He studied mechanical engineering at Akron University and is licensed to practice as a professional engineer in Ohio and the Canal Zone.

Professional affiliations include Kappa Mu Epsilon, Sigma Delta Pi, National Society of Professional Engineers, American Ordnance Association, and Society of American Military Engineers.

Dr. Wilson Briefs Danes on Army Greenland Program

Danish Government representatives and the Commission for Scientific Exploration in Greenland were briefed recently on the U.S. Army program for scientific research on the Greenland Icecap this summer.

Dr. Leonard S. Wilson visited Copenhagen Apr. 21-26, to discuss plans. As Chief, Environmental Sciences Division, U.S. Army Research Office, he will monitor many of the activities.

Included are geomagnetic measuring tests investigating the effects of Earth magnetism on radio communications. Planned also are studies measuring microseismic vibrations, and glaciological, minerological and geological experiments.

The Army intends to dig a shaft 30 meters below the ice, leading up to the surface through a 100-meter long tunnel sloping 33 degrees. Tests in these depths will seek solutions to problems in radio communications over ice, particularly over areas close to the geographic North Pole. Scientists have long puzzled over radio effects during northern lights and the reason for sudden blackouts.

Dr. Wilson indicated that practical "spin-off" benefits from such projects have been notable in the past. For example, techniques used in the South Polar areas during the last international geophysical year were developed from research conducted in Greenland.

Current interest is focused on the possibility of acquiring information for more reliable weather forecasts by studying Greenland conditions.

Recognizing that Greenland is rapidly becoming an international laboratory, the Danes welcome scientists of other countries into the area, subject to government approval and coordination with related Danish programs, he stated.

Reports of a press conference held by Dr. Wilson, carried in all major Copenhagen newspapers, indicated the visit served to bolster Danish confidence in the scientific research nature of the Army's Greenland activities. Writers said the visit helped assure a people properly proud of its sovereignty and tradition of freedom that the Americans fully respect the the fact that Greenland is a part of Denmark.

Recommendations that presentations on the order of Dr. Wilson's be continued on an annual basis are under study.

Paper Reports Research On Hardening of Alloys

Watervliet (N.Y.) Arsenal research metallurgist Dr. Fritz K. Sautter presented a paper on "Electrodeposition of Dispersion-Hardened Nickel-Aluminum Oxide Alloys" at a recent meeting of the Electro-Chemical Society in Boston, Mass.

Accepted for publication in the Journal of the Electro-Chemical Society, the report covers Dr. Sautter's basic research in dispersion strengthening and hardening in the Advanced Research Laboratory at the cannon design installation.

Nickel-aluminum oxide alloys were electrodeposited from an electrolyte which contained the second phase particles suspended in the solution. Effects of particle concentration, particle size and plating conditions on microstructure, and physical properties were studied.

Increase in deposition (more than four times that of pure nickel) is believed due to the dispersion strengthening defects similar to those observed in sintered or internally oxide metal-metal oxide systems.

Electrodeposition, it is anticipated, will have several advantages as a process in competing with sintering and internal oxidation to obtain dispersion hardened alloys, both for models in studies of the mechanisms of dispersion strengthening and for other technical applications.

Deputy ASA (R&D) Hinman Ends 35 Years Service

Deputy Assistant Secretary of the Army (R&D) Wilbur S. Hinman, Jr., one of the Nation's most highly honored Federal Civil Service career scientists and inventors, quietly terminated 35 years of Government service May 31.

Without fanfare of any kind, without a farewell statement to the press, without any indication of his future plans to close friends, he said goodbye to his working associates and ended responsibilities assumed 20 months ago.

"Gone fishing" is the sign he might have hung on his office door by way of explanation, for that is what he did—departed on a scheduled 2-week visit to Canada's angler's paradise.

Few men in Government service have been more frequently recognized for exceptional accomplishments than Mr. Hinman. Few men can claim a more profound impact through the genius of invention in building the Nation's power. Few men have been more modest and unassuming about high achievement.

For his contribution to development of the radio proximity fuze, a scientific advance of vast significance to victory in World War II, and for other inventions in electronic equipment he was granted 11 patents.

Honors were piled upon him. Among the awards he has received are the Harry Diamond Memorial Award of the Institute of Radio Engineers, the Department of the Army Award for Exceptional Civilian Service, the Department of Defense Distinguished Civilian Service Award, and the President's Award for Distinguished Federal Civilian Service.

Until he accepted appointment as Deputy Assistant Secretary of the Army (R&D), he was Technical Director of the Army's renowned Diamond Ordnance Fuze Laboratories (since redesignated the Harry Diamond Laboratories) in Washington, D.C. He worked with the late Mr. Diamond and others in developing the radiosonde system for collecting upper atmosphere weather data still in wide usage for forecasting.

Born in the Nation's Capital, Mr. Hinman was graduated from the District's Western High School and in 1926 received a B.S.E.E. degree from Virginia Military Institute. After two years as a Westinghouse Electric Corp. employee, he joined the staff of the National Bureau of Standards in July 1928, remaining until he became the first Technical Director of the newly established Diamond Ordnance Fuze Laboratories in 1953.

In importance to victory in World War II, the radio proximity fuze was widely recognized as second only to the A-bomb, but secrecy requirements prevented the inventors, Mr. Hinman and Mr. Diamond, from obtaining a patent until 1958. Its functional principle has many applications to commercial requirements.

The *Civil Service Journal*, official organ of the U.S. Civil Service Commission, in 1962 published a series of articles on Civil Service inventors. Mr. Hinman was acclaimed as one of the foremost in the Nation, along with the statement:

"His associates consider him one of America's top creative minds, and his work and its far-reaching significance bear them out."

DoD Directive 5500.7 Prescribes Standards of Conduct for DoD Personnel

Secretary of Defense Robert S. McNamara has signed a Directive (5500.7) prescribing revised standards of conduct relating to possible conflict between private interests and official duties. These standards are required of all Department of Defense personnel regardless of assignment.

Effective May 22, the Directive implements the President's memorandum of May 2, 1963, for preventing conflicts on the part of special employees such as advisers and consultants and reflects the revision of the criminal code on conflicts of interest, which became effective Jan. 21, 1963. It reflects interpretations of the law outlined by the Attorney General in his memorandum of Jan. 28, 1963.

Titled "Standards of Conduct," the new Directive replaces two parallel directives on the same subject, one dealing with advisers and consultants and the other with all employees. It states that:

"DoD personnel are bound to refrain from any private business or professional activity which would place them in a position where there is a conflict between their private interests and the public interests of the United States. Even though a technical conflict, as set forth in the statutes cited in this Directive, may not exist, DoD personnel must avoid appearance of such a conflict, from a public confidence point of view.

"DoD personnel will not engage in any private activity which involves the use of, or the appearance of the use of, inside information gained through a DoD position for private gain for themselves, their families or business associates. DoD personnel must not use their DoD positions in any way to induce, or give the appearance of inducing, another person to provide any financial benefit to themselves, or persons with whom they have family, business or financial ties."

Provisions of the Directive spell out in detail how these standards are to be observed. A new section prescribes for the first time post-employment restrictions on DoD personnel, both military and civilian. Department of Defense personnel are permitted to own shares of widely held diversified mutual funds or regulated investment companies without disqualifying themselves from dealings with companies whose stocks are held by the fund pursuant to a provision in the new statute.

The President's memorandum made it optional with the Departments whether advisers and consultants must furnish listings of their financial holdings. The Directive establishes a DoD policy to require such a listing. This decision was due to the large procurement activity in which the Defense Department is involved.

Attached to the Directive are a digest of conflict of interest laws, the President's memorandum on conflicts of interest on the part of special Government employees, House Concurrent Resolution 175, 85th Congress, listing a code of ethics for the Government service, Executive Order 10939, providing a guide on ethical standards to Government officials, statement of employment and financial interests, and statement of employment for regular retired officers.

FOAMED PLASTIC SHELTER supports 12-ton bulldozer in test area of Natick (Mass.) Labs of the U.S. Army Materiel Command. Experimental culvert-like structure is foamed polyurethane plastic material sprayed over air-supported form which is removed for re-use when foam becomes rigid. Designed for use as a plastic "tent" or billet for personnel, it can serve as an air raid or fallout shelter and has a variety of other applications. It can be made in a wide range of sizes and configurations depending upon the shape of the air-supported form. This model, which has been in place for more than one year, measures approximately 15 feet long, 8 feet wide, 4 feet high. (For polyurethane foam article, see April 1962 issue, pp. 22-23.)

Lazure Named EUP Director To Aid Labor Surplus Areas

Appointment of Albert C. Lazure as the new Director of Economic Utilization Policy in the Department of Defense was announced May 23. He succeeds Ronald M. Linton, who had held the post since it was created in March 1962.

Lazure served most recently as Procurement Law Counsel for the U.S. Army Materiel Command. For the 15 preceding years he was General Counsel, Army Ordnance Corps.

In his new assignment, he will assure continuing Defense-wide application of policies and practices designed to aid labor surplus areas consistent with procurement objectives and without the payment of price differentials.

Among the problem areas with which he will be concerned are the utilization of manpower and facilities of labor surplus areas, preservation of both management and labor skills, retention of a strong national mobilization and industrial base, and adjustments occasioned by Defense Department contractual and other activities.

A native of Berlin, N.H., he was born Feb. 11, 1908, and is a graduate of the University of New Hampshire and the Georgetown University Law School. He is a professorial lecturer on contract administration at George Washington University, and has done research on defense and space contracting and contract administration while a Federal Executive Fellow at the Brookings Institution for a year. He is a member of the American Bar Association and the Federal Bar Association, and has served in the New Hampshire State Senate.

USARO Officer Assigned to Engineer Unit in Korea

Lt Col Norman R. Rosen, Chief, Research Programs Office, U.S. Army Research Office (USARO), will begin a new assignment in August as Commanding Officer, 13th Engineer Battalion, 7th Infantry Division, Korea.

A 1947 graduate of the U.S. Military Academy, with an M.S. degree in civil engineering from Massachusetts Institute of Technology, he has served with USARO since 1959. Until 1961 he served in the Environmental Sciences Division as staff officer on the Tropical Research Program and as Acting Deputy Chief.

During the past two years he has been in the Research Programs Office, which he helped organize as the Research Programs Division in 1961, and has been instrumental in establishing internal programming and operating procedures for the Army-wide program under the Director of Army Research.

Lt Col Rosen meanwhile has served as staff assistant to the Army Member of the Coordinating Committee on Science, as the research director of the Autoprobe Task No. 2 Steering Committee, and as project officer on the negotiation and leasing of the Highland Building, USARO Headquarters in Arlington, Va.

In 1962 he served five months' TDY as Military Assistant to the Deputy Director, Defense Research and Engineering (Administration and Management), and helped establish an internal programing procedure with ODDR&E.

In the past year, while Chief of the Research Programs Office, he has doubled as Assistant Executive to the Deputy and Scientific Director (USARO) and to the Assistant Director of Army Research.

Awarded the Silver Star for action in the Chosin Reservoir in Korea in 1950, when he was attached to the 1st Marine Division, he also has had duty with construction and combat units on Guam and Japan.

Other assignments include U.S. Army Engineer School and engineer construction duty with the Alaska District, Corps of Engineers.

Lt Col Norman R. Rosen

Army R&D Office in Panama Staffs Research Unit

The U.S. Army Research and Development Office, Panama has announced the appointment of Marvin Gast as Environmental Scientist in the Research Division.

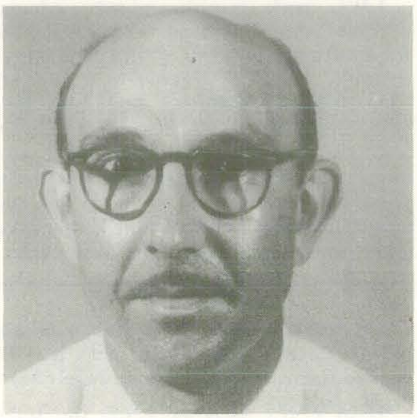
Under the direction of Dr. Leo Alpert, formerly of the U.S. Army Research Office in Washington, D.C., the Division is now completely staffed with Dr. Robert S. Hutton in Life Sciences and Dr. Delaney A. Dobbins in Behaviorial Sciences.

Gast has a B.S. in geography from State College, West Chester, Pa. (1949) and an M.S. in geography from the University of Chicago (1950). Until recently he was employed in the Geographic Branch, Mapping and Geodesy Division, Office of the Chief of Engineer.

During World War II he served in the Combat Engineers and since 1951 has used his wartime experience and geographic training as a specialist in military geography and military engineering with engineer intelligence organizations at Army Map Service and U.S. Forces in Austria.

Prior to joining OCE, he was with the U.S. Army Area Analysis Intelligence Agency. His experience in research and development activities include tours as chairman of the Technical Policy Board of the Engineer Strategic Intelligence Division and as head of the Operations Analysis Branch of the Department of Engineer Intelligence.

In addition to his contributions to numerous area analysis studies, Gast developed the present guidance for the preparation of the Military Geographic Regions sections of the National Intelligence Survey program. In 1960 he received a commendation from the Central Intelligence Agency for his outstanding performance.



Marvin Gast

Maj Gen Rowny Reassigned

Maj Gen Edward L. Rowny, Chief, Army Concept Team, Vietnam, has been named Special Assistant for Tectical Mobility in the Office of the Assistant Chief of Staff for Force Development, effective in June.

Assigned responsibility for coordination of the Army's tactical mobility program to include doctrine, organization, equipment, training and testing, he will coordinate planning, programing and budget activities.

General Hamlett Delivers Roosevelt Lectures in UK

General Barksdale Hamlett, Vice Chief of Staff, U.S. Army, representing the United States, delivered four lectures at the annual Kermit Roosevelt Lectures in the United Kingdom, May 9-14.

The talks were presented at the Royal College of Science, the Imperial Defence College, the Royal Military Academy and the Staff College.

Established by a Joint Congressional Resolution in 1945, the lectures are part of an exchange program sponsored by the Kermit Roosevelt Fund. It is named after the late Maj Kermit Roosevelt, son of President Theodore Roosevelt, who served in the British Army and U.S. Army in both World Wars.

Stated purpose of the lectures is to "foster a better understanding and a closer relationship between the military forces of the United States and those of the United Kingdom."

Lt Gen Sir William Pike, Vice Chief, Imperial General Staff, Royal Army, represented the United Kingdom. He lectured at the Command and General Staff College, the United States Military Academy, the Army War College, and before the combined student bodies of the National War College and the Industrial College of the Armed Forces.

Lt Gen Arthur G. Trudeau (USA, Ret.) gave the Kermit Roosevelt Lectures in 1961 when he was Chief of Research and Development.

Discoveries Spur Development of Nitroso Rubber

Army research "significant breakthroughs" on nitroso rubber achieved during the past two years will receive further impetus as a result of additional funding recently approved to exploit the discoveries.

Notable advances are:

- Discovery of a practical method of making the key raw material used to produce the rubber.
- An improved method of synthesizing the rubber itself.
- A chemical modification of the raw rubber which allows it to be vulcanized more readily and improves physical properties without impairing chemical resistance.

A relatively new synthetic discovered through joint U.S. Army-university-industry research effort, nitroso rubber combines outstanding chemical, fuel, ozone and weather resistance with excellent low-temperature flexibility, nonflammability and fairly good thermal stability.

No other experimental or commercially available synthetic rubber is known to possess this unique combination of properties, Army researchers said. (For technical details, see March 1961 issue, page 10, of this publication.) They envison military application in a chemically resistant coating for a variety of materials, and in bindings for solid propellants and explosives where an inert material is required.

Promising also is the rubber's potential in space vehicles. Plans provide for use as insulation and liner material in rocket motor casings, in seals and gaskets in direct contact with exotic fuels, and in fuel handling equipment such as hoses, especially for low temperature use.

To date, only very small quantities of the raw rubber have been available. As a result, evaluation of the material and development of potential end-item uses have been limited.

The recent research breakthroughs, scientists believe, have demonstrated that nitroso rubber can be produced in large quantity by a practical process, and that suitable chemical modification of the raw rubber will improve both its processability and its properties.

A portion of $400,000 in DoD 1962 emergency funds approved for nitroso rubber research has been used for a contract award to Reaction Motors Division, Thiokol Chemical Corp. Interest in the product's potential was sufficiently high for Thiokol to invest a substantial amount in the effort.

As prime contractor, Thiokol will carry on production of large amounts of the rubber for processing and vulcanizing studies. Goal: A speed-up of development of the new material into a useful product with broadest possible application.

Concurrently, research on the chemical modification of the raw rubber is continuing at an increased rate.

Picatinny Arsenal Picks New Directorate Chiefs

Lt Col Harry H. Olson

Lt Col Harry H. Olson, until recently Chief of the Explosive Ordnance Disposal Office at Picatinny Arsenal, Dover, N.J., has been named Director, Ammunition Engineering Directorate. He succeeds Lt Col Robert H. Blackburn who now heads the Nuclear Engineering Directorate.

A native of Hutchinson, Kans., Col Olson entered the military service in 1939 as an enlisted man and in 1943 was graduated from the Ordnance School at Aberdeen Proving Ground as a second lieutenant.

While in the military service, he earned a B.S. degree from the University of Maryland. A course in Arabic at the U.S. Army Language School prepared him for a tour of duty with the Military Assistance Advisory Group in Libya, Africa.

Among his awards and decorations are the Army Occupation Medal (Germany), Korean Service Medal, United Nations Service Medal, Meritorious Unit Commendation, and the Bronze Star Medal. He has participated in a number of campaigns, including Normandy, Northern France, Rheinland, Ardennes-Alsace, Central Europe, and Korea.

WSEG Top Officials Visit LWL on First Anniversary

Top personnel from the Department of Defense Weapons Systems Evaluation Group (WSEG) visited the U.S. Army Limited War Laboratory at Aberdeen Proving Ground, Md., during the week marking the LWL's first anniversary.

Heading the group on its first visit to the LWL were WSEG's senior U.S. Army and U.S. Navy members, Maj Gen John F. Ruggles and Rear Adm Edward J. O'Donnell. Included were Cols Millard G. Bowen, Lawrence Bowlby and David R. Guy, U.S. Army, Capt Ira M. Rowell, Jr., U.S. Navy, Albert M. Bottoms, Nathan P. Edwards, John Ponturo and Dr. Alexander L. Salfkoski.

The Group is responsible for evaluation of all Army, Navy and Air Force weapons system brought into the national defense structure.

LWL commander Col S. C. Holmes led off the briefing of the 10-man team by explaining the laboratory's organization and mission, including its growth and achievements since it was activated May 15, 1962. Current and planned projects also were outlined.

Robert L. Woodbury, Chief of the Environment and Survival Branch, discussed the LWL-developed individual survival kit for U.S. Army Special Forces and also reported on lightweight personal equipment under development.

LWL work on anti-ambush projects and survival weapons was discussed by Andrew C. Pierne of the Munitions Branch. Edward Vanderlip, Chief of the Mobility Branch, explained development of a lightweight power unit and other projects under his supervision. Dr. Max Drauss, Research Division, discussed the scope of research in the Chemical and Explosive, Electronic, and Biological Branches.

THE BUTTERFLY. There is an old Japanese haiku poem, with a severalfold truth, by Basho (1643-1694):

With every gust of wind, the butterfly changes its place on the willow.

Dr. Sproull to Become Director of ARPA Sept. 1

Dr. Robert L. Sproull, Director of the Materials Science Center, Cornell University, has been named Director of the Advanced Research Projects Agency (ARPA), effective Sept. 1.

Dr. J. P. Ruina, who has held the post since January 1961, served previously as Assistant Director for Air Defense, Office of the Director of Defense Research and Engineering. Planning to return to university work, he is on leave from the University of Illinois as a professor of electrical engineering. Formerly he was on the Brown University staff.

Dr. Sproull received his Ph. D. degree from Cornell University in 1943, worked at the RCA laboratories until 1945, and then joined the Cornell staff, becoming a professor in 1956.

From 1959-60 he was Director of the Laboratory of Atomic and Solid State Physics at Cornell and then assumed his present post. Sabbatical leaves in 1952 and 1958 were spent respectively as physicist at the Oak Ridge National Laboratory and with the European Research Associates in Brussels.

As a consultant to industrial firms and a member of various advisory committees, he has served on the Materials Advisory Board, the Advisory Committee for Solid State Physics of the Nationay Academy of Sciences, and the Laboratory Management Council of the Oak Ridge National Laboratory. Last year he became a trustee of Associated Universities, Inc.

A member of Phi Beta Kappa, Sigma XI and the American Physical Society, he was editor of the Journal of Applied Physics from 1954-57 and is the author of numerous articles in professional journals.

Dr. Robert L. Sproull

Marshall Award Winner Assigned to Group in UK

Lt Col John C. McWhorter, R&D coordinator, Life Sciences Division, U.S. Army Research Office, was reassigned this month as Quartermaster Representative, U.S. Army Standardization Group, United Kingdom.

Stationed in London, England, the Group coordinates U.S. Army activities related to the ABCA (American-British-Canada-Australian) Standardization Program.

A 1946 graduate of the U.S. Military Academy, with an M.S. degree from Lowell Technological Institute, Lowell, Mass., Lt Col McWhorter completed the fall 1962 associate course at the U.S. Army Command and General Staff College. There he received the General George C. Marshall Award as leading student in the class of 444 officers.

Assigned to the USARO staff in July 1961, he previously served as Executive Officer, European Exchange System (1958-61). Other assignments include a 3-year tour on the faculty at West Point, teaching engineer mechanics, and service with RYCOM, as Assistant Class I Officer, Quartermaster Section.

Dr. Dudley P. Glick, Special Operations Division, U.S. Army Biological Laboratories, Fort Detrick, Md., receives Outstanding Performance award from Lt Col Joseph C. Hiett. Dr. Glick was cited for competent and timely accomplishment of major assignments at the Labs, where he started work in 1949, for the period December 1961 to Jan. 1, 1963.

Picatinny Executive Officer Assigned Post in Brazil

Maj Robert J. Hauser, executive officer of Picatinny Arsenal, has been assigned to the Joint Brazil-United States Military Commission in Rio de Janeiro, effective in December.

Prior to reporting to his new assignment, he will study Portuguese at the Defense Language Institute, Presidio of Monterey, Calif., for five months starting July 7.

A native of St. Paul, Minn., he was an industrial architect until he enlisted in the Army in 1942. Selected to attend the Ordnance Officer Candidate School at Aberdeen Proving Ground, Md., he was commissioned a second lieutenant in the Ordnance Corps in 1943.

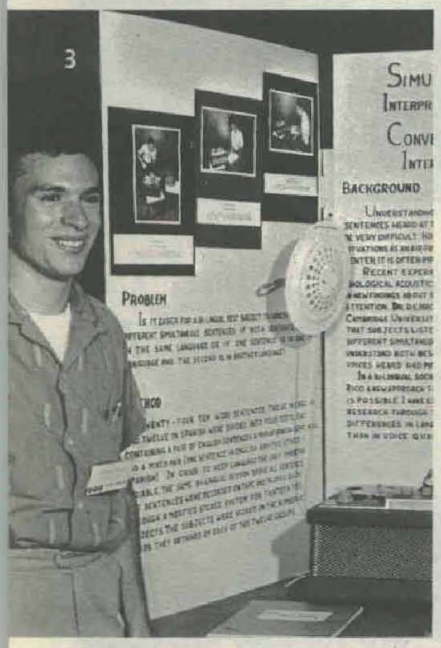
During World War II he participated in the initial landings of U.S. Forces in New Guinea, the Philippine Islands and Japan.

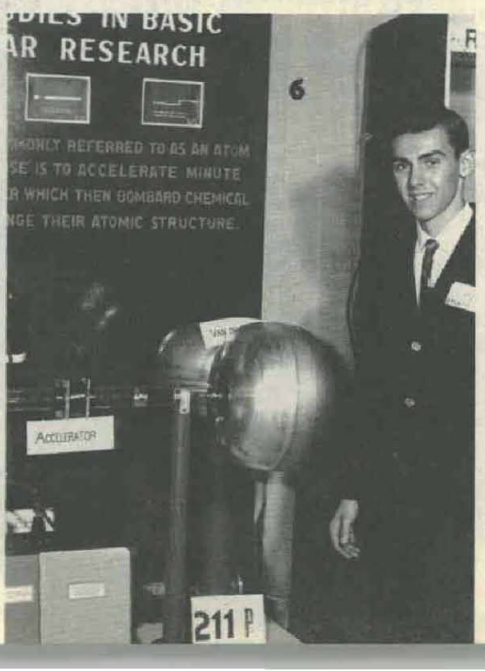
Upon separation from the Army in 1946, he established a contracting business in St. Paul and a water conditioning business in Davenport, Iowa. Recalled to active duty during the Korean War, he was assigned as Ordnance Officer of the 301st Logistical Command during "Exercise Snowfall" at Camp Drum, N.Y.

In Korea from July 1952 to November 1953, he commanded the 44th Ordnance Depot and then served at the Pentagon, Washington, D.C., as the Deputy Chief of the Security Branch, Office of the Chief of Ordnance. His next assignment was Ordnance Supply Officer of the Military Assistance Advisory Group, The Hague, Netherlands.

Maj Hauser attended the University of Minnesota and the Utilities Engineering Institute of Chicago. While in military service, he attended the Special Weapons School and the U.S. Army Ordnance School.

Maj Robert J. Hauser





Army Selects 20 NSF-

(Continued from page 1)

Energy Commission; Dr. Wernher von Braun, Marshall Space Flight Center; and Dr. Edward Teller, University of California Radiation Laboratory and a leading developer of the hydrogen bomb.

Top-ranking military participants representing each of the Services were Vice Adm Hyman Rickover, U.S. Navy nuclear submarine expert; General Bernard A. Schriever, Commanding General of the Air Force Systems Command (formerly Air Research and Development Command); and Maj Gen C. W. Clark, Director of Army Research, known for his ability as a scientist as well as a military leader.

President Kennedy sent a tape-recorded speech in which he called the NSF-I program a "major contribution toward increasing the reservoir of scientific and technical manpower which is needed to lead the Free World. . . .

"If we are to maintain the security of the Free World, continue our own economic progress and well-being and aid those nations where development still lags, then we must increase our reservoir of scientific and technical manpower. . . ."

Maj Gen Clark not only made one of the major addresses of the Fair, in which he detailed the role of research and development in meeting the rapidly changing requirements of a modern army, but also made three other presentations of about 2½ hours each in seminars.

Dr. Paul Siple, Scientific Adviser of the U.S. Army Research Office and the chairman of the Army panel of judges for the past six years, also made four seminar presentations.

Other Army scientists who made four presentations each included Dr. John H. Giese, Army Ballistic Research Laboratories, Aberdeen Proving Ground, Md.; Dr. J. Fred Oesterling, Quartermaster Research and Engineering Center, Natick, Mass.; Dr. Russell E. Sherburne, Chief Scientist, White Sands (N. Mex.) Missile Range; and Dr. Keith Smart, Dugway Proving Ground, Utah.

The Army judges panel included Dr. Robert E. Frese, Chief Scientist, U.S. Army Electronics Proving Ground, Fort Huachuca, Ariz.; Dr. Richard D. Costlow, Assistant Chief, V&R Division, U.S. Army Biological Laboratories, Fort Detrick, Md.; Glenn Elder, Chief of the Nuclear

inners for Jobs, Visits

Laboratory, White Sands Missile Range; Capt Martin S. Litwin, Surgical Research Branch, Medical R&D Command, Washington, D.C.; and Dr. Thomas S. Simmons, Chemical Research Development Laboratory, Edgewood Arsenal, Md.

Take 411 finalists in the NSF-I, talk to them about their research projects, their youthful dreams and aspirations, and you come up with 411 human interest stories of high endeavor. The drama of human effort in reasearch, often under the most discouraging personal circumstances, is always there.

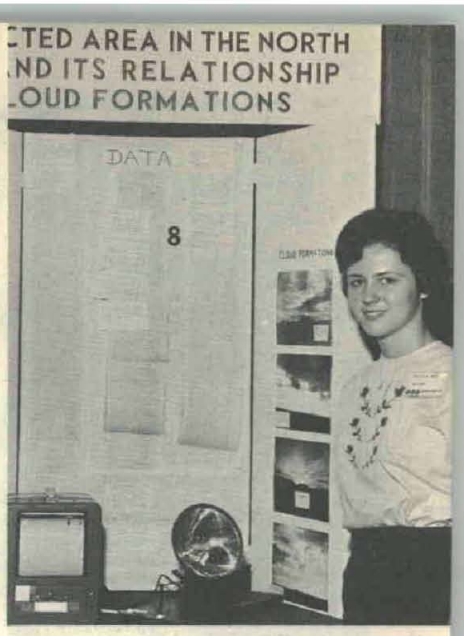
As Dr. Siple said: "The 1963 fair was just as astonishing as ever—always an almost incredible exhibit of the brainpower of young America. It is always wonderfully stimulating to one's faith in the future of America to see the capabilities of high school science students displayed at the Fair."

In the hectic rush of the activities, the constant flow of the crowd through exhibit booths that keeps the young scientists busy demonstrating what they have done or are trying to do, it is difficult for the judges to get many of the human interest stories of the participants. Take, for example, Rhea L. Keller, New Haven High School, New Haven, Ind.

Rhea will spend a one-week all-expense paid visit to the Walter Reed Army Institute of Research in Washington, D.C., where she will have an opportunity to pursue her interest of biological research. Capt Litwin, the judge representing the Medical R&D Command, considers the work she has done with crude equipment "quite remarkable."

Studying cancer, Rhea, 17-year-old daughter of a semiskilled laborer, reported on her results in an exhibit titled "Subcutaneous Induction of Malignant Melanoma in the Syrian Hamster with Cell-Free Extracts." Object: To determine if cancer is caused by a virus.

Rhea's conclusion, carefully supported by records of her experiments, is that one of the carcinogens of the



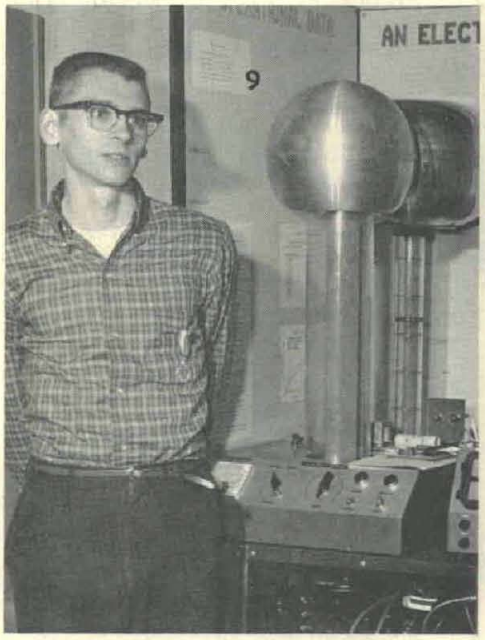
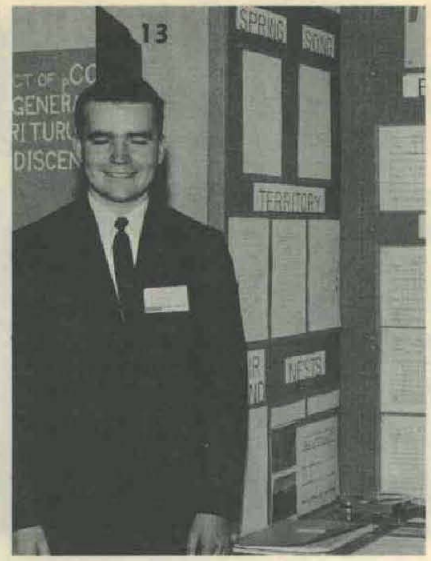
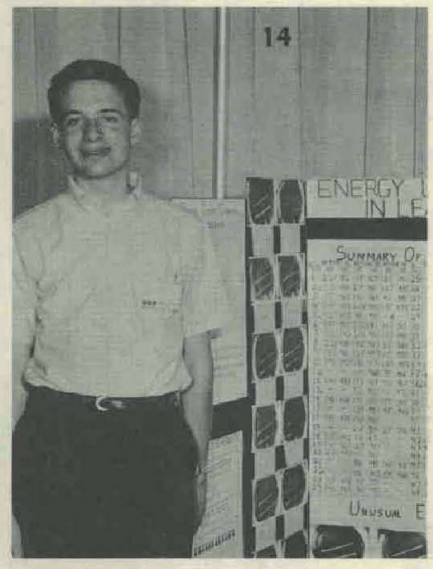
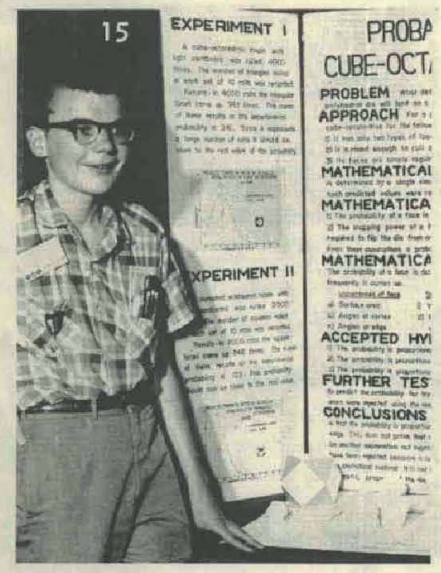


Fig. (1) Robin K. DeVore. (2) Rhea L. Keller. (3) Richard I. Gomberg. (4) James A. Moorer. (5) Barbara M. Descoteaux. (6) Bruce E. Bowman. (7) Robert J. Staniewicz. (8) Sheila E. McMorris. (9) Vance G. Marshall, Jr. (10) Randall C. Zisler. (11) Amory B. Lovins. (12) Malcolm D. May, Jr.







neoplasm is a virus. Moreover, in tests with carefully filtered samples she was able to establish that cancer developed in about 25 percent of the subjects, and that vulnerability is variable with age and sex. Young hamsters were relatively immune.

A National Honor Society member and a winner at science fairs since 1958, Rhea is an active girl with a wide variety of interests, including 4-H Club, church, public speaking and photography groups, cooking, sewing, music, philosophy, Junior Red Cross, Student Council, and golf.

Selected as an alternate to Rhea for the visit to WRAIR is a girl whose research was considered by judges as little less exceptional. Miss Deborah Chase, also 17, of Bronx High School, N.Y., titled her exhibit "Findings on the Simultaneous Production by Cells of an Anti-Viral Agent and a Halo-Producing Factor in Response to Inactivated Viruses."

For the past five years Deborah has been engaged in research on viruses. This year she found a new anti-viral agent (AVA) and new support for the metallic ion hypothesis for lysis inhibition.

Many judges considered her research extraordinarily advanced, and the Air Force reportedly was trying to arrange to send her to Europe for three months to demonstrate her techniques to researchers in Air Force laboratories.

Deborah's father, Allan Chase, is a writer and Mrs. Chase is a painter. A winner in junior science fairs since 1957, Deborah finds time for numerous other activities, including art, writing, public speaking, photography, music, mathematics, chess, Student Council, dancing, and swimming.

Judges who chose Walter B. Paluchowski, Jr., of Coughlin High School, Wilkes-Barre, Pa., were amazed at the ingenuity, enterprise and skill he blended in improving equipment for an exhibit titled "Mapping the Invisible Universe." Largely from material salvaged from junk yards, he put together a telescope and other instruments to achieve excellent results. He will spend a week at GIMRADA, Army Mapping Service, Corps of Engineers, Ft. Belvoir.

For each of the other 19 Army winners, and the other 12 alternates who will spend time at Army laboratories only if the winners cannot accept offers, similar stories of youthful initiative at work on research projects might be told. Triumph, pathos, humor and many other facets of life comprise the NSF-I.

The restless drive of would-be scientists seeking new knowledge was evident in their conversations with judges seeking to probe the depth of their studies in pursuit of projects.

Most of the Army winners and alternates are representatives of small towns. Many of them are not near libraries stocked with the books they need for their research. But the majority of them have traveled considerable distances for information.

"Most of them," one of the judges commented, "are extremely knowledgeable. Conversation with them shows they have read a great deal to learn all they can about their areas of interest."

Original thinking, unhampered by the influence of professionals more knowledgeable about what is logically possible or impossible, is a characteristic of NSF-I displays. As one Army judge stated: "In a great many cases we saw results of research that more experienced scientists have stated could not be successful—only by the enthusiastic urge of young minds it was."

Nine offers of summer employment at Army laboratories and 11 offers of a one-week all-expense paid visit to a laboratory engaged in the research in which they are interested will reward winners selected by the Army at the 14th NSF-I.

In addition, the Aviation Association of America chose Donald B. Bliss of Murphy High School, Mobile, Ala., for a plaque and a $100 cash award. Although listed as an Army winner, he is not eligible for a job offer or laboratory visit for his exhibit titled "Radio Controlled Peripheral Nozzle Air Cushion Vehicle."

Army winners, the laboratory they will visit or work at, and the titles of their exhibits at the NSF-I are:

U.S. Army Electronics R&D Laboratory, Fort Monmouth, N.J.: Bruce E. Bowman, 18, Pennsbury High School, Yardley, Pa., "Design, Construction and Use of a .5 MEV Linear Particle Accelerator in a Study of Short DeBroglie Wavelengths by Electron Crystal Defraction Method." Vance G. Marshall, Jr., 17, Flint (Mich.) Central H.S., "Atom Smasher—An Electrostatic Particle Accelerator." Donald E. Peterson, 16, Oak Ridge (Tenn.) H.S., "Probability of Cube-Octahedron Dice."

Fig. (13) Harry W. Power, III. (14) David E. Katz. (15) Donald E. Peterson. (16) Walter B. Paluchowski, Jr. (17) Daniel R. Jacobsmeyer. (18) Waldean A. Schulz.

U.S. Army Chemical Center, Edgewood, Md.: Donald J. Crownover, 18, Rock Island (Ill.) H.S., job offer, "Basic Studies in Boron-Organic Polymer Chemistry." David E. Katz, 18, Baltimore (Md.) City College H.S., "Energy Loss of Beta Particles in Lead and Aluminum." Sheila E. McMorris, 18, West Phoenix (Ariz.) H.S., job offer, "Infrared Content of a Selected Area in the North Sky and Its Relationship to Cloud Formations." James A. Moorer, 17, Leon H.S., Tallahassee, Fla., job offer, "Memory and the Planaria."

U.S. Army Biological Laboratories, Fort Detrick, Md.: William E. Murray, 17, Walter Johnson H.S., Bethesda, Md., job offer, "Stochastic Radioactive Equilibria Models." Robin K. DeVore, 17, Highland H.S., Albuquerque, N. Mex., job offer, "An Investigation of Erythrocyte Phosphatases." Robert J. Staniewicz, 17, Southington (Conn.) H.S., job offer, "Electrochemical Analysis by Polarography."

Quartermaster R&E Center Laboratories, Natick, Mass.: Barbara M. Descoteauz, 17, Mt. St. Michael H.S., Reading, Pa., "Bio-Chemistry of Farnesol."

U.S. Army Electronics Proving Ground, Fort Huachuca, Ariz.: Richard E. Gomberg, 17, Immaculate Conception Academy, Mayaguex, Puerto Rico (the first student from Puerto Rico ever selected by the Army at the NSF-I), "Interpretation of Simultaneous Sound."

Harry Diamond Laboratories, Washington, D.C.: Daniel R. Jacobsmeyer, 18, Hazelwood H.S., St. Louis, Mo., "Bio-Medical Engineering."

Walter Reed Army Institute of Research, Washington, D.C.: Rhea L. Keller, 17, New Haven (Ind.) H.S., "Subcutaneous Induction of Malignant Melanoma in the Syrian Hamster with Cell-Free Extracts."

Army Ballistic Research Laboratories, Aberdeen Proving Ground, Md.: Amory B. Lovins, 15, Amherst Reg. (Mass.) H.S., "Research in Differential Geometry and Topology."

Brooke General Hospital, Fort Sam Houston, Tex.: Malcolm D. May, Jr., 18, Greenwood (Miss.) H.S., "The Effects of Traumatic Shock Conditioning on the Phagocytic Activity of the Renticuloendothelial System."

GIMRADA, Corps of Engineers, Fort Belvoir, Va.: Walter B. Paluchowski, Jr., 18, "Mapping the Invisible Universe."

Dugway Proving Ground, Utah: Harry W. Power, III, 18, Great Falls (Mont.) Central H.S., "Life History of the Mountain Bluebird."

U.S. Army Transportation Research Command, Fort Eustis, Va.: Waldean A. Schulz, 17, Roy J. Watson H.S., Colorado Springs, Colo., "Dynamics of the Boomerang."

U.S. Army Waterways Experiment Station, Vicksburg, Miss.: Randall C. Zisler, 16, Wakefield Sr. H.S., Arlington, Va., "From the Drafting Board to the Finished Product."

ALTERNATES SELECTED ARE:

Army Chemical Center, Edgewood, Md.: John Holian, Jr., 17, Archbold (Ohio) H.S., job or visit, "Effect of Phagocytized Yeast Cells on Macrophage Proliferation in Vitro." Laura L. Norman, 18, Terry Parker H.S., Jacksonville, Fla., job or visit, "Cobalt, Nickel and Iron Complexes: Synthesis and Resolution of Optical Isomers." Michael Kaku, Cubberly H.S., Palo Alto, Calif., "The Creation of Anti-Matter."

Army Biological Laboratories, Fort Detrick, Md.: James L. Ash, Jr., 18, job or visit, "Effects of Cooling on Radiation Damage to Living Cells." Eddy B. Cordes, 16, St. Mary's H.S., Lawton, Okla., "Effects of Oxidative Phosphorylation and Photosynthesis on Sap Rise." Paul V. Roling, 17, Wahlert H.S., Dubuque, Iowa, "Organic Qualitative Analysis for Minerals."

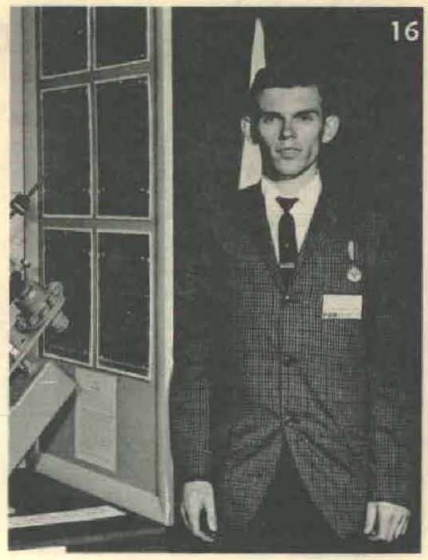
Brooke General Hospital, Fort Sam Houston, Tex.: Henry H. Caddell, 18, Decatur (Ala.) H.S., "Photoreactivation of Newcastle Disease Virus."

Walter Reed Army Institute of Research, Washington, D.C.: Deborah Chase, 17, Bronx (N.Y.) H.S., "Findings on the Simultaneous Production by Cells of an Anti-Viral Agent and a Halo-Producing Factor in Response to Inactivated Viruses." Doris J. Reitinger, 17, Cheltenham H.S., Wyncote, Pa., "The Effects of Colchicine of Twinner *Rana Pipiens* Embryos."

Army Electronics R&D Laboratory, Fort Monmouth, N.J.: Stevens S. Muchnik, 17, Henry Grady, H.S., Atlanta, Ga., "A General Theory of a Group of Recurrent Sequences." James K. Baker, 18, Yorktown H.S., Arlington, Va., "Research in the Theory of Games."

GIMRADA, Corps of Engineers, Fort Belvoir, Va.: Terry R. Richardson, 16, The Porter Academy, Charleston, S.C.: "How High are the Crater Walls on the Moon?"

Harry Diamond Laboratories, Washington, D.C.: Frank D. Kucera, 18, Jr., John Adams H.S., Cleveland, Ohio, "The Production of Plasma by a High Frequency Magnetic Field."



Army Contracts Exceed $65 Million

Awards of contracts totaling more than $65 million for development and procurement of military materiel and services were announced recently by the Department of the Army.

Two contracts aggregating $10,798,465 went to General Motors Corp., Indianapolis, Ind., for transmissions for the 8-inch howitzer and armored recovery vehicle and other self-propelled howitzers.

For production of metal parts for the 155 mm. projectile, Amron Corp., Waukesha, Wis., received $7,811,790 and Minneapolis Honeywell Regulator Co., Hopkins, Minn., $6,034,011 contracts. Studebaker Corp., South Bend, Ind., is to get $7,731,126 for 4,192 2½ton cargo trucks.

Ammunition contracts included: Aerojet General Corp., Downey, Calif., $5,094,770; Firestone Tire and Rubber Co., Akron, Ohio, $3,218,600; Action Manufacturing Co., Philadelphia, Pa., $2,087,143; Remington Arms Co., Inc., $1,769,104; and Olin-Mathieson Chemical Corp., East Alton, Ill., $$1,707,812.

Demolition kits for clearing mine fields are ordered in a $2,459,118 contract let to Lockley Machine Co., Inc., New Castle, Pa. For 68 crane-shovels the American Joist and Derrick Co., St. Paul, Minn., received a $1,904,743 contract.

A $1,890,811 contract for engineering service in connection with production of the Sergeant missile was let to Sperry-Rand Corp., Salt Lake City, Utah. Joy Manufacturing Co., Chicago, Ill., received a $1,725,337 contract for air compressors.

Production of 449 teletypewriter sets is the basis of a $1,610,828 contract received by Smith-Corona-Marchant, Deerfield, Ill. International Telephone and Telegraph Corp., Nutley, N.J., received a $1,561,814 contract for radio relay equipment.

Chrysler Motor Corp., Warren, Mich., received a $1,511,813 contract for chassis for ¾-ton trucks. For production of boosters to be used as components of shells, shot and projectiles, Ingraham Co., Bristol, Conn., was awarded $1,470,600 contract.

A $1,133,966 contract let to Allis-Chalmers Manufacturing Co., Portland, Ore., is for two 55,000-horsepower hydraulic turbines. Continental Motors Corp., Detroit, Mich., received a $1,325,000 letter contract for gasoline engines.

Additional contracts included: General Motors Corp., Cleveland, Ohio, $1,282,478 for repair parts for the M114 armored command and reconnaissance vehicle; General Dynamics Corp., Pomona, Calif., $1,242,000 for research and development of the Redeye missile system; Hayes International Corp., Birmingham, Ala., $1,080,000 for modification kits for Pershing missile trainers; and Ford Motor Co., Dearborn, Mich., $1,052,830 for 336 cargo trucks.

Role of Paul Greer Recognized

Chief Scientist Dr. Robert E. Weigle of Watervliet Arsenal, Watervliet, N.Y., requested the editor, in a letter dated May 27 to give all due credit to Paul Greer, Associate Director, Chemistry Division, U.S. Army Research Office-Durham, N.C., for his role in a recent conference.

The parley on high pressure research on materials was held at Watervliet Arsenal, but Dr. Weigle desires to acclaim Mr. Greer for arranging the technical aspects of the meeting, including the participation of many of the Nation's leading authorities in materials research.

TRECOM Tests Precision Drop Glider at Yuma Station

The Precision Drop Glider, a new concept in the aerial delivery of supplies, has been successfully tested at Yuma, Ariz., by the U.S. Army Transportation Research Command, Fort Eustis, Va.

Utilizing the flexible wing concept, the precision drop glider is designed to deliver large quantities of supplies into areas of limited space. Priority cargo such as ammunition, food, medicine, etc., can be delivered by an aircraft without actually flying over the drop zone.

(An outgrowth of the paraglider concept, the flexible wing development for troop landings and logistics glider possibilities was reported in July 1962 issue of this publication.)

The paraglider wing, fabricated of extremely lightweight, flexible, plastic-coated material, is folded into a compact package similar to a parachute pack and attached to a cargo container. As the container is ejected, a static line attached to the aircraft begins a sequence of operations to deploy the glider, which carries the cargo container to earth.

The wings and control equipment, including radio guidance, were built from commercial, off-the-shelf components, making it both economical and serviceable for operations in any part of the world.

Precision Drop Glider, using flexible wing concept, complete successful aerial drop deliveries in USATRECOM tests at Army's Yuma Station.

In more than 130 missions flown at the Army's Yuma Test Station, a high degree of reliability was achieved. The system is designed to deliver ultimately cargoes as heavy as 5,000 pounds and is built by Ryan Aeronautical Co., San Diego, Calif.

"FLEEP" (Flexible Wing Aerial Utility Vehicle) was delivered late last month to the Army Yuma (Ariz.) Test Station for flight testing. Design calls for payload of 1,000 pounds, 100-mile range and a take-off distance less than 300 feet. Built for the Army by Ryan Aeronautical Co., the vehicle is one of three projects utilizing the flexible wing concept for air-drop deliveries. Lou Everett, Ryan's chief engineering test pilot who flew the world's first powered flexible wing, will test it.

Maj Gen Gibbs Takes Over as Chief Signal Officer as Maj Gen Cook Retires

Maj Gen Earle F. Cook, Chief Signal Officer, U.S. Army, retired June 30 after 32 years of service since his graduation from the United States Military Academy.

Maj Gen David P. Gibbs, Deputy Chief Signal Officer, since Jan. 1, 1963, takes over in the top position. Moving into General Gibbs' position, effective in September, will be Brig Gen Allan T. Stanwix-Hay, Commanding General of the U.S. Army Electronics Materiel Agency, Philadelphia, Pa.

Over a decade ago, General Cook began an early association with missile electronics work as commander, White Sands Signal Corps Agency, White Sands, N. Mex. Subsequently he was appointed deputy commander of the U.S. Army Electronics Proving Ground at Fort Huachuca, Ariz.

From 1955 to 1958 he commanded the U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J. During this tour the first solar conversion for satellites, used with VANGUARD I, was developed. Before appointed 19th Chief Signal Officer, he served in Washington, D.C. as Chief of the Research and Development Division and as Deputy Chief Signal Officer.

MAJ GEN GIBBS served as Assistant to the Chief Signal Officer for several months prior to promotion to Deputy Chief. Other recent assignments include: Chief Signal Officer, Headquarters, Continental Army Command, Fort Monroe, Va.; commander of the U.S. Army Signal Training Center, Fort Gordon, Ga.; and Deputy Chief of Staff, Communications and Electronics, Headquarters, NORAD, Ent Air Force Base, Colo.

Maj Gen Earle F. Cook | Maj Gen David P. Gibbs | Brig Gen Stanwix-Hay

BRIG GEN STANWIX-HAY previously served with the Office of the Deputy Chief of Staff for Logistics. Earlier assignments in the Office of the Chief Signal Officer include serving as commanding officer of both the Signal Corps Publications Agency and the U.S. Army Signal Materiel Support Agency.

Missile Command Awards CPIF Contract for TOW

Research and development work on a new heavy assault weapon system for the combat infantry man is on a cost-plus-incentive-fee contract based on the contractor meeting targets set for performance, cost and time.

Awarded recently by the Army Missile Command, Redstone (Ala.) Arsenal, to Hughes Aircraft Co., Culver City, Calif., the $2,850,000 contract is for a system known as TOW (Tube launched Optically tracked Wire guided missile), designed for use against heavily armored tanks and similar targets.

As envisioned in its definition period, TOW normally will be carried by light vehicles such as tracked carriers and trucks or it can be transported by combat infantrymen. Feasibility studies began in January 1962.

The TOW missile system is similar to other antitank systems but will use different guidance principles. The missile is to be optically tracked and automatically guided in flight by commands transmitted by a 2-wire link between the gunner and the missile.

Awarded on a yearly basis, the TOW contract is under the direction of the Antitank and Aircraft Weapon Commodity Manager at the Army Missile Command, Redstone, Ala.

Col Durrenberger Takes Command of Springfield Armory

Col William J. Durrenberger assumed command of Springfield Armory, Springfield, Mass., July 1. Announcement of the assignment was made by Maj Gen Nelson M. Lynde, Jr., Commanding General of U.S. Army Weapons Command.

Chief of Staff at the Army Weapons Command since August 1961, Col Durrenberger replaced Armory Commander Col C. L. P. Medinnis, who is leaving for an overseas assignment.

The nation's oldest manufacturing arsenal, Springfield Armory is one of three arsenals in the Army Weapons Command complex. Its official history dates back to 1794 when it was formally established as a national armory by Congress, acting upon President George Washington's personal recommendation. Today, Springfield is the principal small arms research and development center for the U.S. Army.

Many of Col Durrenberger's 23 years of service have been in the management of research, development, and production activities. He holds a B.S. degree from the University of Maryland and an M.B.A. from Syracuse University.

During World War II, he served over three years in Europe in technical intelligence. Subsequent duty has included three separate assignments in Washington, D.C. and two assignments at the Army's guided missile center at Redstone Arsenal, Huntsville, Ala.

Col William J. Durrenberger

France Honors General Wheeler

General Earle G. Wheeler, U.S. Army Chief of Staff, received the rank of Commander of the Legion of Honor at a May 23 ceremony at the French Embassy, Washington, D.C.

The Ambassador of France presented the award in the name of his government for services rendered to the cause of Franco-American relations during the general's tour as Chief of Staff of the 63rd Division and Deputy Commanding General of U.S. Forces in Europe.

WSMR Planner Nominated for Rockefeller Award

Administrative and scientific services to the Government since the 1930's have earned a Rockefeller Public Service Award nomination for a pioneer planner of White Sands Missile Range, N. Mex. He is Benjamin E. Billups, Deputy Chief of the WSMR Data Reduction Division.

Princeton University is offering the Rockefeller Public Service Award for the first time. Five awards of $5,000 will be made for achievements in the fields of administration; foreign affairs or international operations; law, legislation and regulation; national resources and welfare; and science, technology and engineering.

The nomination of Billups states:

". . . Through foresight, perseverance and devotion to the highest ideals of his profession, [he] developed a data processing organization which is now performing a significant part in the conduct of tests for the development of the Nation's weapons systems and space research vehicles.

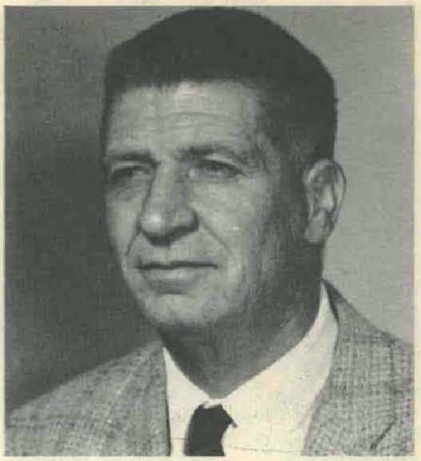
"His personal contribution to this new and specialized field has tremendously reduced the time required for evaluation of missile systems, thus enabling this Nation to maintain leadership in scientific achievement and military might."

In 1932 he began his career as a surveyor with the U.S. Coast and Geodetic Survey, and up to 1940 performed this work for several agencies. During World War II he served in combat areas in Africa, Sicily, Italy and Germany, and is now a lieutenant colonel in the Corps of Engineers Active Reserve.

As Chief of the WSMR Engineering Branch in 1947, he made the original coordinate survey net for the range and adapted optical tracking devices to gun mounts to serve as an instrumentation system. With the installation of the first automatic computers in 1951, he was given the job of organizing the Data Reduction Branch. This was the origin of the organization he heads today.

In the past decade Billups instituted training and recruiting programs which enable WSMR to accomplish analysis on rockets developed and tested since the early V-2 days. He succeeded in merging such varied functions as data collection, editing, conversion, computing and data analysis to the point where the continuity once lacking is now routine.

In addition, he was instrumental in effecting the cooperative student-trainee program which, in assisting promising science and engineering students, helps develop a labor pool of skilled undergraduates for future work in missile development.



Benjamin E. Billups

Study Contracts Awarded For Sprint Missile Fuel

Two contracts totaling $700,000 for propellant studies on the Sprint missile were awarded late in May by the Nike Zeus Project Office at Redstone Arsenal, Ala.

The Sprint will be a part of the Nike X antimissile missile system, an advanced version of the Nike Zeus system. Col I. O. Drewry is the project manager.

The contracts, each for $350,000, went to the Aerojet-General Corp. for work to be performed at Sacramento, Calif., and the Thiokol Chemical Corp. facilities at Huntsville, Ala.

Western Electric Co. is the prime contractor for Nike X and Bell Telephone Laboratories have responsibility for system design and development. Martin-Marietta will build the Sprint missile.

Dr. Lyons Succeeds Dr. Hoehn in Key HumRRO Post

Dr. J. Daniel Lyons, Director of Research at the U.S. Army Aviation Human Research Unit at Fort Rucker, Ala., since 1959, recently joined the staff of the Human Resources Research Office in Washington, D.C.

As the successor to Dr. Arthur J. Hoehn, Dr. Lyons is Director of Research in the Training Methods Division. Dr. Hoehn continues as Chief of HumRRO's newest unit, the Language and Area Training Division, a post he assumed as an additional duty when the unit was activated Apr. 1.

A veteran of 10 year's experience with HumRRO, Dr. Lyons served as a member of the Training Methods Division and of the U.S. Army Infantry Human Research Unit at Fort Benning, Ga.

A human research unit is a joint military-civilian organization in which the HumRRO civilian director is responsible for the technical direction of research and the military chief for the conduct of military affairs.

Dr. Wallace W. Prophet a veteran task leader of HumRRO projects at Fort Rucker, was promoted to succeed Dr. Lyons. A former instructor in psychology at the University of Florida, he is one of the few civilians to complete Army fixed-wing aviator's flight training.

Dr. Wallace W. Prophet (right), new Director of Research at the U.S. Army Aviation Human Research Unit at Fort Rucker, Ala., discusses duties with his predecessor, Dr. J. Daniel Lyons, who joins HumRRO in Washington, D.C.

D&PS Recognize APG Automotive Engineer With 1962 Director's Award

Development and Proof Services at Aberdeen Proving Ground, Md. have recognized an automotive engineer with the 1962 Director's Award, the highest honor awarded annually to civilian employees of D&PS.

Ray L. Wiles was cited for his achievement in demonstrating the feasibility of an adaptation kit that enables the M60 tank to negotiate "underwater fords" while fully submerged. He is Chief of the Field Engineering Section, Automotive Engineering Laboratory.

Col Eugene C. Barbero, Director of the D&PS presented the award at recent ceremonies attended by 80 employees. Wiles was cited for his developmental work on the kit for the Army's main battle tank. Although incomplete, the work provides the concept for further investigations.

A 22-year veteran of Government career service, Wiles has designed the kit to permit armor units to cross most inland waterways in company with supporting armored personnel carriers. Equipped with the kit, a tank presumably could negotiate deep water from a ship off-shore or traverse small streams without reliance on bridging operations.

Wiles was nominated for the Director's Award by the 6-member D&PS Honorary Awards Committee headed by William J. Murphy, Executive Assistant to the Director.

Ray L. Wiles (second from left) receives Director's Award from Col Eugene C. Barbero, Director of APG, Development and Proof Services. Observing are Richard W. Johnson (left), Chief of the Automotive Engineering Lab., and Richard P. Witt, Deputy Director for Supporting Services.

Initiated in 1961 by Col H. B. McBride, former Director of D&PS, the award was won that year by Lawrence Moore, Assistant Test Engineer for the Infantry and Aircraft Weapons Branch.

Limited to technical personnel of D&PS at the working project engineer or staff levels, the award is based on a specific technical project or study that results in highly significant progress in ordnance test technology or ordnance engineering.

Wiles attended Appalachian State Teachers College in Boone, N.C., majoring in education, and continued his education in mechanical engineering at the University of Delaware. In 1941 he came to the Proving Ground in June as an engineering aid in the Automotive Division.

UNDERWATER FORDING KIT conceived by Ray Wiles enables M60 tank to ford streams while fully submerged. The main battle tank is equipped with escape hatch, extension tube, auxiliary exhaust shaft.

Shillelagh Missile System Basis of $6,138,888 Award

Continued development of the Shillelagh missile system is the basis of an award of $6,138,888 to Ford Motor Company's Aeronutronic Division, announced May 9 by the U.S. Army.

The Shillelagh Missile Engineering Command, Redstone Arsenal, Ala., Division located at the Army Missile has responsibility for all engineering activities pertaining to the missile.

Shillelagh is a lightweight, surface-to-surface guided missile system for close-in support of troops. It will greatly increase firepower against armor as well as troops and field fortifications. Vehicle mounting is one application of the system.

Development is part of the Sheridan-Shillelagh project being managed by Col Wayne G. Higgins, Army Weapons Command, Rock Island, Ill. The Los Angeles Procurement District will administer the contract for the Army. Work is to be performed at the Aeronutronic plant, Newport Beach, Calif.

Military Adviser, Anthropologist Join SORO Staff

Col Richard H. Moore (USA, Ret.) is newly assigned as Military Adviser in the Special Operations Research Office (SORO) of the American University, Washington, D.C.

Until his recent retirement, he had served three years in the Subsidiary Activities Division of J-5 and its successor organization, Office of the Special Assistant to the Director, Joint Staff for Counterinsurgency and Special Activities (SACSA).

During World War II, he was battalion commander with the 182nd Artillery Division in Europe. Other assignments have included duty with the Military Government Section, Headquarters, 8th Army, in Japan; instructor at the Command and General Staff College, Fort Leavenworth; assistant commander, VII Corps Artillery, Germany; commander, 35th Artillery Group, Germany.

Col Moore holds a B.A. degree in economics and an M.B.A. in marketing and advertising from the University of Michigan.

KEITH F. OTTERBEIN also is a new member of the SORO staff, assigned as Research Associate in the Operational Applications Research Division. He holds a B.A. degree from Pennsylvania State University in sociology, an M.A. degree from the University of Pennsylvania in anthropology, and expects a Ph. D. from the University of Pittsburgh.

Redstone Arsenal Tries Automatic Shipment of New Books for Scientists

Call it Drop Shipment, Books on Approval, or Standing Orders. By any term, it denotes an enterprising and novel approach to Redstone Arsenal's overall approach to the complex scientific and technical information dissemination problem.

As an experimental venture, the plan is getting good results in helping to keep scientists and engineers more currently informed on significant reports.

Since December 1962, the Redstone (Ala.) Scientific Information Center, U.S. Army Missile Command Headquarters, has received 565 volumes (as of mid-May) from 38 publishers on Automatic Drop Shipment.

ADS volumes, for the most part, have been within certain restricted subject areas of the physical sciences, engineering and related subjects in which personnel are most interested.

Proposed by the Redstone Scientific Information Director, F. E. Croxton, the system is serving to keep laboratory personnel better informed on progress in science closely related to their research and development tasks. They receive new books soon after they are published, without having to request them.

Documents and reports (including microfilm) are received on initial distribution, and 2,000 titles of serials are on subscription.

The Redstone Purchasing and Contracting Office worked out arrangements that permitted the Center to use one of its charge accounts for this purpose. Publishers were carefully screened for quality and quantity of scientific and technical books, and the largest was retained on a special charge account.

Initially 30 publishers were selected and others have been added from time to time. Regrettably, it was stated, foreign publishers had to be excluded because of the mechanics imposed in conforming to the "Buy American" policy. It is hoped that similar arrangements can be worked out with foreign publishers.

The Redstone Center decided it would be a good policy to request all publishers to furnish two copies of each title on approval, with the privilege of returning one or both copies. The provision for returning one copy is important. A few major reference books and certain basic but fringe-subject books are needed in single copies, to be kept on the shelf, and extra copies for circulation are not needed.

Of the first 565 volumes received, 300 were of different titles and only 43 titles were returned. Rejected titles fall mainly in two categories—they are not new or they are of too low a subject level. Few are returned as out of scope. Most of those rejected as not of sufficiently high level for R&D missions can be found in a good public library.

The subjects selected for Drop Shipment at the Center are: General—missile R&D, space science and technology, science or general language dictionaries and glossaries; mathematics, including computers; physics, including astronautics, astrophysics, geophysics, meteorology, fluid mechanics, acoustics, optics, solid state physics, and nuclear physics; chemistry; engineering and technology, including aeronautics, chemical engineering and technology, communications, electrical engineering, electronics, mechanical engineering, metallurgy and nucleonics.

Among advantages of the plan are: it permits selection by examining the books, thereby coping with the fact that titles and announcements may be deceptive or misleading; new books are received as soon as printed; order cards and orders do not have to be typed; publishers' advertisements do not have to be closely studied—only scanned for titles which will be needed in quantity; certain outstanding books within the Redstone Center's particular field of interest can be more carefully culled.

Army Testing New Method Of Oral Cancer Detection

A novel technique promising a simple, painless and rapid means of checking large groups for early or developing oral cancer will be tested at five basic Army Training centers this summer to evaluate its effectiveness for Army recruits.

Known as exfoliative cytology, the method uses small samplings of surface cells from questionable areas seen in the mouths of recruits at their first Army dental examination. Samples will be sent to the U.S. Army Institute of Dental Research, Washington, D.C., to be examined by experts in the field of oral cancer.

The study is the first of this type and scope to be conducted on a population of young adults of military age. It is part of a campaign of preventive dentistry launched by Maj Gen Joseph L. Bernier, Chief of the Army Dental Corps, as a means of improving the dental health of Army personnel and their families.

Training centers participating in the study are Fort Polk, La., Fort Ord, Calif., Fort Knox, Ky., Fort Dix, N.J., and Fort Jackson, S.C.

REDSTONE VISITOR Maj Gen Roger St. John, Commander, British Army Staff, Wash., D.C. (right) and Brig Gen H. P. Persons, Jr., Deputy Commanding General, Army Missile Command (left) pay respects to two flags during recent honor guard ceremony at Redstone Arsenal. Escorting officer is 1st Lt P. L. Barney, 291st M.P. Co., Army Missile Support Command. Following the ceremony, the visitor was briefed on the organization and mission of the Command before touring facilities at the Arsenal.

Army Medic Directs AFIP, Succeeding Air Force Man

Col Joe M. Blumberg, nominated recently for brigadier general rank, is the new Director of the Armed Forces Institute of Pathology (AFIP), succeeding Col Frank M. Townsend, U.S. Air Force.

A noted Army medic certified by the American Board of Pathology in anatomic, clinical and forensic pathology, Col Blumberg will direct the central laboratory of pathology for the Department of Defense. The laboratory also services other Federal agencies.

Graduated with an M.D. degree from Emory University, in his hometown of Atlanta, Ga., in 1933, he interned and served a residency in Baltimore, Md. He remained there to practice medicine from 1936-41, concurrently serving as an instructor in clinical pathology at the University of Maryland.

Commissioned in the Officers Reserve Corps in 1935, he was chief of the laboratory service at the Station Hospital, Fort Eustis, Va., and at the 115th General Hospital from 1943-45, serving in England, France and Germany. He joined the AFIP in 1945, and from 1946-50 was Chief of the Laboratory Service and Histopathology Center at the Oliver General Hospital, Augusta, Ga.

Following four years at Walter Reed General Hospital, he became commanding officer of the 406th Medical General Laboratory and consultant to the Chief Surgeon, Army Forces, Far East. He served in that position until assigned in 1957 as Deputy Director, AFIP.

Contributor to several books and author of many published technical papers, he is a founding Fellow of the College of American Pathologists and a member of several medical societies. By virtue of winning the Stitt Award in 1961, he is a life member of the Association of Military Surgeons. That same year he won the Hektoen Medal awarded by the American Medical Association.

Col Joe M. Blumberg

Col Frank M. Townsend

Maj Gen Sutton Recalled To Command Army Reserve

Maj Gen William J. Sutton has been recalled to active duty and appointed Chief, Army Reserve, effective Aug. 31. He will succeed Maj Gen Frederick M. Warren, who is retiring from active service.

General Sutton's current Reserve mobilization assignment is Assistant Deputy Commanding General for Reserve Forces, Headquarter, Continental Army Command, Fort Monroe, Va.

In September 1949 General Sutton terminated his active duty service to enter private business as an insurance executive and was appointed a colonel, USAR. During World War II, he served in the European Theater of Operations.

Assignments included Regimental Commander, 334th Infantry Regiment; Commanding Officer, 38th Infantry Regiment and Assistant Chief of Staff, G-2; Headquarters U.S. Constabulary in Europe. On his return to the U.S., he served as Chief, Training Branch, Intelligence Division, Army General Staff.

APG Vet Wins Recognition From Engineering Institute

Development and Proof Services, Aberdeen Proving Ground, Md., announced May 24 that the Institute for the Certification of Engineering Technicians had recognized a veteran employee.

Malcolm A. Reynolds, a 23-year employee of D&PS, Automotive Division, was designated an Engineering Technician, one of the three grades certified by the Institute on the basis of experience and performance.

The National Society of Professional Engineers established the Institute as an examining body to provide recognition for engineering technicians who were judged indispensable and who assumed important roles in the engineering profession.

Reynolds interrupted his service with D&PS during World War II for service with the U.S. Army as a tank commander in Europe, where he earned a battlefield commission. In 1950, during the Korean War, he was recalled to active duty as a first lieutenant and served until 1952. On his return to D&PS, Reynolds' combat experience made him a valuable employee in the field of tank armament.

Veteran Statesman McCloy Wins 1963 Thayer Award

John J. McCloy, Chairman of the General Advisory Committee on Disarmament, received the Sylvanus Thayer Award of 1963 in a May 25 ceremony held at West Point, N.Y.

Presented by the Association of Graduates of the U.S. Military Academy, and named after the Academy's superintendent from 1808 to 1833, the award cited Mr. McCloy for having "advanced the country's welfare in peace and in war by his oustanding leadership."

For more than 45 years a soldier, lawyer, banker and statesman, the former High Commissioner of West Germany told the assembled cadets that "the plain fact of the matter is that modern warfare and the threat of modern warfare are such all pervading features of our modern life that no single school or group can or should be treated as the exclusive high priests of the art."

He added that consideration had to be given to "all serious and differing points of view" to overcome the real danger of having "too much doctrinaire and partisan thinking applied to the subject." The veteran of many diplomatic confrontations of the Cold War declared that the chief problem facing the U.S. and the world is how to avert destruction "without loss of self-respect or impairment of the country's vital interest."

Committee Reviews Army Food Irradiation Progress at Natick

The Joint Congressional Committee on Atomic Energy reviewed the progress of the Army's food radiation preservation program in a recent visit to the U.S. Army Radiation Laboratory in Natick, Mass.

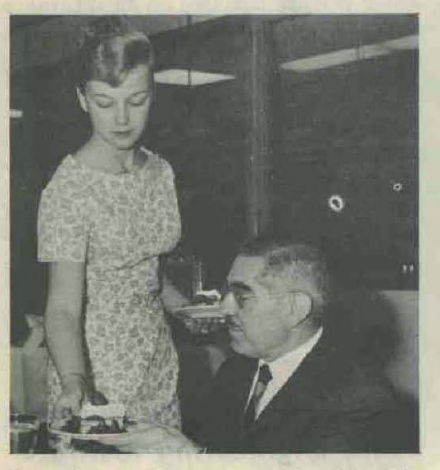
During their first tour of the Army's new facility for preserving food by ionizing energy, members were served a luncheon menu featuring a variety of foods preserved by radiation.

Included among the irradiated foods were assorted hors d'oeuvres such as shrimp and ham, chicken breast on ham slices, parslied potatoes, butterfly rolls and strawberry shortcake baked with irradiated flour and fruit.

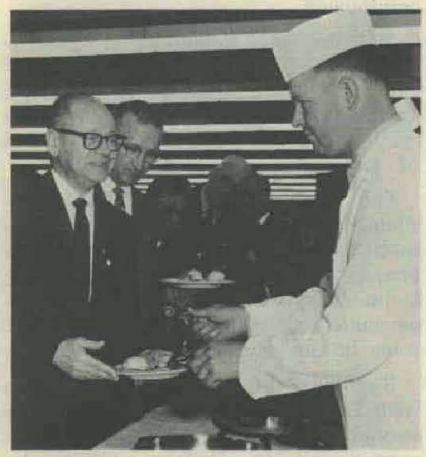
The group's visit coincided with the submittal to the Food and Drug Administration of the Army's second formal petition for clearance of an irradiated food item—white potatoes irradiated at 10,000 rads to inhibit sprouting during storage.

Earlier this year, fresh bacon was cleared for unrestricted consumption by the FDA, heralding the advent of this totally new form of food preservation and climaxing the Army's food research program luanched 10 years ago and supported since its inception by the Committee.

Committee Chairman Senator John O. Pastore (R.I.) presided at a formal hearing which reviewed the Army's food irradiation research progress to date, and discussed future plans and programs.



Strawberry shortcake made of irradiated fruit and flour is served to Senator John O. Pastore, Chairman, Joint Congressional Committee on Atomic Energy, by Mrs. Janice McGee during Committee's visit to Natick.



Luncheon of irradiated chicken, ham and potatoes is served to Senator Carl T. Curtis (Nebr.) Behind him are Dr. Dale H. Sieling, Natick Scientific Director; Dr. Ralph G. H. Siu, AMC Headquarters; and Brig Gen Merrill T. Tribe, Commanding General, Quartermaster R&D Center.

Dr. Edward S. Josephson, Associate Director for Radiation Preservation of Food, U.S. Army Radiation Lab., Natick, Mass., explains the radiation process to members of the Joint Congressional Committee on Atomic Energy, Congressman Jack Westland (Wash.), background, Congressman William H. Bates (Mass.), Senator John O. Pastore (R.I.), background, Senator Carl T. Curtis (Nebr.), and extreme right, Congressman Craig Hosmer (Calif.).

$1,299,630 Awarded for Data Retrieval System

A $1,229,630 contract for a data retrieval system that will allow the selection and reproduction of any one of 400,000 missile drawings in a matter of minutes was announced May 29 by the Army Missile Command, Redstone Arsenal, Ala.

The contract is with the Magnavox Co. in Fort Wayne, Ind., and 22 months were allowed for delivery.

Called the Automated Engineering Drawing Storage and Retrieval System, it will store missile system documentation drawings on film "chips."

An operator can obtain any drawing by placing a coded punch card in the system or typing the drawing reference number directly into the system. The drawing is transferred photographically from the film chip to an aperture card. The processing takes about 60 seconds.

An aperture card is a punch card with an insert of photographic film. Once the reproduction is completed the film chip is returned to the file and the requestor gets the aperture card. From it he can print blownup copies of the drawing or view it on a projector.

The contract will be administered by the Missile Command Directorate of Procurement and Production. The system will be a part of the Directorate's Documentation Branch.

The Directorate said that at present it has a master file of about 1½ million engineering drawings of missile parts and assemblies that are in frequent demand. These drawings are filed on aperture cards.

The card on a particular drawing may be in demand by several persons at one time. Often the drawing is required at a contractor's plant or other installation.

The new system will remedy this by not only providing fast access to any drawing, but also providing an unlimited number of aperture cards containing the drawing.

Secretary of Army Announces Reassignment, Retirement of General Officers

Secretary of the Army Cyrus R. Vance recently announced new assignments and retirements of Army general officers of interest to the Army R&D community.

Maj Gen James D. Alger, formerly Commanding General, II Corps, Camp Kilmer, N.J., was reassigned to the Office, Deputy Chief of Staff for Military Operations, Washington, D.C., effective in May.

Maj Gen Ralph E. Haines, Commanding General, 1st Armored Division, Fort Hood, Tex., has been assigned to the Office of Assistant Chief of Staff for Force Development, Washington, D.C., effective this month.

Maj Gen Harvey J. Jablonsky, Director of Officer Personnel, Office of Personnel Operations, Washington, D.C., was reassigned to Headquarters, 1st Armored Division, Fort Hood, Tex., effective in May.

Maj Gen Rush B. Lincoln, Jr., Chief of Transportation, takes a new job this month with the Defense Supply Agency, Washington, D.C.

Maj Gen Edwin J. Messinger, Chief, Joint U.S. Military Mission for Aid to Turkey, has been assigned to the Office, Deputy Chief of Staff for Logistics, Washington, D.C., effective in September.

Big Gen Donald V. Bennett, Artillery Commander, I Corps, Eighth Army, Korea, has been reassigned to the Office, Deputy Chief of Staff for Military Operations, Washington, D.C., effective in September.

Brig Gen Kenneth F. Dawalt, Commanding General, 30th Artillery Brigade, (Air Defense), Ryukyu Islands/IX Corps, has been reassigned to the Defense Atomic Support Agency, Washington, D.C., effective in July.

Brig Gen Benjamin H. Pochyla, Deputy Director, J-6, Communications-Electronics Directorate, The Joint Staff, OJCS, Washington, D.C., has been reassigned to Headquarters, U.S. Army Electronics Proving Ground, Fort Huachuca, Ariz., effective in May.

Big Gen Selwyn D. Smith, Jr., Chief of Staff, Seventh U.S. Army, Europe, has been reassigned to Headquarters, U.S. Army Materiel Command, Washington, effective in July.

Maj Gen Thomas F. Van Natta, Director, Inter-American Defense College, Fort Lesley J. McNair, Washington, D.C., retired on May 31, after more than 34 years of active service.

Brig Gen James E. Graham, Personnel and Training, Office of the Surgeon General, Washington, D.C., retired from active service May 30.

Dr. Carr, Pharmacologist, Added to USARO Staff

Dr. Charles J. Carr recently joined the staff of the U.S. Army Research Office as Chief of the Scientific Analysis Branch, Life Sciences Division.

Known for his publications in neuro- and psychopharmacology, he has served since 1957 with the National Institute of Mental Health, National Institutes of Health, Bethesda, Md. Since 1960 he has been Chief of the Pharmacology Unit.

Dr. Carr earned a Ph.D. degree in 1937 from the University of Maryland where he was a research assistant to the Chairman, Committee on Inorganic Chemicals of U.S. Pharmacopeia, and an Emerson Fellow in pharmacology. Appointed instructor in 1935, he was promoted to professor in 1955.

From 1955-57 he served as Head of the Department of Pharmacology, Purdue University, and in recent years as a special lecturer on pharmacological research, School of Pharmacy, George Washington University, and visiting professor of pharmacology, School of Medicine, University of Maryland.

Covering several fields, his publications date back to reports he coauthored on substitute carbohydrates in the diet of man and animals. Later studies explored the effect of little-known sugars or sugar derivatives. He collaborated in inhalation anesthetics research which led to discovery of cyclobutane and vinyl ethyl ether, and resulted in the publication of 45 reports.

A member of many professional organizations, he has been recognized for his studies on the toxicology of chemical warfare agents and protective measures for Army Service forces during World War II, and for his public service in his native State of Maryland.

Dr. Charles J. Carr

Army Continuing Research On Electrical Anesthesia

Army research on electrical anesthesia (electronarcosis) is being continued under a new contract awarded recently to investigators at the University of California Medical Center at San Francisco.

Admittedly, however, problems have been encountered that may require extensive research to resolve, in contrast to the optimism that grew out of earlier investigations over a 4-year period. (See March 1961 issue, page 8.) The original researchers whose work was reported at that time, Dr. M. D. Turner and Dr. James D. Hardy, worked on the University of Mississippi staff.

Although the results were promising, as conducted on human patients after extensive testing on animals, Dr. Hardy was exceedingly reserved in his comments as to how soon the technique might be perfected sufficiently for civilian or military use.

The new contract, like that with Dr. Hardy and his associates, was awarded through the Army Medical Research and Development Command. The proposal on which it is based calls for modification of the method developed at the University of Mississippi, and involves a combination of alternating and direct current.

Specifications for the study over a 2-year period include blood acid base changes, electrical fields of the brain during and after electronarcosis, effects on muscle tone, optimal electronarcosis patterns, and effects.

Work is being done by a team headed by Dr. Robert Hudson Smith, assistant professor of anesthesia in Dr. Stewart Cullen's department at the U. of California Medical Center.

Electronarcosis is of interest to the Army Medical Service for many purposes but chiefly for application to field surgery under combat conditions. Potentially, it is believed applicable to a new field of neurophysiological investigations in man.

First Maryland Junior Science, Humanities Symposium Draws 300 Students

Dr. George Wald, Professor of Biology at Harvard University, discussed "The Origin of Life" as the major address at the First Maryland Junior Science and Humanities Symposium in Baltimore, Md.

Sponsored by the U.S. Army Research Office and the U.S. Army CBR Agency, the symposium, geared to "Research in Progress—Science in the Making," was conducted by the Maryland Academy of Sciences.

Scientists from the U.S. Army, industry and leading colleges and universities joined more than 300 students in the May 8-11 program of lectures, informal discussions, student paper presentations, and tours of local scientific establishments.

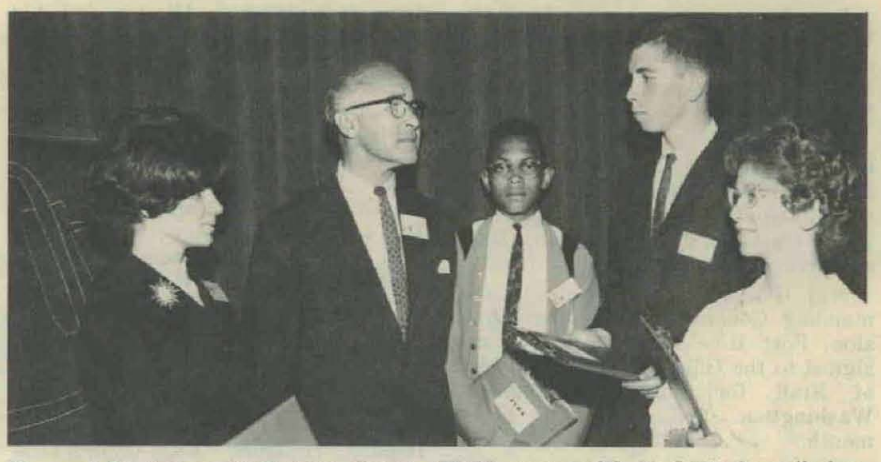
Dr. J. A. Hunter, President of the Maryland Academy of Sciences, welcomed conferees and Nigol O. C. Wolff, Academy Director, presided at the first 26 sessions, including:

"Biology in Relation to Other Sciences," by Dr. Gairdner B. Moment, Professor of Biological Sciences, Goucher College.

"Semiconductors and Transistors," by Julius H. Taylor, Chairman, Department of Physics, Morgan State College.

"Mathematics in the Space Age," by Dr. John W. Brace, Associate Professor of Mathematics, University of Maryland.

Dr. Thomas G. Pullen, Jr., Superintendent of Education, and Dr. Helen B. Taussig, Professor of Pediatrics at the Johns Hopkins University School of Medicine, were among the featured speakers.



Harvard Professor of Biology, George Wald meets with students in a "scientific skull session" at the first Maryland JSHS in Baltimore, Md. (L. to R.): Cindy Hansen, Wald, James Poe, John O'Leary, Ruth Ann Woodward.

The students who participated were selected on the basis of achievement in high school science programs.

APG Scientists Share Pride in Science of Scions

Three Aberdeen (Md.) Proving Ground fathers were proud this month when their 16-year-old daughters presented research papers at the Maryland Junior Science and Humanities Symposium.

Wendy Kuhn, Carol Hoffman and Virginia Wojcik, students at Aberdeen High School, presented three of 18 papers that were given, as screened from 78 submissions.

Wendy is the daughter of Dr. Lester P. Kuhn, Chief, Chemical Branch, Internal Ballistic Research Laboratory, U.S. Army Ballistics Research Laboratories. Carol's father is Dr. Charles W. Hoffman, Nuclear Physicist, BRL. Virginia is the pride of Lt Col Walter K. Wojcik, Project Officer, Nuclear Biological Chemical Testing, U.S. Army Test and Evaluation Command.

Some 230 student delegates from high schools in all 23 counties of the state, including the city of Baltimore, and more than 60 teachers took part in the gathering.

The program featured a series of 24 laboratory tours including Aberdeen Proving Ground's high-speed computing laboratories and wind tunnel facilities.

Virginia's topic was "Development of Walker Carcinosarcoma 256 In Rats And Treatment By Cortisone And Hydrocortisone Acetate." Margaret's project was "Fermentability of Sugar and Kinetics of Fermentation." A top-grade student, Carol will skip her senior year of high school to enter Massachusetts Institute of Technology under an early admissions program this September.

Carol's 5-year project is "Tenodera Aridifolia Senesis Tenodera Angustipennis—Two Maryland Mantids and the Factors Which Have Influenced Their Range."

The project consists of a classified collection of mollusca—sea shells—assembled from 20 beaches ranging from Florida to Cape Cod.

A tour of the U.S. Army Proving Ground at Dugway, Utah, highlighted a recent 3-day Junior Science Symposium in Salt Lake City for over 200 students from the five intermountain states of Utah, Nevada, Idaho, Colorado and Wyoming. Lt Lawrence D. Doff, Dugway information officer, is shown explaining an automatic diluting apparatus to (l. to r.) Frank J. Wentz, Clearfield High School, Utah; Brent Archibald, Idaho Falls H.S., Idaho; and April J. Voorhees, Olympus H.S., Salt Lake City, Utah. Rudolph Reese, science teacher at Provo H.S., Provo, Utah, listens to the orientation.

Picatinny Officer Claims Key Explosives Findings

New knowledge that conceivably could lead to full understanding of the precise mechanism of explosion is reported by Picatinny Arsenal, Dover, N.J., as Lt Gerald Glen's discovery.

Working as a physical chemist in the Explosive Research Section, Explosives and Propellants Laboratory, Lt Glen is reported to have succeeded in making an accurate determination of the nitrogen positions in the physical structure of a primary explosive —lead azide.

Results of his research were reported recently by Lt Glen at a seminar conducted at the California Institute of Technology, where he was introduced by Prof. Linus Pauling, Nobel Prize winner in chemistry.

All the early diffraction work on azide structures, the Picatinny Arsenal report stated, was done by Prof. Pauling and his students. (Azides are explosive inorganic compounds, and well-known as such, though the basic reason why they are explosive is still undetermined.)

Prior to Lt Glen's findings, attempts to locate the nitrogen positions from available data had yielded only approximate parameters for all atoms in the unit cell in a 3-dimensional X-ray analysis at Penn State University. L. V. Azaroff's investigations determined the lead position from X-ray diffraction. Brookhaven Laboratory investigators Danner and Kay collected Lkl neutron diffraction data, the Picatinny report said.

Lt Gerald Glen

Using all the information on those investigations, Lt Glen set up a 2-dimensional Fourier analysis with gratifying results. The credibility of the structure proposed at Penn State has been established, it was stated, and the Y- and Z-coordinates have been partially refined.

Still, it was stressed, it will be difficult to get a complete refinement neutron scattering density projection with the present data since the Okl is heavily overlapped.

Other properties may better explain the explosive nature of the azides, though it has been shown in many instances that the physiochemical behavior of a material can be understood fully only when its crystal structure is accurately known.

Graduated with a B.S. degree from The Citadel, Charleston, S.C., where he earned his football letter while still a sophomore, Lt Glen did graduate work at Cornell University and won a Ph. D. degree in physical chemistry at the age of 27.

WRAIR Conducts Seminar to Discuss Shock Concepts

"Some Current Concepts and Enigmas of Shock" was discussed at the monthly staff seminar, May 29, at the Walter Reed Army Institute of Research (WRAIR).

Dr. Albert Einheber, Chief, Department of Germfree Research, Division of Basic Surgical Research, stated that the pathogenesis of irremediable ("irreversible") shock is incompletely known and its nature controversial.

In the event of nuclear disaster, he said, "irreversibility" may pose an unprecedented clinical problem because of unavoidable delay in treatment of casualties, multiplicity of injuries likely to be incurred, and the superimposed deleterious effect of radiation on the "normal" response to trauma and infection.

As part of its continuing program of research, WRAIR has been investigating the possible role in shock of bacteria and their products using germfree and conventional animals, the influence of low-lethal whole-body X-irradiation on subsequent tolerance for trauma, and effect of radioprotectants on resistance to trauma.

Findings to date show that: no blood-borne lethal toxin occurs in irreversible hemmorhagic or fatal bowel-ischemia shock; animals free from viable bacteria die in shock; there is a decrease in shock resistance to injury imposed during the second, but not during the first or third week post-irradiation; and a decrease in resistance to trauma after treatment with a radioprotectant.

Discussion following the principal presentation was moderated by Dr. Emil Blair, assistant professor of surgery, Director, Thoracic and Cardiovascular Research, University of Maryland Hospital School of Medicine, Baltimore, Md.

Navy Reorganization Under Way

The initial major step in an administrative reorganization of the Department of the Navy took place this month with the title of Chief of Naval Support added to the responsibilities of Vice Adm William A. Schoech, Chief of Naval Materiel.

To the Naval Materiel Office, now concerned primarily with production and procurement, will be added responsibility for development, test and evaluation of new materiel. Further reorganization affecting the other naval bureaus is anticipated, but is not scheduled in the near future.

SCIENTIFIC CALENDAR

Round Table on the Fluid Dynamic Aspects of Space Flight and their Representation on the Ground, sponsored by NATO and the Advisory Group for Aeronautical R&D, Athens, Greece, July 8-9.

Unimolecular Reactions in the Mass Spectrometer and Related Topics, Salt Lake City, July 8-10.

6th International Conference on Ionization Phenomena in Gases, sponsored by the International Union of Pure and Applied Physics, Orsay, France, July 8-13.

Seminar in Unified Theories of Elementary Particles, sponsored by AFOSR and AEC, Rochester, N.Y., July 8-26.

International Symposium on Space Telecommunications, sponsored by IEEE and the Professional Group on Antennas and Propagation, Boulder, Colo., July 9-11.

Conference on High Magnetic Fields, their Production and their Applications, sponsored by the Institute of Physics and The Physical Society, Oxford, England, July 10-12.

2nd Pan American Conference on Soil Mechanics and Foundation Engineering, Sao Paulo, Brazil, July 14.

5th International Pesticides Congress, sponsored by the International Union of Pure and Applied Chemistry, London, England, July 17-23.

Symposium on Thermodynamics and Thermochemistry, Lund, Sweden, July 18-23.

International Meeting of the Biochemical Society, Oxford, England, July 19-20.

5th International Conference on Medical Electronics, Liege, Belgium, July 21-27.

3rd Conference on the Physics of Electronic and Atomic Collisions, London, England, July 22-26.

Symposium on Microscopy, Brighton, England, July 22-26.

Symposium on Global Impact of Applied Microbiology, Stockholm, Sweden, July 29-Aug. 3.

International Conference and Exhibit on Aerospace Support Equipment, Washington, D.C., Aug. 4-9.

International Conference on Lattice Dynamics, sponsored by the International Union of Pure and Applied Physics, Copenhagen, Denmark, Aug. 5-9.

Symposium on the Results of the International Geophysical Year, Los Angeles, Aug. 12-15.

5th Biennial Gas Dynamics Symposium: "Physico-Chemical Diagnostics of Plasmas," Evanston, Ill., Aug. 14-16.

2nd International Pharmacological Meeting, sponsored by AFOSR and the International Union of Physiological Sciences, Prague, Czechoslovakia, Aug. 20-23.

Redhead/Roadrunner Passes WSMR Altitude Tests

The first supersonic high-level evaluation mission of the U.S. Army's Redhead/Roadrunner target missile was successfully completed May 23 at White Sands Missile Range.

The Army Missile Command at Redstone Arsenal, Ala., announced that the missile flew a straight up-range course and reached an altitude of 41,000 feet and speed of Mach 2.4 —over twice as fast as sound.

Safely returned to the ground by its self-contained parachute/retro-rocket recovery system, the target missile can be flown again.

The Redhead/Roadrunner was launched by a more powerful booster rocket, produced by North American Aviation's Rocketdyne Solid Rocket Division, McGregor, Tex. It utilizes Rocketdyne's advanced solid propellant, Flexadyne, and has approximately twice the total impulse of the booster previously used for launching subsonic missions.

The high-level mission May 23 completed another in a series of prescribed evaluation flights in the test program, the Army said. The Redhead/Roadrunner has flown numerous other test flights since its first firing in March of 1961, including a low-level Mach .95 Roadrunner evaluation flight at 350 feet above the terrain last fall.

The missile is designed to fly from 300 to 60,000 feet in altitude and from subsonic to Mach 2 speeds. Controlled by electronic signals from a ground command station, it can perform various turns and maneuvers.

The Redhead/Roadrunner is 22 feet long and a foot in diameter. It has triangular wings and a pair of small movable control fins mounted to the rear of the missile body. Launched from the ground, it is sustained in flight by a ramjet engine built by the Marquardt Corp.

When development of the Redhead/Roadrunner is completed it will be used principally to stimulate high performance aircraft and air-breathing missiles for troop training and research and development missile frings.

Development is under the technical supervision of the Missile Command.

Lt Col Scarborough Joins OCRD Plans Division

Lt Col George D. Scarborough recently joined the staff of the Office of the Chief of Research and Development as a staff officer in the Plans Division. He previously served a 3-year tour in Germany as commander, 2/25th Artillery, Target Acquisition Battalion, and as S-3 VII Corps Artillery.

Commissioned in 1942, he served throughout World War II in the European Theater of Operations, winning five battle stars. He left the Army for a brief period to enter private business and returned to active duty in 1948, serving a 4-year tour in Germany as artillery battalion S-3 and artillery group S-3.

Other recent assignments include serving as an instructor in the Fire Support Tactics and Combined Arms Department of the Artillery School, Fort Sill, Okla.; Plans Officer, I Corps Artillery, Korea; and U.S. Army Artillery Board, project officer on target acquisition devices.

Lt Col George D. Scarborough

Mobile Repair Van Supports Sergeant Missile Firings

A mobile electronic maintenance van designed for general support of the Sergeant missile arrived last month at the Army Ordnance Guided Missile School, Redstone Arsenal.

Called the General Support Shop Set, and currently being used for training, the 30-foot air-conditioned semitrailer was built at the request of the U.S. Army Missile Command as an interim facility to be used in repair of Sergeant subassemblies.

Extremely complex components of the missile assemblies, the subassemblies serve as their electronic nerve centers. The assemblies are used to test, evaluate, program and fire the Sergeant missile. Approximately 325 subassemblies in about 60 assemblies can be tested and repaired with the equipment on the van.

The repair procedures on the subassemblies were developed in the Sergeant Engineering Section at White Sands Missile Range, N. Mex., and their techniques will be taught at the Redstone Guided Missile School.

Following its arrival at Redstone, demonstrations and briefings on the Shop were given to Col J. Mort Loomis, Jr., Sergeant Project Manager; Col W. J. Macpherson, Commandant, Ordnance Guided Missile School; and Col W. F. Register, Deputy Commander, Army Missile Support Command.

Others attending were J. H. Draughon, Sergeant Deputy Project Manager; Col Hans Fink, Liaison Officer, Free Republic of Germany; H. T. Nagle, Sergeant Support Division; T. C. Faulkner, Sergeant Tools and Test Equipment Section; and L. R. Starkey, Equipment Specialist.

FRENCH OFFICIALS are greeted during visit to U.S. Army Missile Command, Redstone Arsenal, Ala., by Maj Gen Francis J. McMorrow (center), Commanding General. At left is Brig Gen Louis Bealieu, CG, Anti-Aircraft Artillery School for French Army. At right is Lt Gen Pierre Renauld, Inspector of Armament Programing and Manufacturing of French Armed Forces, equivalent of U.S. Army's Chief of Research and Development.

U. S. Army Office of Special Weapons Renamed

Redesignation of the U.S. Army Office of Special Weapons early in May gave the Army's oldest separate combat developments agency a new name of USACDC Nuclear Group. It continues as one of six major subordinate commands of the U.S. Army Combat Developments Command.

Organized in December 1952, the OSW played a key role in the Army's combat developments, under the Chief, Army Field Forces, U.S. Continental Army Command.

One of 30 separate Army combat developments activities centralized by Army reorganization in 1962 under Headquarters, USACDC, the Nuclear Group at Fort Bliss, Tex., is principal focal point for objectives and concepts relating to nuclear energy weapons as they affect the Army.

The appearance of tactical nuclear weapons in the Army's arsenal, it was stated, has created the need for this distinctive agency to assure that such weapons be not only safe, but as simple and reliable to use and maintain as conventional weapons.

In addition to providing guidance on the development and production of "field-ready" nuclear weapons for Lt Gen John P. Daley's Combat Developments Command, the Nuclear Group, commanded by Col Arthur L. Sanford, defines the conditions and experiences to which nuclear weapons will be subjected during storage, handling and combat operations.

To meet these requirements the Group prepares a "stockpile-to-target-sequence" which clarifies for the developers the various environments Army's nuclear weapons must endure.

To assure realistic training in nuclear weapons by the modern field soldier, the Nuclear Group advises Army commanders on nuclear safety and "play" in maneuvers, exercises and troop tests.

One of the group's significant unclassified accomplishments has been the simplification battlefield nuclear target analysis. A previous complex series of mathematical computations has been refined to extract an index number from a pre-computed and preprinted table showing effectiveness of comparative weapons.

To impart realism into war games and maneuvers, the nuclear specialists have developed a method of quickly determining results and accurately assessing damages of simulated nuclear strikes. The Army's oldest separate CD agency with the new name is helping the developmental staff at Fort Belvoir, Va., find answers to one of the Army's oldest 3-part questions which identifies the USACDC mission:

"How should the Army—now and in the future—be organized, equipped and fight?"

Historic Cannonball Rates Top Interest in Museum

Among 13,711 exhibits of death-dealing destruction at the U.S. Army's Picatinny Arsenal Ammunition Museum at Dover, N.J., a relic of the 17th century receives the most attention from about 15,000 visitors annually.

An 18-pound cannonball fired from the ship of Sir Henry Morgan, the infamous English buccaneer, when conquering a Spanish fort on the coast of Panama in 1670, steals the show from an impressive display of modern weapons—massive projectiles, rockets and bombs of foreign and U.S. design.

Many of the exhibits shown to the public May 18 on Armed Forces Day are battleground recoveries of ammunition used in the American Revolutionary War and subsequent conflicts up to the Korean War. Historians, engineers, scientists, career soldiers and students can view a "veritable treasury of man's ingenuity to perfect weapons of defense and annihilation.

Museum Curator Harry Bullock examines Civil War rifle displayed among 13,711 exhibits at Picatinny Arsenal Ammunition Museum.

The Museum's limited area does not permit the showing of every type of ammunition used in wars, when one considers 270 kinds were employed in the Korean War.

Harry H. Bullock, Museum Curator and his assistant Thomas C. Cavanaugh, aside from conducting guided tours, are constantly answering mail inquiries.

Typical was a question from Walt Disney, asking if antipersonnel mines were used in the Civil War. First used by the Confederate army, they were later outlawed, by mutual agreement, as being an "inhuman type of warfare."

Top military personnel from all over the world are regular museum visitors. Unlike the casual sightseer, they usually spend hours of absorbed study over exhibits of modern, conventional ammunition and those used in previous wars.

Enthusiasm of Bullock and Cavanaugh never wanes in answering stock questions, "what's the biggest . . . what's the smallest?" Answers direct attention to the 12,000-pound demolition bomb and the tiny, fully completed round weighing less than one ounce.

The Museum functions as a research lab for outside contractors to study basic trends in ammunition design. It is also a classroom for newly employed Arsenal engineers who attend a 4-hour orientation course in ammunition development under the tutelage of Bullock and Cavanaugh.

WSMR Agency Converts To Metric Measurements

A change to the metric system of measurement in meteorology has been announced by the Army Electronics Research and Development Activity at White Sands Missile Range.

The changeover from measurement in inches, feet and miles to centimeters, meters and kilometers involves recalibration of a large number of instruments. A meter is equal to 39.37 inches.

The change fulfills a recent Department of the Army regulation requiring that all meteorological measurements, as well as weapons systems calibrations, be expressed in metric form as used in measurements made by scientists all over the world. The U.S. is one of the last countries to adopt metric measurements.

Rapidly accelerating and expanding American technology will move into the metric system during the next two years. Maximum use will be made of existing instruments and new instrumentation will be calibrated in metric scale.

Metric measuring has been used during the development of meteorological rocket firing networks by the Army Electronics R&D Activity, and the phasing into the more precise system in other atmospheric recording devices will soon be completed.

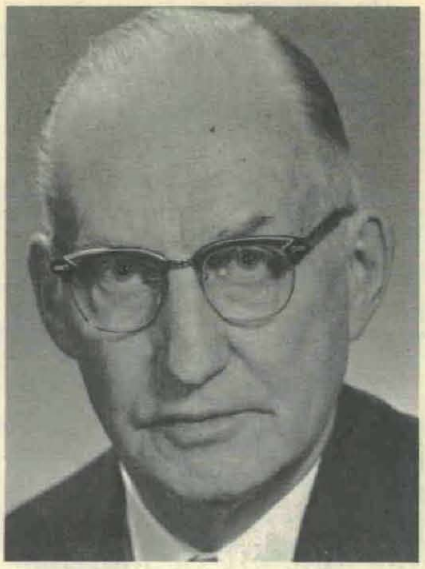
Electronics R&D Activity Selects Chief Scientist

Appointment of James J. Lamb as Chief Scientist of the U.S. Army Electronics Research and Development Activity, Arizona (USAERDAA), Fort Huachuca, has been officially confirmed.

Department of the Army approval of the PL-313 position was announced this month by Col William Hupalo, USAERDAA commander, whom Mr. Lamb serves as principal adviser in scientific affairs.

USAERDAA is a subordinate unit of the United States Electronics Command, Fort Monmouth, N.J., and is composed of three principal departments: Automatic Data Processing (ADP), Electronics, Meteorology.

As Chief Scientist of the Activity, Lamb has technical responsibility in executing advanced R&D programs in tactical ADP, communications, electronic warfare, avionics, combat surveillance and micrometeorology.



James J. Lamb

A pioneer in the field of electrical engineering and radio communications, he is the author of more than 65 technical papers, magazine articles, and encyclopedia contributions. He holds six patents in the fields of radio transmission, receiver noise suppression, and television. A patent pending in data processing concerns a Character Recognition System and was filed in his behalf by the Sperry Rand Corp.

Lamb came to Fort Huachuca in 1959 as a member of the technical staff of the Ramo Wooldridge Division of Thompson Ramo Wooldridge, a contractor in the Army's Automatic Data Processing Project. In 1961 he was appointed Scientific Adviser-Director of the Signal Communications Department, USAEPG.

With the reorganization of the Army in the late summer of 1962, certain functions of the Signal Communications Department were absorbed by the Electronics Research and Development Activity, Huachuca (ERDAH) and Lamb was designated Chief Scientist of the Activity.

Before coming to Fort Huachuca, he was with Sperry Rand, Inc. as Director of Electronic Research and Senior Staff Consultant of the UNIVAC Division Laboratory, Norwalk, Conn. Earlier, he organized and managed the company's Electronic Division at Middletown, Conn., serving as its Chief Engineer.

Earlier he was with the American Radio Relay League (ARRL) for 12 years as technical editor of the monthly journel, QST, and other publications. His well-known by-line has appeared as coauthor of several editions of the ARRL Radio Amateur's Handbook and the ARRL Manual.

Lamb acquired his education in electrical engineering at the University of Minnesota and the Catholic University of America, Washington, D.C., where he earned a B.S. degree. He studied law at Georgetown University, industrial management at the University of Connecticut, and is a Registered Professional Engineer in Connecticut. He is a native of Michigan City, N.D.

A Fellow of the Institute of Radio Engineers and of the Radio Club of America, he is a member of the Armed Forces Communications Electronics Association.

Maj Gen William J. Ely, Deputy Commanding General, U.S. Army Materiel Command (center), and Col Walter J. Hewitt, R&D Directorate, USAMC (right), examine test models of Message Entry Device (MED) and Forward Area Display Unit (FADU) during recent tour of the U.S. Army Electronics Research and Development Activity at Fort Huachuca, Ariz. A display of BASIPAC and MOBIDIC computers, used in systems development as a part of USAERDAA's support for the CCIS-70 Project's mission of automating certain functions of the field army, was included in the tour. At left of General Ely is Lt Col Anderson Q. Smith, CCIS-70 Project Manager and Maj Glenn R. Jackman (far left), Chief, Systems Design Division.

Army Medics Give Support To Cooper's Space Flight

More than 20 Army Medical Service personnel were available to render professional and technical assistance when Maj L. Gordon Cooper, Jr., USAF, made his 22-orbit, day-and-a-half journey into space.

Lt Col John A. Sheedy, MC, the Army Surgeon General's representative for NASA's Project Mercury, said personnel and facilities from two Army hospitals, Walter Reed General Hospital and the U.S. Army Hospital, Ryukyu Islands, provided medical support for the flight. Also on hand from Brooke (Tex.) General Hospital were the Burn Management Team and the Renal Management Team.

As in previous flights, personnel were assigned to monitoring stations located at strategic points throughout the world, as well as on recovery vessels equipped to meet Maj Cooper.

Always Brewing Something New

Redstone Researcher Evaluates Missile Mixtures

Always brewing something new applies to Clay Howard in the Propulsion Laboratory of the Research and Development Directorate at the Army Missile Command, Redstone Arsenal.

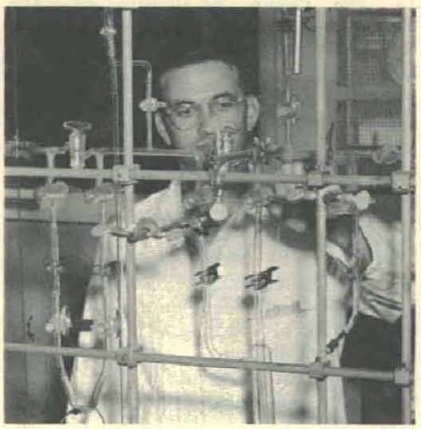
As a basic research chemist working with polymers to bind explosive mixtures and propellants for the Army's missile motors, his immediate boss is Exploratory Group Chief Chester Huskins.

Howard earned his bachelor's and master's degrees in chemistry at Peabody college with every intention of becoming a teacher. Then he became interested in the science of missilry. He also became interested in the girl destined to be his wife. They moved to Huntsville in 1957.

By 1962 the Howards decided to engage in farming along with Clay's father—raising Hereford cattle. The herd is growing and so are their two sons, Clay, Jr., 6, and Gary Wayne, 2. Howard commutes between his present home in Pulaski, Tenn., and his job at the Missile Command.

Howard evaluates propellant ingredients, fuels, oxidizers and new compounds, studies the compatibility and reliability of mixtures, and interprets his findings.

Some of the work is done through infrared and mass spectographic analysis. He says he is glad that the job is variable and that he has the opportunity to set up systems to mix higher energy compositions and help produce better propellants—one among many giant strides of missile technology.



Clay Howard sets up missile mixture test behind maze of test tubes at the Propulsion Laboratory, Directorate of R&D, U.S. Army Missile Command.

The laboratory is working more and more with remote control equipment when mixing new compositions. The analysis is also necessarily by remote control. Even with nothing brewing, everyone enters the laboratory wearing safety glasses.

Howard believes in combining the same business ethics to missiles as to cattle and his boys—good management brings a profit!

NUNS, representing one of 57 public, independent and parochial schools participating in Picatinny Arsenal's (Dover, N.J.) third Student Science Symposium, examine aerodynamic model used in wind tunnel tests. Richard Bradford of the Arsenal staff chats with the sisters during recent 2-day meet which attracted 250 students, teachers and guests.

QMREC Bibilography Lists Reports on Earth Sciences

A bibliography of all earth science reports published at the Quartermaster Research and Engineering Center, Natick, Mass., is now being distributed to Government agencies, military installations, and libraries.

The 58-page Technical Report ES-1 was compiled by the Center's Earth Sciences Division. It lists reports from 1942, when the Quartermaster Corps program started, covering geography and its subfields, including climatology, geomorphology and biogeography of plants and animals, including man.

The bibliography is intended as a practical index to the amassed knowledge in earth sciences represented by the reports. It serves in answering requests for information by governmental, academic and professional organizations and individuals.

By Ralph G. H. Siu

ARTISTIC MATURITY. Why some researchers should be temperamental to the extent of downright disagreeableness is a puzzle to many executives. G. K. Chestertown tried to throw some light on the subject. He said:

"The artistic temperament is a disease that afflicts amateurs. It is a disease which arises from men not having sufficient power of expression to utter and get rid of the element of art in their being. It is healthful to every sane man to utter the art within him; it is essential to every sane man to get rid of the art within him at all costs.

"Artists of a large and wholesome vitality get rid of their art easily, as they breathe easily, or perspire easily. But in artists of less force, the thing becomes a pressure, and produces a definite pain, which is called the artistic temperament. Thus, very great artists are able to be ordinary men—men like Shakespeare or Browning.

"There are many real tragedies of the artistic temperament, tragedies of vanity or violence or fear. But the great tragedy of the artistic temperament is that it cannot produce any art."

CAN DO. There has been much discussion recently about insuring freedom to the creative person. What he should do with that freedom, however, has not always been clear. The comment of the great painter Ingres (1780-1867) bears on the question:

An artist of talent paints what he pleases; an artist of genius paints what he can.

Ingres recognizes that to paint as one pleases does give pleasure to the painter. But if that is all there is to painting, the work of art becomes merely a therapeutic exercise. To provide something deeper, the creative person needs, as one art critic puts it, "to reveal himself, in order to come closer to revealing the world, and to know the world through knowing himself. That is why Ingres gave so restrictive a reason to artists who are great. They can only do what they do."

THE WORRIED LOOK. It has been said that "A good executive is a person who goes around with a worried look on his assistant's face."

AMC Effects Changes in Industrial Information Program

Substantial improvements in the U.S. Army Materiel Command scientific and technical information program are being made by consolidation and coordination of related programs for keeping industry informed about research and development requirements.

Five programs established by the Technical Services and the Office of the Chief of Research and Development have been consolidated into three areas of effort.

Uniform policy has been applied to combine the U.S. Army R&D Problems Guide, the Qualitative Developments Requirements Information, and the Army Study Requirements into a single program. The revised approach is patterned along the lines of the Qualitative Developments Requirements Program established in 1958 by the Ordnance Corps.

Army support to the National Inventors Council and its brochure, "Inventions Wanted by the Armed Forces and Other Government Agencies," will be continued on an expanded basis.

Army support of the Unfunded Study Program will continue with essentially no change under Army Materiel Command monitorship.

Unclassified information on Army research and development requirements listed in previous years in the Problems Guide is to be presented in the National Inventors Council brochure due off the press in July.

Until the Army reorganization assigned the bulk of the materiel functions of the Technical Services to the Army Materiel Command, headed by Lt Gen Frank S. Besson, Jr., the Problems Guide was an 8-volume edition. One volume was published by each of the seven Technical Services and an unclassified volume on supporting research was consolidated and prepared by the U.S. Army Research Office, Office of the Chief of Research and Development.

Early in June the AMC announced that the NIC brochure will be used as the major means of disseminating unclassified Army problems on which assistance of the general scientific community is invited. About 60,000 copies of the NIC brochure are distributed by the Department of Commerce to educational institutions, industrial and other research groups.

Classified R&D problems, it was stated, will be published in a new Qualitative Development Requirements Information (QDRI) series to be published as separate volumes by each subordinate command of the Army Materiel Command. Supplementing these will be a volume on basic and supporting research to be published by AMC Headquarters with Army Research Office assistance.

QDRI volumes will be published as requirements develop rather than at specified intervals. The current classified volumes of the Problems Guide published in 1961 will remain in effect, as amended, until the QDRI brochures are available.

Consolidation of unclassified R&D problems in the NIC brochure, it was stated, will be accompanied with a thorough selective screening to eliminate duplication and overlapping found in the various volumes of the Problems Guide. The work is being done under supervision of Maj Russell J. Lamp, Chief of the Support Branch, Technical Service Division, R&D Directorate, AMC.

Publication of QDRIs will be made generally applicable to all AMC subordinate commands and laboratory installations. Included in the QDRI publications will be classified problems of the Problems Guide type, expanded to give added information.

The QDRI pamphlets to be published by AMC's commands and installations will be designed for indefinite use and be amended as necessary by change sheets. In this way, more current information can be maintained more economically.

Similarly the Army Unfunded Study Program, formerly carried on by the Technical Services with OCRD direction and control, is to be continued by the AMC R&D Directorate under Lt Col Trussell of the Technical Industrial Liaison Office.

Contract Specialist Assigned to Army Research Staff

Robert A. Fink is a newcomer to the U.S. Army Research Office staff as a contract specialist in the Contracts and Grants Branch, Research Programs Office.

As a contracting officer with the U.S. Army Signal Corps since 1961 and earlier a contract administrator with Space Avionics, Inc., he brings many years of professional experience to his new duties.

During World War II he served in the Army Air Corps, supervising assembly, maintenance and testing of bomber and fighter aircraft. Until 1950 he worked as an aircraft maintenance supervisor at Wright-Patterson Air Force Base, Ohio.

From 1955 to 1960 he was a supervisor and then a division chief with the U.S. Air Force, Atlanta Air Procurement District, Atlanta, Ga.

Robert A. Fink

Maj Gen Lampert Heads USMA; Gen Howze Leads 8th Army

Maj Gen James B. Lampert, Director of Military Construction, U.S. Army Corps of Engineers, succeeded Maj Gen William C. Westmoreland as Superintendent of the U.S. Military Academy June 27.

When the time for the 1964 Bienniel Army Science Conference rolls around next June, General Lampert as host will have the opportunity to welcome many of his friends and associates in Army research and development. From November 1952 to July 1957 he was Special Assistant for Nuclear Power to the Assistant Chief of Engineers. During that time he served also as Chief of the Army Reactor Board with the Atomic Energy Commission.

General Westmoreland is assigned to command the XVIII Airborne Corps at Fort Bragg, N.C., and is soon to be advanced to 3-star rank. His predecessor, Lt Gen Hamilton H. Howze, is slated to gain 4-star rank when he goes to Korea to command the Eighth U.S. Army and serve also as United Nations Commander in Chief in Korea, effective upon the retirement of General Guy S. Meloy.

Watertown Arsenal Develops Rules for Successful Titanium Joint Welding

Rules applicable to successful welding of titanium joints in fabrication of reactive metal alloys have been developed through research at Watertown Arsenal, home of the U.S. Army Materials Research Agency.

Investigations were conducted to cope with problems the manufacturer of metal components is encountering in handling reactive metals for both commercial and military applications. A solution to major difficulties was found in the fabrication of two titanium tank cupolas.

The alloy selected for the cupola fabrication was 4A1-4V, welded with commercially pure titanium wire (55A), and stress relieved at 600° F. for six hours. Test plates, welded in this manner, satisfactorily passed all ballistic performance requirements.

Contamination is a principal problem with titanium at elevated temperatures in both the liquid and solid state. Since three of the four dangerous interstitial elements ordinarily are present in air, the near perfect exclusion of the atmosphere is essential to the deposition of ductile arc welds in titanium.

In view of the necessity of a single pass, full penetration welds in materials up to one-half inch thick, involving large heat input, pose severe contamination problems.

Because of the major problems in design of satisfactory shields for atmospheric welding, and the fact that welds were not machined, Army Materials Research Agency scientists resorted to use of inert gas-enclosed chambers.

Maj William J. Ely, Deputy Commanding General, U.S. Army Materiel Command, and Col Robert B. Braind, Commanding Officer of the Army Materials Research Agency, visit an AMRA exhibit during Northeast States Commerce and Industry Exposition at Commonwealth Armory.

Inert gas chamber welding puts a premium on welder skill because of difficult manipulatory conditions. Watertown Arsenal found that training welders to meet the high standards necessary is not insurmountable, and that job shop production of heavy titanium fabrications can be achieved.

Rules applicable to welding of titanium joints up to one-half inch are listed as:

- Inert gas shielding without the use of a chamber is adequate only if the welds are machined.
- Even with inert atmosphere chambers, care must be taken to insure that the atmosphere is free of oxygen, nitrogen and hydrogen. Visual inspection of a test weld is the best way to check atmosphere cleanliness.
- Because of difficulties with crater cracking and control of penetration, run-out and run-on tabs should be used whenever possible.
- Inert gas welding guns should be modified to insure maximum visibility.
- Copper back-up plantes should be used with full penetration welds.
- Welding passes should never run over tack welds.

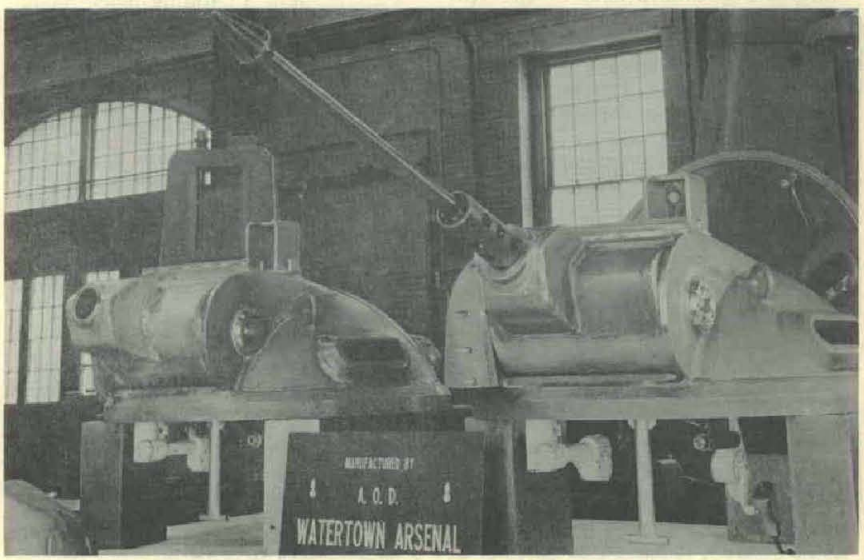
Intermediate inert gas-enclosed chamber used in gas metal-arc welding at Watertown (Mass.) Arsenal.

Redstone Microfilms, Indexes 100,000 Missile Part Drawings

More than 100,000 missile-part drawings are being microfilmed and indexed by the U.S. Army Missile Command, Redstone Arsenal, Ala., in line with an expanded effort to disseminate useful scientific and technical information.

Behind the missile-part microfilming is accumulating evidence in Army Missile Command documents that an increasing number of nonstandard and sole-source items are being specified by engineers when existing items could be used in their designs.

The Command's new product index system enables rapid location of all drawings of missile parts with similar characteristics. Use of a high-speed viewer identifies applicable drawings for rapid duplication and dissemination.



Titanium alloy tank cupolas welded at the Arsenal with commercially pure titanium wire (55A) with stress relieved at 600° F. for six hours.

Frankford Arsenal Develops Mobile Microwave Calibration Facility

By Elmer Rufe, Operations Division
Army Metrology-Calibration Center

Considerable advancement in the state-of-the-art of microwave measurements for field army use is incorporated in a newly developed mobile calibration facility.

Developed by the U.S. Army Meteorology and Calibration Center, Frankford Arsenal, Philadelphia, Pa., the unit is being used by calibration field teams. Benefits to the field army include greater reliability in guided missile firing, reduction in field calibration time, and possible reduction in the cost of future microwave calibration standards because of multi-purpose equipment design.

Mobility for the microwave facility is provided by an M292 expandable van equipped with hydraulic tail gate for equipment handling, and air conditioning for environmental control.

Precise microwave measurements until recently could be assured only in a fixed calibration laboratory. Measurements at tactical radar or guided missile field sites were made with equipment developed to meet individual testing and measurement requirements. Many different types of equipment were adopted to measure essentially the same basic parameter.

Recent advances in development of test equipment embrace multi-purpose measurement consoles and checkout systems with universal application. The Frankford design employs these.

To assure accuracy of equipment measurement, a program of certification, tracing calibrations to the National Bureau of Standards, is required. Within the Army, this program is directed by the U.S. Army Munitions Command through the Frankford Arsenal Metrology and Calibration Center.

One of the Center's responsibilities is to develop mobile field measurement capabilities supporting Army materiel. Accordingly, the mobile microwave calibration facility was developed for use in depots in the Continental United States and by Table of Organization and Equipment calibration companies overseas.

Specifications for the facility called for measurements over a range from 300 to 40,000 megacycles in the parameters of frequency, power, attenuation and standing wave radio, with accuracies at laboratory level.

Additionally, it had to be capable of providing on-site calibration service to the field army, such as a tactical guided missile unit location, with a minimum of standards and the shortest possible equipment setup time.

M292 calibration van shown with hydraulic tail gate down for equipment handling, and mounted air conditioning unit for environmental control.

Microwave calibration test set mounted in Army's mobile expanded van.

Adoption of a building-block-module concept enables future additions in all measurement parameters by adding a minimum number of new standards without discarding old, reliable ones.

Other module advantages include:

- Ready removal from the facility of any portion of the total measurement capability for use elsewhere as required.
- Maximum use of prepackaged equipment for multi-parameter application within their respective frequency ranges.
- Each module is individually shock mounted for greater protection during transportation.
- Measurement techniques are practical and can be efficiently utilized by personnel with a minimum of training.
- A microwave calibration test set has been developed with a truly multi-purpose application.

Laboratory testing of the standards and equipment of the facility was reported entirely satisfactory. The mobile facility has been used to provide calibration support in the European, Pacific and Caribbean Theaters on a field test basis. Conditions under which calibration support was provided varied from the best to the worst that any calibration team would encounter.

Transportation of the equipment and standards was by oversea air flights, motor truck and helicopter. Although some mechanical problems were noted and subsequently corrected, there were no electronic problems, and the test was successful.

Dr. Robert Buchheim Named Air Force Chief Scientist

Dr. Robert W. Buchheim, Head of the Aero-Astronautics Department, Rand Corp., Santa Monica, Calif., was recently appointed to a one-year term as Chief Scientist of the U.S. Air Force, effective in July.

Dr. Launor F. Carter, the incumbent, is returning to the System Development Corp. where he previously served as vice president and director of research.

Dr. Buchheim will be responsible for providing technical and scientific advice to the Chief of Staff of the Air Force on plans, programs and requirements. Closely associated with past Air Force programs in missile, aircraft and space systems, he has been a consultant to the Air Force Scientific Advisory Board.

With the Rand Corp. he has been directing programs aimed at solving a wide variety of aerospace problems, and has participated in planning for space flight, including lunar and interplanetary vehicles.

QM Scientists Develops Nomograph to Gauge Weather

A more knowledgeable approach to the problem of coping with the weather as it affects the comfort and activities of the soldier, and the performance of the equipment he uses, is due to a Quartermaster scientist.

In most areas of military operations records of temperature are maintained on a daily average and extreme basis, but detailed records of hourly temperatures often are not easily available.

Dr. Earl E. Lackey of the Earth Sciences Division, Quartermaster Research and Engineering Command, Natick, Mass., has found it possible to construct a nomograph by means of which he can predict, with considable confidence, the percentage frequency of hourly temperature at any place for which average and extreme temperatures are known.

For example, if the average daily temperature for January at Wichita, Kans., according to a 10-year record is 30.2° F., and the extreme maximum and minimum are 69° F. and —8° F., respectively, then by use of the nomograph it is safe to say that 1 percent of the time one may expect 1° F. or lower; 10 percent of the time, 12° F. or lower; 40 percent of the time, 24° F. or lower; 80 percent of the time, 42° F. or lower; and 99 percent of the time, 60° F. or lower. Of course, one could reverse the percentage scale and say 99 percent of the time above 1° F., and 1 percent of the time above 60° F.

The calculations may be done manually or by computing machines. With the work completed and tabulated for a network of weather stations, it is easily possible to construct probability maps of an area showing the percentage of the time the hourly temperature is likely to fall below, above, or between designated temperature limits.

A corresponding procedure is being used in predicting daily maximum and minimum temperatures and in assessing the probabilities of excessive rainfall. Quartermaster Corps scientists believe the nomographic method may have other possibilities.

Test By Fire

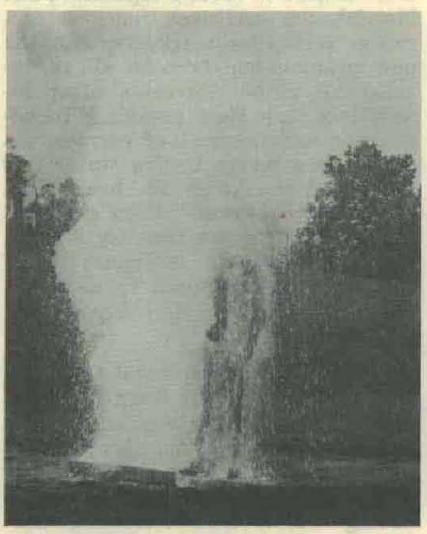
Experimental uniforms are undergoing tests at the U.S. Army Quartermaster Research and Engineering Command Laboratories, Natick, Mass., to determine their effectiveness against burning.

The results of testing are shown in the photo sequence, where the uniform on the manikin with head held high was treated with an experimental flame-resistant preparation; the other is untreated.

Experiments of this nature are a continuing project at Natick to insure safety and well-being of the American soldier to the maximum degree.

Quartermaster R&E Command technologist examines manikin wearing uniform treated with experimental flame-resistant preparation for test.

Powdered-magnesium fire ignited both uniforms to evaluate protection of the garments. Manikin wearing the treated uniform is now on the right.



In short order, both manikins are enrobed in sparks, smoke and fire.

Untreated uniform blazes profusely as treated one smolders slightly.

The untreated uniform is destroyed as treated uniform resists damage.

Watertown Arsenal Develops Uranium Alloys for Weaponry Material Needs

By F. J. Rizitano, J. Greenspan

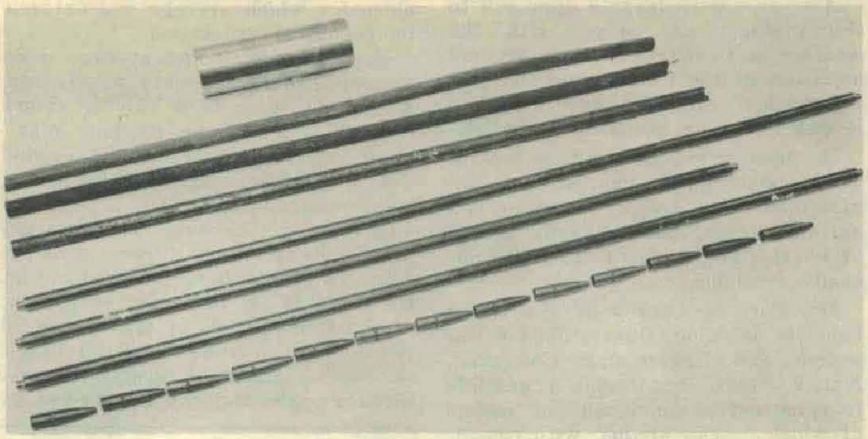
Stripped of the devastating power of U-234 fissionable isotopes, uranium is being employed by the U.S. Army in development of structural engineering material having high strength, density and ductility and hardness.

Mounting Army requirements for material possessing those characteristics, coupled with U.S. Atomic Energy Commission stockpiles of uranium depleted of its power of isotope detonation, led to special alloy research at the Army's Watertown Arsenal, Watertown, Mass.

Results of investigations to date, directed toward materials needed for weapons components, have proved fruitful. A number of good uranium alloys have been developed that satisfy established criteria, including reasonable ductility and hardness.

Uranium alloys meet the high-density and strength characteristics of scarce tungsten metal at lower cost, without the brittleness problems associated with tungsten and its alloys. Among other advantages are great ductility and toughness, melting and alloying by conventional vacuum melting techniques, and amenability to hot-working by conventional means.

In general, the uranium alloys are more versatile than tungsten alloys with respect to metallurgical engineering and processing operations. Uranium does have one disadvantage in that it is mildly radioactive. Special exhaust systems, properly filtered, are needed to avoid fine airborne particles being inhaled by the operators.



Uranium alloy bar stock XM-101
Billet, extruded bar, rolled bar, finished pieces

The uranium content of most uranium alloys of interest to the Army has been of the order of 90 to 95 percent by weight. In most experimental alloys, additions have consisted of various combination of molybdenum, titanium, columbium, aluminum, vanadium, zirconium and tantalum. Densities are of the order of 17 to 18 grams per cubic centimeter (g/cc) or 0.61 to 0.65 pounds per cubic inch (lb/in.^{3}).

The alloys most extensively employed for high-density components for Army weapons have been those of the uranium-molybdenum series having a density of approximately 17.3 g/cc. This group of alloys generally has the gamma-phase structure, being body centered cubic. However, several alloys in the experimental stage, that have the alpha-phase structure, orthorhombic, have exhibited superior mechanical properties (see Table 1).

Strengths in excess of 300,000 p.s.i., the highest known to date for uranium alloys, have been exhibited by some alloys to the latter group. Most engineering applications of interest to the Army, however, require a reasonably high level of impact resistance, which can be attained only at some sacrifice of strength.

Acceptable combinations of impact resistance and tensile strength have been attained in several experimental alloys by adjustment of alloy content and by appropriate thermal treatment. Typical mechanical properties are given in Table 1, where those of the new experimental alloys can be compared to those now in use.

One important consideration for uranium alloys to be employed by the Army is resistance to corrosion. Unalloyed uranium corrodes visibly after a short time in room temperature air. Molybdenum additions improve corrosion resistance markedly, and the new uranium-molybdenum alloys develop no visible corrosion after indefinitely long time periods. To accelerate measurement of corrosion, a much more severe boiling water test is employed. After 24 hours, the uranium-molybdenum alloys exhibit a weight loss of approximately 3 milligrams per square decimeter (mg/dm^2/day), as compared to a weight change of 7,000 mg/dm^2/day for unalloyed uranium.

Some of the experimental alloys exhibit a weight loss of 6 mg/dm^2/day, which is considered very good. The estimated military specification for corrision resistance (WA-PD-373, Aug. 21, 1962) is 20 mg/dm^2/day in boiling water, thus indicating adequate corrosion resistance for the experimental alloys.

Table 1.—Typical mechanical properties for some uranium alloys

Property	Alloy identifications			
	A[1]	B[2]	C[3]	D[4]
Impact resistance, ft.-lbs. Charpy at —40° F.	3.4	8.4	8.1	3.4
Yield strength, p.s.i. .1 percent offset	131,000	50,000	154,000	264,000
Ultimate strength, p.s.i.	134,000	180,000	204,000	312,000
Elongation, percent	13	10	4	3
Reduction in area, percent	28	23	7	7
Hardness, Rockwell C	42	34	43	57

[1] Body centered cubic alloy now in use, as extruded.
[2] Experimental orthorhombic alloy, extruded and heat-treated.
[3] Experimental orthorhombic alloys, extruded and heat-treated.
[4] Experimental orthorhombic alloy, as extruded.

Medical R&D Lab at Fort Totten Develops New Field Equipment

The only Army agency designing prototypes of military medical field equipment, the U.S. Army Medical Equipment Research and Development Laboratory, Fort Totten, N.Y., is in its 41st year of serving American fighting men.

A Class II activity of the Army Surgeon General's Office, the Laboratory traces its history to the Mexican Border Campaign and World War I. Few items of equipment then met the needs of military medical practice.

Shortly after World War I the Army Surgeon directed a study regarding complaints of medical equipment which resulted in recommendations for corrective action. Most important was establishment of the U.S. Army Medical Equipment Laboratory at Carlisle Barracks, Pa., Sept. 10, 1921, with a mission to design and field test its own equipment and to furnish industry with tried and proved equipment designs.

After 40 years as developer of new medical military field items for the Armed Forces, including a move to its present location, full responsibility for the operation of the Laboratory was assigned to the Army on June 1, 1962 by the Secretary of Defense.

Col Raymond J. Karpen currently commands the Laboratory, consisting of an engineering, experimental shop, administrative and audiovisual divisions manned by 9 military and 35 civilian personnel.

Projects presently in various stages of design, study and testing at the Laboratory include operating tables, refrigerators, plastic surgical instruments, first aid kits, resuscitators and respirators.

After a prototype model is fabricated, it is tested under varying conditions of heat, cold, moisture, rough handling and adaptability. A contract is then let to determine whether design is favorable to manufacture in large quantities and also to obtain samples for field testing at medical installations worldwide.

U.S. Army Equipment R&D Laboratory (Fort Totten, N.Y.) patent winners include (left to right) Benjamin D. Pile, Abraham Hyman, Aaron Ismach.

Recent inventions at the Laboratory for which patents have been granted include a collapsible support structure, now in the field testing stage. Designed by Technical Director Benjamin D. Pile, the device supports folding beds, laboratory tables, operating room lamps and other items.

Holder of four other medical patents, Pile is an Army Reserve colonel whose name is listed in *Who's Who In Engineering*. His patents include two vitamin capsulating machines, a magnetic drive for mobile blood refrigerators and a folding leg splint for field use. He has also filed a patent application on a field sterilizer.

A rugged audiometer of simple design is another recent accomplishment at the Laboratory. Invented by Abraham Hyman, Chief, Electrical Engineering Branch, the new device can be serviced in the field by a potentiometer means for calibration.

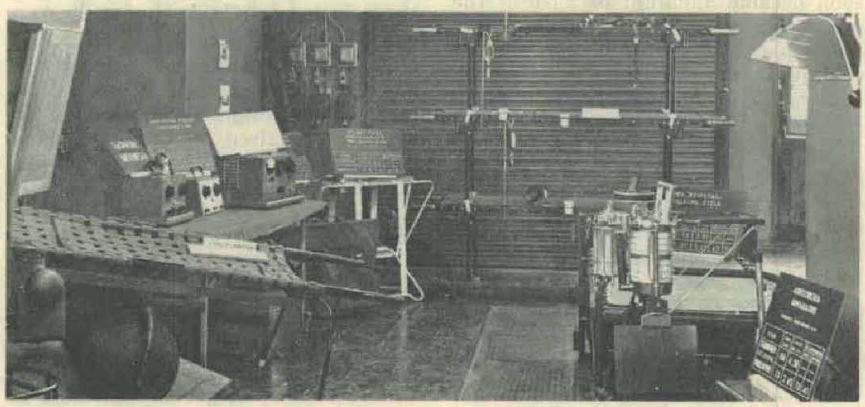
The calibration device, another of Hyman's inventions, is designed around a variable frequency oscillator capable of standardizing levels of sound intensity and frequency found in audiometers, and a crystal oscillator to insure precision self-tuning.

Three other patents granted to Hyman in the field of electronic circuitry include a method for obtaining the difference between the levels of two pulses, a method for converting a balanced circuit, and a basic electronic phase shifter for medical application. He also has patents pending on a diagnostic audiometer with additional features for more comprehensive audiological testing, two monitor lung devices, and an instrumentation system for medical application.

Aaron Ismach, Chief of the Mechanical Engineering Branch, invented the multi-dose jet injection apparatus. Known as the "gun," it is capable of inoculating more personnel in a shorter time with greater safety than was possible with the conventional hypodermic needles and syringes or other hypodermic injection devices. Only the vaccine enters the skin, requiring no sterilization between injections, and there is no risk of cross infection.

Ismach has patents pending on a new adaptation of the jet injection gun with a special nozzle for intradermal injections, such as in smallpox vaccination or in tuberculosis testing, and an automatic resuscitator suitable for emergency field use as a controller with an anesthesia machine.

Reflecting the creative ability of the dedicated scientists of the U.S. Army Medical Equipment Research and Devolpment Laboratory, these inventions are helping to provide the American soldier with the best medical equipment where and whenever he needs it.



Medical field equipment on display at Fort Totten Equipment R&D Laboratory includes cargo carrier, audiometers and calibrators, surgical basins, litter and folding beds, anesthesia apparatus and surgical lights.

USAERDL Fuels Decontamination Program

By Leroy L. Stark
USAERDL, Fort Belvoir, Va.

Current aviation technology and recent advances in turbine and jet powered aircraft have vastly increased the importance of providing military aircraft with fuel that is free from sediment and water.

Investigation has established that crashes in which expensive aircraft and highly trained crews were lost, and numerous instances of engine and fuel control malfunctions, were directly traceable to contaminated fuel.

In an effort to meet requirements of aircraft equipped with engines and fuel controls with a low tolerance for contamination, standards for fuel performance were first prepared by a joint military-industry group.

As new aircraft power plants came into use, requirements were progressively made more stringent, up to the present time when they are reflected in Specification MIL-F-8901.

Fuel decontamination equipment used in military fueling systems, as stipulated in this specification, must be capable of delivering fuel containing not more than 0.7 milligrams per liter of solids, and not more than 2.5 milligrams of undissolved water.

The U.S. Army Mobility Command Engineer Research and Development Laboratories (USAERDL), Fort Belvoir, Va., became involved about 15 years ago in decontaminating fuel used in military aircraft through the Corps of Engineer's responsibility for design and construction of air bases for the U.S. Air Force.

Technician adjusts 300 g.p.m. military design filter/separator. Specifications of the unit meet requirements of MIL-F-8901 for removal of contamination from the fuel.

Technicians refuel helicopter with hand-operated pump equipped with 15 g.p.m. filter/separator at Davison Army Air Field, Fort Belvoir, Va.

Thousands of fuel decontaminating filters and separators then were required and, since no military design equipment was available, commercial equipment was procured on a performance basis, with design, size, configuration and materials at the option of the manufacturer.

Laboratory facilities required for effective evaluation of the performance of fuel decontamination equipment were then constructed at USAERDL. After an evaluation and modification program, several qualified suppliers were approved. The necessary filters and separators then were procured and installed in the air base fueling systems.

This equipment satisfied the immediate needs in providing fuel that met cleanliness standards of the time, reduced the number of plane crashes traceable to contaminated fuel, and minimized fuel control and engine maintenance.

A field parts replacement problem soon became apparent because of the use of many commercial model filters and separators whose dimensions and configurations varied. Consequently, replaceable components were not interchangeable.

Action on development of standard design filters and separators, however, was not initiated because of the instability of decontamination requirements brought about by rapid changes such as:

- Advent of JP-4 in lieu of gasoline as the primary aircraft fuel.
- Increased use of additives in the fuel.
- More rigorous fuel cleanliness requirements.
- Use of combination filter/separators in lieu of individual filters and separators.
- Development of conversion kits for use in installed vessels containing obsolete water/solids removal media.

Each change of this nature had the effect of obsoleting existing equipment, making it necessary to undertake further development and evaluation. Additional makes and models were added to the assortment in the field, which further complicated the parts replacement problems.

Early in 1958, at a time when fuel cleanliness and decontamination equipment requirements appeared to be temporarily stabilized, USAERDL initiated development of a basic family of military design filter/separators for Army use.

Standard dimensions were selected for the filter/coalescer elements, 3¾ inches in diameter and 20 inches long. They would be used interchangeably in multiples for filter/separators of any desired capacity. Three capacities selected for the basic family were 50, 300 and 600 g.p.m.

USAERDL engineers realized that filter/separator vessels of other capacities and configurations would eventually be required for the many fixed, portable and mobile applications expected to develop when the concept of a military standard dimension filter/coalescer element was proved feasible.

Considerable difficulty was encountered in attempts to develop filter/coalescer elements capable of meeting the rigorous performance requirements of MIL-F-8901, within the limits of the selected dimensions, until five acceptable element sources were finally qualified.

The military design filter/separa-

tors are adaptable to the following currently known applications:

- 50 g.p.m.—Fueling system on 1,200 gallon tank trucks, fueling kit for converting cargo truck to tank truck, and fueling system on Rolling Liquid Transporter.
- 300 g.p.m.—Fueling system on 5,000 gallon tank trucks, fueling system on special aircraft fueling vehicles, installed fueling systems for fighter and heavy aircraft, overland hoseline bulk fuel system, and Class III Supply Point fuel dispensing system.
- 600 g.p.m. — Overland pipeline bulk fuel system, installed fueling system for fighter and heavy aircraft, and carrier-based fueling system for aircraft.

Military design filter/separators, regardless of their logistical, operational and maintenance advantages over currently used nonstandard commercial equipment, cannot be expected to replace in the near future the thousands already in the field. Such a complete changeover is not economically feasible. Replacement procedure must be gradually accomplished over a period of several years as procurement funds permit.

Most new procurements are being confined to the new military design. In some cases, it is possible to minimize replacement costs by continuing use of the original nonstandard vessel, with the internal components replaced by special conversion hardware. This hardware utilizes the standard dimension filter/coalescer elements which upgrades performance to meet current fuel cleanliness requirements.

Subsequent to initiating development of the above filter/separators, a 15 g.p.m. unit was developed for use with a hand-operated pump to meet a requirement for fueling light liaison planes and helicopters from 55-gallon fuel drums. This unit uses a single element of the same interchangeable type in the larger units.

In mid-1962 the Army shipped 33 of these units to U.S. military forces in Vietnam to support fueling of Army aircraft. A report received in March 1963 from Headquarters, U.S. Support Group, Vietnam, stated that filter/separators in fueling service at nine field sites have proved to be most efficient and required little upkeep.

Recognition for pioneering research and 15 years of responsibility for selection and preproduction evaluation of fuels decontamination equipment for the Armed Forces and the Federal Aviation Agency came when USAERDL was officially designated as the central laboratory for all Department of Defense evaluations on Feb. 1, 1963.

Military standard dimension filter/coalescer element, 3¾ inches outside diameter by 20 inches length, is used interchangeably in multiples for filter/coalescer separators of any desired capacity. Canister (above) contains a plastic-coated, 100-mesh screen that performs a second-stage, water-stripping job after coalescence.

Fuel decontamination requirements, based on trends in recent years, probably will continue to become more rigorous. New fuels undoubtedly will obsolete current decontamination equipment and necessitate further advancement in the state-of-the-art. Fuel cleanliness standards will be made more stringent as refined aircraft power plants are developed. Requirements already are being imposed for extremely small and lightweight filter/separators for installation in mobile equipment.

USAERDL has been preparing for these future requirements by a program of in-house and contract research, one phase of which seeks methods for improving performance of available filter/coalescer elements.

Progress to date indicates that the flow rate per 3¾" x 20" standard element can be upgraded from the current rate of 10 g.p.m. in the 300 and 600 g.p.m. filter/separator, to 20 g.p.m. Flow increase will reduce the number of elements by half and result in a very significant reduction in filter/separator size, weight and cost. It is planned to start design of the reduced size filter/separators in fiscal year 1964.

Continuing studies are being made into the physical phenomena involved in filtering and coalescence, and into materials available for these functions, with the objective of possible improved element design. Thinking is also being directed toward development of a completely military design filter/coalescer element.

Currently, dimensions and performance are specified, but selection of materials and method of fabrication are the manufacturer's option. This situation results in production control problems which might be eliminated if all details of element construction were standardized.

Another research project of interest is Project BEARS, Bacteriological Effects, Airfield Refueling Systems. USAERDL devised and initiated this work at the request of the Air Force in January 1962, after indications that microbial contamination of aircraft fuels was an increasing problem.

BEARS was set up as a tri-service project, since all services had a direct interest in solving the problem. Investigations are being conducted at Kindley Air Force Base, Bermuda, with the objective of:

- Obtaining information on rate of microbial growth in a typical airfield fueling system.
- Studying how this contamination affects performance of filter/separators and other fueling components.
- Determining methods and materials for eliminating or reducing microbial growths.

USAERDL furnishes a 7-man technical team on a periodic visit basis to coordinate and perform the necessary investigations, and to evaluate and report the results.

Future developments may be expected to increase the importance of fuel decontamination procedures. USAERDL is prepared to solve or assist in solving contamination problems as they arise, and in accomplishment of the overall Department of Defense fuel handling equipment development program.

Army Assists Cornell Lab At 'Copter' V/STOL Parley

"Dynamic Loads, helicopters and V/STOL Aircraft" is the subject of a symposium to be sponsored by the U.S. Army and the Cornell Aeronautical Laboratory in Buffalo, N.Y., June 26-28.

Sixteen presentations on helicopter and V/STOL research efforts and accomplishments are scheduled. Independent research, Government-sponsored research and research carried on by Government agencies, the National Aeronautics and Space Agency and the U.S. Army Transportation Research Command will be discussed.

Five helicopter and five V/STOL companies will make presentations on existing and future R&D problems in a panel meeting.

Defense Officials Observe Army R&D Activities in Panama

Projected growth of activities of the U.S. Army Research and Development Office, Panama, occasioned a visit of Defense officials May 27-29.

Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen headed a 10-man group that included representatives of the Office of the Director of Defense Research and Engineering, the Air Force, Navy, Marine Corps and ARPA.

Dignitaries included: Dr. John L. McLucas, Deputy Director (Tactical Warfare Programs), Director of Ordnance Melvin Bell and Brig Gen W. W. Beverley, all of ODDRE; Brig Gen B. A. Hochmuth, Deputy Chief of Staff for R&D, Marine Corps; Col J. M. Callendar and Col J. T. Stewart, representing respectively the Navy and the Air Force Secretaries;

Deputy Director (Management) William H. Godel, ARPA; Brig Gen Lawrence E. Schlanser, Deputy Commanding General of the U.S. Army Test and Evaluation Command; and Col K. C. Emerson, Assistant for Research on Dr. Larsen's staff.

Col Robert T. Larson, commander of the Panama office, outlined its background, mission, organization, current capabilities to support test and research projects, projected programs, and problem areas.

The briefing included plans for establishing a science information center for the tropics, selection and development of a spectrum of research and test sites, and the organization and operation of an environmental observational network.

Chief Scientist Dr. Leo Alpert discussed Canal Zone environmental conditions and compared them with conditions in Southeast Asia as being analogous to an unusual degree.

Col Robert T. Larson (left), Commanding Officer, U.S. Army R&D Office, Panama, chats with Dr. Finn J. Larsen, Assistant Secretary of the Army, R&D, en route to the jungle research and test site at Fort Sherman.

Technical Adviser and Chief Engineer Frank Mendez reported that 15 test and research projects were completed in 1962 and discussed a number of projects programed for calendar year 1963.

During the 3-day visit the group received briefings at the Jungle Warfare Training Center, the Naval Corrosion Laboratory, the Gorgas Memorial Laboratory, and the Middle America Research Unit.

Panama R&D Office Plans Brochure, Invites Requests

The U.S. Army Research and Development Office, Panama, is preparing a brochure which should come off the press about Sept. 1, 1963. Information will include:

- Research and test services and facilities available both in the Canal Zone and the Republic of Panama.
- Geography of the Canal Zone and the Republic of Panama.
- Potential for conducting research and tests in various subject fields.
- Research and test sites in use, being developed, and contemplated.
- Procedures for initiating a research or test project in the Canal Zone, the Republic of Panama, and elsewhere in Latin America.
- Shipment of research and test equipment to Panama.

Any organization desiring to be on the initial distribution list should notify the Commanding Officer, U.S. Army Research and Development Office, Panama, P.O. Drawer 942, Fort Clayton, Canal Zone.

R&D LEADERS observe specimens mounted on panels for research on deterioration at the Fort Sherman jungle exposure site. Left to right are Dr. John L. McLucas, Deputy Director, Tactical Warfare Program, ODDRE, OSD; Frank Brannan, engineer, Army R&D Office, Panama; and Dr. Finn J. Larsen, Assistant Secretary of the Army for Research and Development.

Project HARP Sets Records For High Altitude Research

Project HARP (High Altitude Research Program,) a McGill University of Canana activity employing 140-ton, 16-inch naval guns provided through U.S. Army logistic and funding support, set successive world records June 16 and 19.

McGill's Dean of Engineering, Prof. D. L. Mordell, announced that the June 16 firing of a Martlett II projectile, weighing about 375 pounds, attained an altitude of 300,000 feet—nearly 57 miles. That was a record for gun-fired probes.

Two days later, on June 19, a similare projectile reached a height of 335,000 feet. The gun-tube launcher is located on a high plateau on the Island of Barbados, W.I.F. (For details of Project HARP, see issues of August 1962 and March 1963.)