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Army Invites 500 Leaders to Biennial Science Conference

High-level officials of all Federal Government defense and scientific agencies have been invited to join nearly 500 selected participants in the third biennial Army Science Conference, June 20-22, at the United States Military Academy, West Point, N.Y.

President Kennedy's Special Assistant for Science and Technology, Dr. Jerome B. Wiesner, a former member of the Army Scientific Advisory Panel, and Secretary of the Army Elvis J. Stahr, jr., are among dignitaries expected to attend or be represented by key staff members.

Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen is on the agenda as principal speaker at the conference banquet, June 21. Lt Gen Arthur G. Trudeau, Chief of Research and Development, and Maj Gen W. C. Westmoreland, Superintendent of the U.S. Military Academy, are programed as speakers at the opening session.

Leading scientists, engineers and administrators of the Army's seven Technical services, Army General Staff, Army Security Agency, U.S. Continental Army Command, Special Operations Research Office of the American University, Human Resources Research Office of George Washington University, Army Mathematics Research Center at the University of Wisconsin, Army Personnel

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Maj Gen Frank S. Besson, Jr.

Lt Gen John P. Daley

Lt Gen J. H. Hinrichs

Army Gets OK to Create Limited War Laboratory

Changing emphasis in national military concepts, responsive to the increasing need of readiness for any type of confined combat in remote undeveloped areas, backs a decision to expedite establishment of a U.S. Army Limited War Laboratory.

The Department of the Army recently approved a USALWL proposal presented by the Chief of Research and Development, Lt Gen Arthur G. Trudeau. Action is being taken to assemble an initial cadre of military and civilian experts to develop remaining details of advanced planning and effect establishment of the laboratory.

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Kennedy Names Besson, Daley, Hinrichs Chiefs In R&D Reorganization

An effectively energetic exponent of advanced mobility concepts for the modern Army, Maj Gen Frank S. Besson, Jr., Chief of Transportation since March 1958, is President Kennedy's choice to head the powerful new Material Development and Logistic Command.

Designated at the same time the White House announced nomination of Lt Gen Barksdale Hamlett on Mar. 22 to succeed General Clyde D. Eddleman as Vice Chief of Staff, General Besson also was recommended for 3-star rank. General Eddleman retired effective Mar. 31 to end a distinguished military career that began as a U.S. Military Academy graduate in 1924.

President Kennedy also announced nomination of Lt Gen John P. Daley, Deputy Commanding General for Development, U.S. Continental Army Command, to take command of the new Combat Developments Command.

Chief of Ordnance Lt Gen John H.

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Featured In This Issue . . .

Army R&D Newsmagazine

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Views on Role of In-House Laboratories Outlined In Address to American Management Association

By Dr. Finn J. Larsen
Assistant Secretary of the Army (R&D)

(In a recent address to the American Management Association in Chicago, Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen discussed the various roles and responsibilities of Army in-house laboratories, as follows.)

. . . One of the major responsibilities of the Federal Government is to insure that the vast sums it spends on research and development are spent as fruitfully as possible. This means that due consideration must be given to work which can be performed in laboratories owned and operated by industry, universities, other private groups or individuals, and Government laboratories.

Improvement of our scientific and technological posture is vital to the future growth of America and the Free World. The task is so vast that there will always be a place for Government, industry, universities, foundations, and individuals in our program. I believe that each of these has a challenging and rewarding role, and that all of these components should actively participate and make their contribution to our national effort in research and development.

. . . Private institutions, especially universities, should not be diverted from their primary functions so essential to a continuation of our culture and way of life. Therefore, the Army, in most cases, obtains assistance from universities and similar institutions through the use of small project grants or contracts to support the work of outstanding scientists in certain disciplines. This type of support also helps train graduate students who otherwise might graduate with less research training.

Industry and the rest of our Nation profit through this portion of the Army program because most of the work is in basic research and, therefore, results in benefits to many segments of our economy. In my opinion, we must continue to support research in our universities, but in the years ahead it is recognized that their capabilities will not increase significantly.

In 1958, the President's Science Advisory Committee reported, "In the aircraft industry, over 85 percent of all research and development is financed by the Government. In the electrical equipment industry, the Government share is over 60 percent; in telecommunications and broadcasting, over 40 percent; in scientific instruments, over 35 percent.

"The eight Government agencies that spend over 95 percent of all Federal research and development funds estimated that the fraction of these funds spent outside the Government would rise from 59 percent in 1958 to 66 percent in 1962." With the continued needs in Defense, and an increased budget for the National Aeronautics and Space Administration, that has been exceeded.

This year the Army laboratories performed 28 percent of the Army RDT&E work; 72 percent was spent on grants or contracts with non-Army agencies. . . . As the Army RDT&E budget has increased, a larger percentage has been expanded with non-Army agencies. This trend should continue somewhat in proportion to increases in budgets authorized by the Congress. . . .

Army laboratories are vital assets to our national research and development program, and will continue to fulfill a unique role in the Army structure. This role is often overlooked, or misunderstood, even by managers in industry. . . .

While there are many functions of Army laboratories, I will discuss seven that I consider most significant:

• Today the solution to most problems in defense involves a complex mixture of the scientific disciplines and technology. Weapons systems, tactics, strategy and organization of forces in a rapidly changing world situation, daily present problems which require immediate solution. Policymakers in the Army must have available, on a daily and continuing basis, adequate technical and scientific information and data for sound decisions. Due to the variety of information needed, and the urgency of requirements when needed, we must have technical advice on a continuing basis which can only be provided economically by our in-house laboratories.

• The scientific and technological competence of our in-house laboratories is valuable in assisting with the selection of RDT&E contractors. I know of no other group that can perform this service as well, or with as little prejudice. As you know, the Congress has become increasingly concerned with the problem of "conflict of interests" in Government spending. *Therefore, I think you will agree that to obtain the same competence and objectivity from sources outside of Government would be difficult and more expensive. Even*

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APG Ballistic Research Labs Design, Build Advanced Computer

Rarely has there been more soundly based justification for leaning on the trite quotation that "Great oaks from little acorns grow" than the occasion of the Mar. 20 dedication of the U.S. Army Ballistic Research Laboratory Electronic Scientific Computer.

When newsmen assembled at Aberdeen Proving Ground, Md., for a press tour unveiling of BRLESC—which features what BRL scientists believe is the fastest large-scale memory (storage) unit in operation today—the dedicatory ceremony might have impressed some as less ostentatious than warranted to mark a momentous milestone in computer development.

In a way, perhaps, the occasion was as lacking in immediate impact on significance sensitivities of some observers as was the first public showing of ENIAC in 1945. Still ENIAC, the U.S. Army's first computer, provided the initial impetus for development of the Nation's current multi-billion-dollar computer and automatic data processing industry.

ENIAC appears on its way to the Smithsonian Institution, or another leading museum, as posterity's evidence of what started the microsecond transmission of information that otherwise might take the world's best mathematicians days, weeks, months or even years to determine. ENIAC, in the annals of evolution that have made American industry what it is today, seems to merit a spot alongside the Wright Brother's first airplane.

Dr. John G. Brainerd, University of Pennsylvania scientist who helped to develop the first version of ENIAC, spoke briefly at the dedicatory ceremony Mar. 20. Brig Gen Chester W. Clark, Chief of the Research and Development Division, Office of the Chief of Ordnance, and OCO Chief Scientist Dr. George H. Lee were present, as were a number of officials and scientists of other Army installations.

Mrs. Ermalee H. McCauley of the Computing Laboratory, BRL, observes operation of high-speed printer of BRLESC at Aberdeen Proving Ground.

John G. Gregory, engineer in charge of the computer development at BRL, examines the 4,096-word, high-speed magnetic core storage (memory) unit.

Brig Gen Leslie E. Simon (U.S. Army, Ret.) spoke on some of the research problems of the ENIAC project. He was Director of the Ordnance Ballistic Research Laboratories at the time ENIAC was under development and later became Assistant Chief of Ordnance for R&D.

Remarks also were made by Col Paul N. Gillon (U.S. Army, Ret.), who was a captain at the BRL when he worked on ENIAC, and Dr. Herman H. Goldstine, who worked with him as a lieutenant reserve officer. Dr. Goldstine is now a computer expert at the International Business Machines Research Center, a permanent member of the Institute for Advanced Study at Princeton, and an authority in the field of numerical analysis.

Most of the information newsmen gleaned about BRLESC and its Army computer forebears, EDVAC and ORDVAC following upon ENIAC which, in turn, spawned development by other agencies of ORAC, AVIDAC, ORACLE, JOHNNIAC, ILLIAC, SILLIAC, MANIAC, and CYCLONE, was contained in a press packet. One brochure advised them that:

"For a short period in 1952 the Ballistic Research Laboratories comprised the largest computing center in existence, with three large-scale high-speed electronic digital computers, all of which were devoted exclusively to defense problems."

As is increasingly true of Army research and development under a policy of cooperating with other major Government R&D agencies, and integrating effort wherever possible in the interest of economy and pooling of knowledge for expeditious advances, BRLESC is a product of joint effort.

Credit for a major assist in BRLESC development goes to the National Bureau of Standards. Ballistic Research Laboratories computer-scientists, based on their long experience with ENIAC, EDVAC and ORDVAC, designed BRLESC in conjunction with NBS computer experts. BRL technicians assembled it.

ENIAC and EDVAC, the latter installed in 1949, were designed by University of Pennsylvania scientists sponsored by the Army under contract. Likewise, ORDVAC was installed at BRL in 1952 under contract with the University of Illinois.

Views on Role of In-House Laboratories Outlined

(Continued from page 2)

though it could be done by non-Government agencies, such groups are often subject to criticism from many sources. Therefore, we intend to continue to use our in-house laboratories, assisted by other sources when required, to aid in the selection of RDT&E contractors.

• Sometimes we find that it is in the best interests of the Army, for time, money or scientific competence, to use our in-house laboratories to perform parts of a task not assigned or assignable to a contractor. In the development of new weapons systems and materiel, it is not uncommon to find that the best competence is in our laboratories. This is normal for the research projects originated and conducted in these laboratories. As the development work is accomplished in industry, new capabilities are obtained by the contractor. But, in the beginning, the contractor may well need assistance from our in-house laboratories for new projects. This requirement seldom exists with product improvement projects.

• Any large, diversified and complex organization has a continuing requirement for a fire-brigade of problem-solvers. Advance planning uncovers many

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BRLESC, Amazing Descendant of ENIAC, Has Vital Role

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Computer progress and the rapidly expanding need of the Army for the most advanced models obtainable, largely as a result of problems of rocket, missile and satellite R&D advances, resulted in a BRL decision in 1957 to begin work on BRLESC. The reader may ask, since superior commercial computers then were available, why didn't the Army buy one?

Two obstacles barred such an outwardly simple solution. First, a commercial computer would have had to be modified to meet BRL's exacting requirements. Second, money available was insufficient to purchase a computer. Consequently, it was decided to combine the skills and talents of BRL researchers and technicians to design and assemble a computer, incorporating in the basic design an instruction code needed for Ordnance.

When it was learned that the National Bureau of Standards was developing a computer, parts of which could be standardized and used also for building a BRL computer, BRL funds were advanced to support some of the NBS development. The Army-NBS teamwork has made the Army proud of BRLESC.

Although the number of tubes, transistors and other parts in BRLESC are decreased compared with earlier models, it is composed of 6,120 vacuum tubes, 8,740 transistors, 126,300 diodes, and thousands of miles of wire. BRL scientists contend that, equipped to handle 19 decimal-digit numbers, it permits more precise or at least as precise computations as any computer in existence.

Another significant advance claimed for BRLESC is that its increased capability for logical instruction saves toil for the computer programer, reducing this operation to one-fourth of that previously required.

Whereas other computers, up to now, could handle a mathematical problem only if instructions were broken down into addition, subtraction, multiplication and division in each program, BRLESC is said to be capable of executing in one program 16 logical operations, by making 16 magnetic tape handlers directly accessible to the program.

The memory or "storage" unit in a computer logs fragments of problems and answers for reference in later steps of a problem. Millions of references may be used in solving a single problem, and BRLESC is credited with having the "fastest large-scale memory unit in operation today." Numbers can be recorded and read in 1.5 millionths of a second.

In conceding that STRETCH, developed by International Business Machines Corp., and LARC, a product of Universal Automatic Computer, subsidiary of Remington Rand Corp., achieve a greater memory speed by using extra units geared for simultaneous operation, a BRL brochure states:

". . . The BRLESC is approximately one-half as fast as the two fastest high performance computers yet constructed anywhere, and twice as fast as the most rapid computer currently available commercially." Actually, it was pointed out, BRLESC has roughly one-half the speed of LARC and one-third the speed of STRETCH.

One of the problems of integrating R&D of two or more governmental agencies toward a common objective is pointed up in the BRL-NBS teamwork on BRLESC. A total $275,000 of BRLESC's cost of $680,000 was allocated by the Army to the National Bureau of Standards for component packages during the developmental phase. Still about all that BRLESC and the NBS computer have in common is the logical package and aspects of the high-speed arithmetic unit.

Army development of the ENIAC computer grew out of the critical needs of solving logistic and other mathematical problems in World War I. The first contract in 1943 was let to the Moore School of Electrical Engineering at the University of Pennsylvania.

Similar problems incident to the broad reorganization of the Army now underway, and the development of weapons systems and defenses to insure military supremacy in the future, point up the great potential of BRLESC in Army short-and long-range planning. Regarding this potential, the brochure prepared to present the story of BRLESC to the public has this to say:

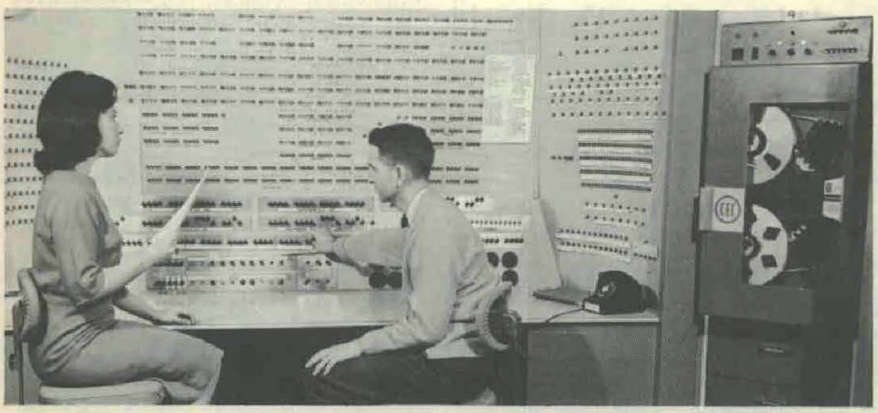
"What actually will BRLESC do for the Ordnance Corps and the scientific community? It will permit the solution of problems which could never be solved before, due to the excessive amount of time or space required; and it will provide a precision not usually possible without the great pain of multi-precision arithmetic.

"BRLESC will be used in the computation of firing tables and guidance control data for Ordnance weapons, including missiles. It will handle interior ballistic problems, for example, the behavior of projectile, propellant, and launcher stability and thermodynamic properties of rocket propellants; reflected shock waves; vibration of gun barrels; and flow of fluids through porous media.

"Terminal ballistics studies to be performed include nuclear, fragmentation and penetration effects, in such areas as explosion kinetics, shaped charge, ignition, and heat transfer.

"Ballistic measurement studies to be performed will include photogrammetry, ionospheric measurements, damping of satellite spin calculations, reduction of satellite doppler tracking data, and computation of satellite orbital elements.

"Other studies will comprise anti-aircraft and antimissile evaluation, war-gaming problems, linear programing for solution of Army logistical problems, probabilities of mine detonations, lethal and kill probabilities of mine detonations, and lethal area and kill probability studies of rockets and guided missiles."



Console of Army's Ballistic Research Laboratories Electronic Scientific Computer (BRLESC) at Aberdeen Proving Ground, Md., is demonstrated by Lloyd Campbell, Chief, Special Problems Section, who contributed to the logical design of the BRLESC computer, and Mrs. Gail I. Beck, mathematics technician.

Col Johnston Takes Over From Brig Gen Thames As U.S. Army ADVENT Management Agency Head

Col J. Wilson Johnston, Signal Corps, has assumed command of the U.S. Army ADVENT Management Agency, Fort Monmouth, N.J. He succeeds Brig Gen William M. Thames.

Commanding General of USAAMA since October 1960, General Thames will retire June 30. In the interim he is serving at Headquarters, Department of the Army.

Nominated for brigadier general, Col Johnston served until reassignment as Deputy Chief of the Research and Development Division, Office of the Chief Signal Officer.

Born in Spokane, Wash., he was appointed a second lieutenant in the U.S. Army Reserve in 1932 at Eugene, Ore. He received a B.S. degree in business administration at the University of Oregon. Called to active duty in 1941, a month before the attack on Pearl Harbor, he served with Ninth Corps Area Headquarters at the Presidio of San Francisco, and later was assigned to a G-2 censorship post in the Western Defense Command and Fourth Army.

Col Johnston then served in a series of security assignments, with the Department of the Army, the Signal Security Agency, and as Deputy Chief, Army Security Agency, Pacific.

In 1949 he attended the Advanced Officers' Course of the U.S. Army Signal School, and later attended the U.S. Army Command and General Staff College, Fort Leavenworth, Kans. Upon graduation he remained to serve on the Staff and Faculty. In 1954 he attended the Industrial College of the Armed Forces.

Following a tour of duty as Chief, Plans and Training Branch of the Signal Division, SHAPE, in Paris, he began his duties in the Research and Development Division of the Office of the Chief Signal Officer in 1958 as Chief, Plans and Programs Branch.

Col Joseph W. Johnston

Among Col Johnston's military decorations is the Legion of Merit.

Army Expediting Procedures for Establishment of Limited War Laboratory

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When fully staffed, the USALWL will be manned by approximately 70 highly trained officers, civilian scientists, technicians and clerical personnel. Its primary mission, briefly stated, will be to generate new materiel concepts and develop Army materiel having particular application to limited war in remote areas. It will "maintain a thorough understanding of use requirements and work in close coordination with appropriate agencies of the Army combat development system."

Listed as using agencies having a particular interest in the work of the USALWL are the Special Warfare Center, the Infantry School, the Airborne, Electronics and Special Warfare Board and XVIII Airborne Corps.

Selection of the laboratory site will be based on availability of laboratory, shop and experimental facilities, and proximity to using agencies. It is planned to establish the laboratory at an existing R&D facility.

Under the concept as approved, the laboratory will be assigned selected projects and tasks to meet requirements generated by the Combat Development System and by overseas Combat and Development Test Centers. Tasks will be based upon priorities and the urgency of requirements as stated by the Deputy Chief of Staff for Operations. It is envisioned that the work of the laboratory will be limited to relatively small and simple items which are needed quickly to enhance capabilities in the lower portion of the limited war field.

The USALWL also will have a responsibility to generate new ideas for materiel to meet general requirements and development objectives. Ideas will be reviewed by appropriate agencies for generation of formal requirements prior to development beyond rough prototype fabrication and feasibility testing.

When established the laboratory will report directly to the Chief of Research and Development. At the appropriate time after it becomes an operating activity, it is planned that the laboratory will be transferred to the appropriate major field commander under the Army reorganization.

AROD Slates Photochemical Processes Symposium

A Symposium on Reversible Photochemical Processes will be held in Durham, N.C., Apr. 16-18 sponsored by the Army Research Office, Durham.

Approximately 150 leading research scientists in this field, representing 10 countries, have accepted invitations. Forty-two papers will be presented.

Dr. Henry Eyring, Dean of the Graduate School, University of Utah, and President-Elect of the American Chemical Society, will serve as chairman of the opening session. Dr. Melvin Calvin, Nobel Laureate in Chemistry (1961), will be among those presenting papers.

Dr. Wallace R. Brode is scheduled to speak on "Colorful Americans" at the conference banquet. He is National President of Sigma Xi, immediate past-president of the Optical Society of America, former Science Adviser to the Secretary of State and former president, American Association for the Advancement of Science.

A memorial session will honor the late Dr. Yehuda Hirshberg, Weizmann Institute of Science, Rehovoth, Israel, a pioneer in the field covered by the Symposium, who died in 1960.

Photochemistry is the branch of chemistry that deals with the permanent chemical effects of the interaction of electromagnetic radiation and matter. When a molecule is subjected to light of a certain frequency that it absorbs, it is raised to an excited state. One form of sequel may be that almost immediately, or after losing or gaining a number of vibrational quanta by collision, it may return to the ground electronic state, with emission of light (fluorescence).

The Symposium committee consists of Dr. George M. Wyman, AROD, chairman, Dr. Marvin Silver, AROD, Dr. John H. Saylor, Duke University, and Mrs. Helen Hinton, AROD, secretary. The Advisory Committee includes Dr. Melvin Calvin, University of California, Dr. Henry Eyring, University of Utah, Dr. John H. Gould, National Bureau of Standards, Dr. Lawrence J. Heidt, Massachusetts Institute of Technology, Dr. Michael Kasha, The Florida State University, Dr. Gerald Oster, Polytechnic Institute of Brooklyn, and Dr. George Wald, Harvard University.

Army Surgeon Contradicts Tendon Repair Theory

In contrast to published reports by other investigators, adhesions following surgery for tendon repair are necessary for the healing process, an Army scientist has declared.

"Advances in the Surgery of Trauma: Mechanisms of Tendon Healing" was discussed at the third of a series of medical seminars initiated to report advances in medical science at the Walter Reed Army Institute of Medical Research, Washington, D.C.

Capt Austin D. Potenza, Chief, Department of Experimental Surgery, was the principal speaker. He reported on research findings that the use of artificial blocking membranes (polyethylene and Millipore) around a tendon repair site, in order to reduce adhesions, results in delayed union or non-union of the tendon.

A tendon within the digital sheath cannot heal without adhesions at the wound site because other tissues provide the only active healing elements for the tendon, it was stated. Healing is achieved by scar produced by connective tissue cells (fibroblasts) derived from surrounding structures. These cells lay down collagen (the main supportive protein of tendon), which cannot be distinguished from that of the tendon proper by the end of 128 days.

If adhesions can be limited to those of a loose, filmy character which allow tendon healing, but do not restrict tendon motion, the ideal surgical results can be achieved, Potenza said.

Recently developed special techniques by which unnecessary adhesions can be minimized following surgery, and the role of trauma in compromising functional results following tendon surgery, were discussed.

Dr. George W. Hyatt, Professor of Surgery (orthopedics), Georgetown University Medical School, Washington, D.C., led the discussion which followed the presentation.

INITIAL METCALFE AWARD: Capt Austin D. Potenza (left) rereceives the first Raymond Franklin Metcalf Award from Big Gen James H. Forsee, CG, U.S. Army Medical R&D Command. Chief of the Department of Experimental Surgery, Walter Reed Army Institute of Research, Capt Potenza was recognized for research on tendon repair begun in 1959 while an orthopedic resident at Walter Reed General Hospital. The award included an honorarium of $150.

Recently he was elected a Diplomate in the American Board of Orthopedic Surgery. In November 1961, he was the recipient of the Sir Henry Wellcome Medal and a $500 prize for his essay on tendon healing.

The Metcalfe Award was established in memory of the late Brig Gen Raymond Metcalfe, a former commander of Walter Reed Army Medical Center, by his daughter, Mrs. Marjorie M. Nichol.

Indians Outbid 21 Firms, Get Contract on Ammunition Boxes

From basket weaving to manufacturing ammunition boxes is the industrial progress story being written by a band of Chippewa Indians in Wisconsin.

A Department of the Army contract awarded by Joliet (Ill.) Arsenal to the LaCourte Oreilles Chippewa Indians calls for the production of 162,000 boxes for 105 mm. shells.

In competition with 21 firms, the Indians submitted the lowest bid. A Joliet Arsenal official said he believes the contract is the first awarded by a Defense agency to a corporation controlled by American Indians.

Army Invites 500 R&D Leaders to Biennial Science Conference, June 20-22

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Research Office, and the Army Scientific Advisory Panel will comprise the major segment of participants.

Other attendees will represent R&D components of the U.S. Air Force, U.S. Navy, U.S. Marine Corps, other Defense agencies, Department of State, National Bureau of Standards, National Academy of Sciences, National Science Foundation, National Aeronautics and Space Administration, Atomic Energy Commission, National Institutes of Health, and the Supreme Allied Command, Europe.

Authors and titles of 96 scientific presentations scheduled during the conference, selected from more than 400 proposals submitted by personnel of Army in-house facilities, were announced in the December issue of this publication.

Further evaluation by a panel of eminent scientists, each distinguished in a different discipline, will culminate in selection of about 20 presentations for awards at the conference.

Secretary of the Army Stahr has been invited to present honorariums and certificates of merit to authors of outstanding papers as a highlight of the concluding general assembly.

As at previous Army Science Conferences, the Association of the United States Army will contribute substantial honorariums for military personnel presenting prize-winning papers. Awards to civilian winners will be made through the Civilian Incentive Awards Program.

Four invited speakers scheduled to present papers which will not be considered for awards are: Dr. Carl Lamanna, U.S. Army Research Office, "Problems and Progress in the Study of Oral Toxicity of Bacterial Toxins"; Dr. Bruno Papirmeister, U.S. Army Chemical Center, "Effect of Mustard Gas on Gene Functions and Replication"; Dr. Harrison J. Merrill, U.S. Army Signal Corps, "LASER Progress and Applications"; and Dr. Marion B. Sulzberger, Office of The Surgeon General, "Progress and Prospects in Idiophylaxis" (Built-in Self Protection of the Combat Soldier).

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

Conference discussions will be divided into four concurrent sessions each day. Presentations will be limited to 15 minutes each, followed by 5 minutes for questions and answers.

Members of the Senior Scientists Advisory Council will preside at the group sessions, namely: Dr. G. G. Quarles, Office of the Chief of Engineers; Dr. George H. Lee, Office of the Chief of Ordnance; Dr. M. J. Murray, Office of the Chief Chemical Officer; and Richard C. Kerr, Office of the Chief of Transportation.

Sponsored by the Chief of Research and Development, the Army Science Conference is designed to stimulate pride of service by enabling Army scientists to report on research activities before a distinguished assembly of Federal Government scientists; also, to encourage closer cooperation and integration of effort and to enhance the prestige of Army research in the general scientific community.

Materials Experts Study Space Probe Thermal Protection

Exploratory discussions on feasibility and methodology of instituting a "National Test Program of Thermal Protection and Temperature Control Systems" — related to the critical problems of advanced space research —are being held by a NASA-DOD Ad Hoc Group.

Consideration of numerous divergent concepts among the Nation's top scientists concerned with space exploration is an outgrowth of a recent resolution by the NASA Research Advisory Committee on Materials.

The Ad Hoc Group, consisting of representatives of Government agencies and the Armed Services, will recommend whether the proposed program should be implemented and how.

NASA's James J. Gangler outlined various possible approaches to establishing a test program of thermal protection and temperature control systems at the first meeting of the Ad Hoc Group Mar. 22 at NASA Headquarters in Washington, D.C.

Another meeting of the Group is contemplated this month for the purpose of preparing a joint NASA-DOD position on the proposed program.

Under consideration is the advisability of establishing a national center to conduct the program, or to organize closely cooperative and coordinated effort among a number of Government agencies and qualified industrial organizations. A third possibility is to assign research on specific concepts to major participating agencies or under contract to industrial concerns.

The resolution adopted by the NASA Research Advisory Committee on Materials emphasized that "the extreme environments of aerospace vehicle systems necessitate the extensive use of Thermal Protection and Temperature Control Systems and, consequently, accurate design data for the capabilities of such systems." Objectives of the proposed program would include:

- Providing conclusive data as to the capability of various test devices to represent thermal flight environments.
- Producing standard test methods.
- Establishment of clear concepts as to the relative significance of various flight and test parameters.
- Producing design data for a number of typical materials systems.
- Introducing standard terms, symbols and dimensions, representing the thermal capabilities of materials systems.

As proposed, the program would be sponsored jointly by the National Aeronautics and Space Administration and the Department of Defense. A NASA-DOD steering committee would be established to direct and supervise the program, assisted by an advisory panel of consultants.

"In view of its magnitude," the program would be carried out by representatives from the Aeronautical Industries Association, the American Society for Testing and Materials, and the National Academy of Sciences-National Research Council Materials Advisory Board.

Army representatives serving on the Ad Hoc Group are Allan L. Tarr, Physical Sciences Division, U.S. Army Research Office, and Norman L. Reed, Ordnance Materials Research Office, Watertown Arsenal, Watertown, Mass.

OOPS, WE FLUBBED! When the U.S. Army Institute of Dental Research was dedicated at Walter Reed Army Medical Center, Washington, D.C., on the 51st anniversary of the Army Dental Corps, the ceremony took place as Army Research and Development Newsmagazine was rolling off the press. Lt Gen Arthur G. Trudeau was credited in that issue with making the dedicatory address. But a late switch placed his Deputy Director of Research and Development, Maj Gen Dwight E. Beach, in the role of pinchhitter. Shown at the unveiling of the dedicatory plaque are (l. to r.) Brig Gen James H. Forsee, Commanding General, U.S. Army Medical R&D Command; Col George H. Timke, Jr., Institute Director; General Beach, and Maj Gen Joseph L. Bernier, Chief of the U.S. Army Dental Corps.

Contract Shows Speed-Up On Gas-Turbine Aircraft

Stepped-up conversion to gas-turbine engines to power the Army's air fleet is indicated by a recent $21,986,000 follow-on contract for the production of 48 AO-1B Mohawk combat surveillance aircraft. Deliveries are scheduled to begin in January 1963.

First of the Army's fixed-wing aircraft to be powered with turbine engines, the AO-1B is equipped with twin T-53-L-7 turboprops, each rated at 1,100 shaft horsepower (SHP).

Gross weight of the all-metal craft is 13,147 pounds, with a service ceiling of 25,000 feet and cruising speed of 200 knots. Ferry range with external fuel tanks is 1,100 miles.

Designed to operate with troops in the field, the AO-1 is built in A, B, and C models. It carries a pilot and radar operator and can take off from 2,000-foot unimproved airstrips. The B model is designed for use with sidelooking airborne radar (SLAR), and is equipped with ejection seats.

The contract for airframes, design data, provisioning and special tools was awarded to the Grumman Aircraft Engineering Corp., Bethpage, Long Island, N.Y. The engines will be supplied by Lycoming Div., Avco Corp., Stratford, Conn.

Planning Groups Bustling but Keeping Mum on Reorganization

A state of suspenseful animation prevails on activities of working groups formulating precise details of how reorganization of the Army is to be accomplished by mid-1963. That is one way of saying things are buzzing, but no one feels privileged, at this stage of progress, to say exactly what, how or when.

Five formal planning groups, each headed by a general, are hard at work —and have been since they were established Feb. 19 by order of Secretary of the Army Elvis J. Stahr, jr.—in developing proposals for implementing the broad reorganization announced Jan. 16.

Recommendations or suggestions of these groups are being reviewed by an overall Planning Council which is meeting regularly every Monday in The Pentagon at Washington, D.C. As of Mar. 26 the Council had held five meetings. It is headed by Lt Gen David W. Traub, Comptroller of the Army and Project Director for the reorganization.

Leonard W. Holscher, Deputy Comptroller is designated a Special Assistant to the Project Director. He headed the high-level group of some 60 Army officials in developing the broad reorganization program over a period of approximately eight months. Deputy Project Director is Brig Gen Robert N. Tyson, Director of Organization and Management Systems in the Office of the Comptroller.

Although General Traub also is chairman of the group on reorganization of Headquarters, Department of the Army, he has only a single vote on the Planning Council. Powell Pierpont, General Counsel, Department of the Army, is serving on the Council, as the representative of the Secretary of the Army.

Other voting members are Lt Gen James P. Daley, Combat Developments Command; Maj Gen Frank S. Besson, Jr., Materiel Development and Logistics Command; Maj Gen Richard D. Meyer, U.S. Continental Army Command; and Maj Gen G. E. Martin, Office of Personnel Operations.

Memorandums from the Office of the Project Director to all planning group chairmen, dated Feb. 23 and Mar. 8, outline administrative procedures and prescribe the functions of the Planning Council. The Feb. 23 memo states the function as "evaluate reorganization progress, anticipate future requirements, and facilitate planning decision-making." It further states:

"The Project Director will publish Reorganization Planning Directives to planning groups and existing staff agencies as a means to assign responsibility for completion of requirements related to the reorganization, to provide planning guidelines, and for appropriate purposes. . . ."

Mar. 19 was P-Day, the designation for the beginning of implementation of reorganization plans developed by the working groups. Activation of the new major components of the Army is scheduled at the beginning of the quarter subsequent to the completion of the planning phase.

For the Combat Developments Command and the Office of Personnel Operations, activation is expected no later than July 1, 1962. Six months following activation each of the commands is to be operational. Another six months will be allowed for the "modification phase."

Decision on a survey study report submitted to the Project Director's Office on Mar. 20 by the DCSLOG site selection committee on heaquarters for each of the major commands had not been announced at press time.

Each of the planning groups is composed of representatives of the Technical Services, Office of the Chief of Research and Development, Deputy Chief of Staff for Operations, Assistant Chief of Staff for Intelligence.

Maj Gen Rush B. Lincoln (center), Deputy Chief of Transportation, talks with Maj Gen Norman H. Vissering (right), U.S. Army Transportation Training Command, and Col T. L. Poole, Jr., Commanding Officer, Combat Development Group, and president of Fort Eustis Chapter, National Defense Transportation Association. Lincoln explained Army reorganization effect on the TC.

Navy Schedules Open House To Show Advances in R&D

An open house review of research achievements at the U.S. Naval Research Laboratory is scheduled Apr. 12 and 17, from 9 a.m. to 3:50 p.m., to show advances in electronics, materials and nucleonics.

Invitations have gone out to officials of the Department of Defense, the Congress, and key personnel in research activities at the Army and other Government agencies.

Special buses will leave from stairwell A-7 at the Pentagon concourse at 8:15 a.m. and from the 17th street bus stand at the rear of the Main Navy at 8:30 a.m. Individuals using buses and private automobiles should arrive at the Laboratory, near Bolling Field, by 8:45 a.m. Lunch will be available at the Laboratory.

In addition to the formal presentations, the open house will include visits to the Nuclear Research Facility, the Plasma Physics Laboratory, and the 5-million-volt Van de Graaff positive-ion accelerator and auxiliary experimental apparatus (two-meter electrostatic beam analyzer and a magnetic reduction-particle analyzer).

CmlC Labs Pick Dr. Sim New Deputy Director

Dr. Van Murray Sim has been appointed Deputy Director of Medical Research at the U.S. Army Chemical Research and Development Laboratories, Army Chemical Center, Md. Chief of the Clinical Research Division since 1955, he succeeds Dr. David Bruce Dill, who retired Apr. 30, 1961.

With his new title came a substantial salary increase when Dr. Sim was raised to PL-313 status. A native of Cashmere, Wash., he earned premedical bachelor's and master's degrees at the University of Washington, and received a Ph.D. degree from St. Louis University School of Medicine.

During World War II he served as a U.S. Navy medical officer in the Pacific and in China, and was recalled to active duty in 1952 as liaison officer to the Army Chemical Center for the Navy Bureau of Medicine and Surgery and the Office of Naval Research. When he was retired from active service in 1954, he was retained at the laboratories as a civilian medical officer.

Dr. Sim is a member of Alpha Sigma Nu medical fraternity and is president-elect of the Army Chemical Center Branch of the Scientific Research Society of America.

Dr. Van Murray Sim

President Selects Besson, Daley, Hinrichs to Head Army's New R&D Commands

(Continued from page 1)

Hinrichs is the President's selectee to be Commanding General of the new Supply and Maintenance Command. The position of Chief of Ordnance is to be abolished along with the positions of chiefs of the other Technical Services, except for the Engineer Corps and the Medical Service.

As this publication went to press, the indication from the unofficial comments of members of the permanent planning groups on Army reorganization was that four other commodity commands will be established—Mobility; Electronics; Missile; and Munitions.

General Besson, 51 years old, is known as an aggressive, hard-driving military leader who has pioneered concepts aimed at injecting greater speed and efficiency into the Army transportation system. He was graduated from the U.S. Military Academy in 1932 and received an M.A. degree from the Massachusetts Institute of Technology.

Known as the "fluid dispersion studies," concepts advanced by General Besson were initiated while he served as Assistant Chief of Transportation for nearly five years, following his return in 1948 from a Far East Command assignment as Chief of Transportation.

The "fluid dispersion" system calls for routine use of air transportation through development of an air fleet geared to rapid mobility requirements under all conditions. It also provides for employment of an express surface transport, fuller use of special purpose containers, vehicles, materials handling equipment, and ships of radical design. Certain of these concepts are currently operational.

General Besson was assigned to SHAPE from 1954-58, first as Assistant Chief of Staff, Logistics, and later as Assistant Chief of Staff, Programs. His performance in formulating logistics plans and overall programs to meet the complex requirements of the 15 nations of the NATO alliance earned him the Distinguished Service Medal.

From 1940-43 General Besson supervised development of war-time engineer equipment, becoming Assistant Director and General Manager of the Third Military Railway Service in Iran and, later, the Commanding Officer. Promoted to brigadier general and awarded the Legion of Merit, he was at that time, and until the end of World War II, the youngest general officer in the ground force.

LT GEN JOHN P. DALEY was graduated from the U.S. Military Academy in 1931, following the profession of his father, General Edmund L. Daley, West Point Class of 1906, and his grandfather, Col H. J. Koehler, for many years Master of the Sword at the Academy.

General Daley's assignments have progressed from command of horse-drawn artillery units to command of Army missile units. He is a graduate from the Field Artillery School, the Command and General Staff School, and the National War College.

From 1934 to 1942 he served as an instructor in the Military Academy Department of Physics and in 1946 returned for an additional year as professor of physics. He became an instructor at the Army War College in April 1950, remaining until he was assigned to Korea in August 1952.

In Korea, General Daley's service during the 1952 fall campaign, the Third Korean Winter and the Korea Summer-Fall 1953 campaigns earned him an award of the first Oak Leaf Cluster to his World War II Legion of Merit. He won a second Oak Leaf Cluster for his service as Chief of Staff of the United Nations Military Armistice Commission from June 1953 to March 1954, serving also for a part of this period as a member of the Commission.

Upon return to the United States in March 1954, General Daley became artillery commander of the III Corps at Fort Hood, Tex. In March 1955 he was assigned to the Office of the Chief, Research and Development, Department of the Army. As Director of Special Weapons he was responsible for Army R&D in air defense, guided missiles, space projects, and in atomics.

LT GEN JOHN H. HINRICHS took command Apr. 2, 1958, as the 20th Chief of Army Ordnance in the 146-year history of the Corps. A veteran of 34 years of Army service, he was graduated from the U.S. Military Academy in 1928, from Massachusetts Institute of Technology in 1932 with a B.S. degree in Mechanical Engineering, from the Ordnance School in 1933, from the Army Industrial College in 1937, and from the National War College in 1948.

Son of an Army Ordnance officer, General Hinrichs was born July 10, 1904, at the old Sandy Hook Proving Ground, N.J., where his father was serving at that time. From 1928 to 1931 General Hinrichs served with the Tenth Field Artillery at Fort Lewis, Wash., and from 1933 to 1936 was assigned to Aberdeen Proving Ground, Md., as a Proof Officer on tank-automotive, artillery, and bomb section projects.

General Hinrichs holds the Legion of Merit and the Bronze Star Medal.

Army-wide Letter Stresses Opportunities In Secretary of Army Fellowships Study

All U.S. Army major commands and Chiefs of Technical Services are advised of career-development opportunities presented through the Secretary of the Army's Research and Study Fellowships in a letter dated Mar. 8, 1962.

Signed by order of Secretary Elvis J. Stahr, jr., and accompanied by a just-off-the-press brochure on the SARS Fellowship Program, the letter states that the program was established in 1956 "to encourage the discovery, development and increased use of the best creative talents among outstanding career employees."

Given on a highly selective basis, SARS Fellowships (not less than 6 and not more than 12 months of full-time study) enable participants to make substantial contributions to the Department of the Army through independent research, and provide "development opportunities of the highest type for increasing their personal capabilities."

Directed to the attention of activity heads and their respective executive and managerial staffs, as well as to potential participants in the SARS program, the brochure carries an open letter signed by Secretary Stahr which states, in part:

"We in the Army recognize our obligation to provide employees with the opportunities for their growth and development. Experience has shown that the greatest incentive contributing to the development and retention of outstanding employees is derived from the opportunity to participate in activities which permit creative thinking in the enhancement of their abilities.

"These Fellowships provide a significant means for accomplishing this objective. By making available opportunities for research and study in fields vital to Army missions, mutual benefits accrue both to the individual and to the Army.

"I take this opportunity to congratulate all of those who have previously received these Awards, and to welcome future applicants. To those officials who have encouraged and assisted the talented candidates for these Awards, I also wish to express my sincere appreciation."

Prepared in the Office of the Deputy Chief of Staff for Personnel, the brochure outlines objectives of the SARS Fellowships as:

- Uncover basic creativity and encourage creative attitude toward Army problems.
- Recognize past achievement and potential.
- Emphasize discovery, development, and increased use of the best talents we already have.
- Provide substantial contributions toward accomplishing Army missions.
- Further the reputation of the Department of the Army as an employer.

Hon. Elvis J. Stahr, jr.

The brochure points out that since inception of the SARS Program, a total of 65 Fellowships, an average of 12 a year, shows the following distribution: Public Law 313 employees, 1; GS-16, 1; GS-15, 10; GS-14, 16; GS-13, 24; GS-12, 12 GS-11, 1.

Listed among representative SARS Fellowship projects from which the Army is benefiting—and will continue to benefit—are:

PHYSICAL AND BIOLOGICAL SCIENCES

- A physicist conducted research to determine the properties of crystalline materials.
- A chemist studied the behavior of matter in the solid state, specifically as it relates to the fundamental behavior of explosives.
- A physicist pursued research in the field of atmospheric turbulence.
- A food technologist made a study of food dehydration preservation methods.
- A mycologist conducted research in identification of cellulose-destroying fungi.

ENGINEERING

- A chemical engineer prepared an engineering concept and evaluation of biochemical systems for the supply of food within the space vehicle during long-range space flights.
- A mechanical engineer developed techniques and mathematical models for the evaluation of weapons during the research and development cycle that will be operationally sound and compatible with the future tactical and organizational doctrines of the Army.
- A human factors engineer made a study of the relationship between military equipment design and operator efficiency.
- A mechanical engineer developed guidelines, handbooks, and possible military standards regarding producibility, production planning, tooling, and production review of drawings and specifications concerning heavy construction equipment.

SOCIAL SCIENCES

- A military historian made a comparative study of national approaches to war planning and coalition strategy since World War II.
- An educational adviser developed a manual on linguistics for use in training non-English speaking troops stationed in oversea installations.
- A military intelligence consultant studied the evolution of the military institutions of NATO—their current vitality and future promise.

In conclusion, the brochure states:

"The Research and Study Fellowships provide one very significant means by which outstanding Army career employees can be stimulated and aided in their efforts toward self-development by substantially increasing the number of developmental opportunities for those employees whose potential has been established by achievement and purpose."

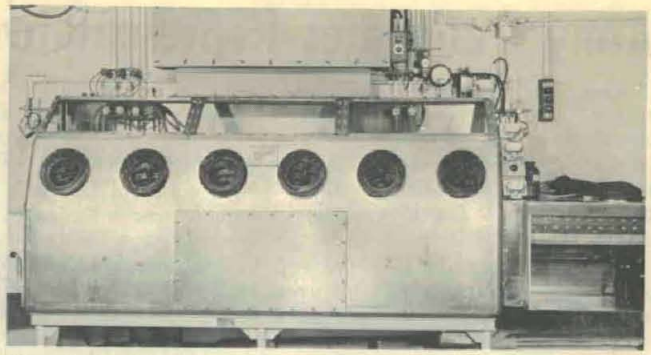
Management Center Schedules Project Administrator Course

The introductory 3-week R&D Project Administrator's Course (400-6-F33), designed for Army personnel with R&D procurement responsibilities, will begin July 9 at the Army Logistics Management Center, Fort Lee, Va.

Scaled for students with rank of major and above (civilians GS-11 and above), the course will cover the special characteristics of RDT&E procurement, the steps in the procurement process and the capabilities and limitations of R&D project management under various types of contracts.

Tentative opening dates for the course are July 9, Aug. 20 and Nov. 26 in 1962; Mar. 4, Apr. 15 and June 10 in 1963.

Technicians wearing protective clothing conduct bio-assay tests in a toxic munitions systems chamber at U.S. Army Chemical Corps Research & Development Laboratories.



Transfer cabinets, such as shown above, are utilized for specialized microbiological operations to insure safety of workers at the Chemical Corps Biological Laboratories.

CmlC Scientist Cites General Need Of Safety in Microbiological Labs

Few microbiological laboratories that handle infectious microorganisms are adequately designed, equipped, and administered for personnel safety. This is the major conclusion drawn in the recently published results of a year-long study of safety in a cross-section of the world's microbiological laboratories.

The study was conducted by G. Briggs Phillips, Safety Division, U.S. Army Chemical Corps Biological Laboratories, under a Secretary of the Army Research and Study Fellowship. During his year of study, Mr. Phillips visited 111 laboratories in 60 cities in the United States and 17 foreign countries and interviewed over 400 laboratory administrators, scientists, and technicians.

Specific objective of the study was to collect and analyze information on microbiological laboratory safety to allow a realistic evaluation of present status and future needs.

Of 102 laboratories studied in detail, which handled infections microorganisms, only four were considered to be completely adequate and sufficiently proficient in all aspects of microbiological safety. Most important and frequent difficulties encountered were:

- Failure to integrate safety objectives and policies into the laboratory program.
- Lack of understanding of the mechanisms of aerosol formation during common laboratory procedures.
- Lack of understanding and acceptance of laboratory design principles, preventive techniques, and safety equipment.

Laboratory-acquired infections were a serious problem in the majority of the laboratories studied. Tuberculosis and Q fever were the most frequent cause of these infections. However, 29 other diseases, headed by brucellosis, psittacosis, and tularemia, also were involved.

Sixty-nine percent of the laboratories were operated without any kind of active or directed microbiological safety program. Sixty-five percent did not even apply basic accident and injury prevention principles generally used in non-laboratory situations. Only 55 laboratories used safety cabinets, and, of these, less than 10 used cabinets of adequate design.

Swedish laboratories had a uniformly high standard of microbiological safety. Adequately designed laboratory buildings exist in Denmark, Finland, Sweden and the U.S.

While conducting the study, Mr. Phillips also presented 46 illustrated lectures on microbiological safety at some of the laboratories he visited.

These lectures were based on safety procedures and programs developed and used at the U.S. Army Chemical Corps Biological Laboratories, Fort Detrick, Frederick, Md., recognized as a world leader in microbiological laboratory safety.

The detailed report resulting from the study states, "Considering the various available approaches for improving safety in handling infectious microorganisms, critical experimental evaluations should be conducted to determine:

- Under what conditions improvement in microbiological safety techniques and equipment is desirable to reduce or eliminate human infectious hazards.
- Under what conditions changes are unnecessary.
- Under what conditions changes in technique or equipment are desirable to protect experimental or diagnostic validity, or the purity of the biological product.
- Whether changes made in technique or equipment actually are effective."

The report also recommends that, to the greatest degree possible commensurate with its other responsibilities, the Chemical Corps make available the results of its safety research to all groups engaged in similar work in the interest of worldwide microbiological laboratory safety.

The report, "Microbiological Safety in U.S. and Foreign Laboratories," will be available to qualified requestors from the Armed Services Technical Information Agency. Non-governmental agencies and individuals will be able to purchase the report from the Library of Congress, Photo-Duplication Services, Publication Board Project, Washington 25, D.C.

Secretary of Army Fellowship Scientist Attends Meet at President's Invitation

On President Kennedy's invitation, G. Briggs Phillips, Assistant Chief, Agent Control Branch, Safety Division, Fort Detrick, Md., attended the President's Conference on Occupational Safety, Mar. 6-8, in Washington, D.C. The theme was "Safeguarding Human Worth."

The Conference brought together in the Nation's Capital more than 3,000 leaders of American industry, labor, agriculture, Federal, State, and local governments, insurance, education, science, health, and private safety organizations of the Nation.

Purpose of the conferees was to devise and then apply voluntary, cooperative means for reducing the 13,800 deaths and nearly 2,000,000 disabling injuries occurring annually because of on-the-job accidents.

Program emphasis underscored the fact that 80 percent of all job injuries occur in non-manufacturing activities. Delegates concentrated on safety problems in such lines of work as agriculture, construction, trade and service businesses, materials handling, and Government.

Army Designates Representatives to Materials Advisory Board

Army representatives to the Materials Advisory Board (MAB), National Academy of Sciences-National Research Council, were designated in mid-March in a notice to Chiefs of the Technical Services and other Army R&D activities.

Members selected will represent the Army-wide positions in the area of materials research, but will have no vote on any issue before the MAB Panel. Generally they will participate in matters other than technical, such as furnishing information on the Army materials program, organization and policy. However, they may participate in technical discussions in areas where they have competence.

Army Materials Advisory Committee (AMAC) task groups were established recently to function outside of the regular AMAC meetings for periodic review of technical plans under consideration by AMAC. Several of the members of the task groups also are among newly named Army representatives to MAB.

Lt Col Louis G. Klinker, U.S. Army Research Office (USARO) action officer for Materials R&D, Dr. I. R. Hershner, Chief of the Physical Sciences Division, USARO, and Dr. S. J. Magram, Chief of the Chemicals and Materials Branch, USARO, are designated as member and alternates, respectively, to MAB.

Army representatives to MAB committees, with the member, first and second alternates in that order, are:

General Committee on Review of DOD Materials (R&D)—N. R. Reed, Chairman of the Army Materials Advisory Committee, Dr. S. J. Magram and Allan L. Tarr, USARO.

Committee 1, Materials Requirements for Advanced Design—James Murray, Army Research Office—Durham (AROD), Allan L. Tarr and George Darcy, Ordnance Materials Research Office.

Committee 2, Metallic Materials—Dr. Peter Kosting, Office of the Chief of Ordnance, A. L. Tarr and J. J. Burke, Watertown Arsenal.

Committee 3, Organic Materials—Dr. George R. Thomas, Quartermaster Research and Engineering Command; Dr. B. S. Fisher, U.S. Army Research Office, and Dr. A. W. Harvey, Quartermaster R&E Command.

Committee 4, Inorganic and Nonmetallic Materials—E. F. Clark, Office of the Chief of Engineers, A. L. Tarr and Dr. Benedict Levin, U.S. Army Signal Research and Development Laboratory (USASDRL).

Committee 5, Fundamental Aspects of Materials Research—Dr. Sherwood Githens, AROD, Dr. S. J. Magram and Dr. Peter Kosting.

Committee 6, Fabrications and Processing—P. A. Carbonaro, Watertown Arsenal, A. L. Tarr and R. B. Koehler, Office, Chief of Ordnance.

Committee 7, Evaluation and Testing Methods—D. E. Driscoll, Watertown Arsenal, Lt Col L. G. Klinker and George Darcy, Ordnance Materials Research Office.

Working Groups on Electronics Materials—Dr. S. B. Levin, USASDRL, Maj H. A. Davis, Jr., USARO, and P. J. Franklin, Diamond Ordnance Fuze Laboratories.

Working Group on Composite Materials—Dr. S. B. Levin, Lt Col L. G. Klinker, USARO, R. B. Koehler, OCO.

Working Group on Beryllium—Stuart Arnold, Watertown Arsenal, A. L. Tarr and R. B. Koehler.

Panel Reviews Nominees For Achievement Awards

Nominations for the second annual Army Research and Development Achievement Awards, to be presented in June, are under preliminary review in the Manpower and Personnel Division, Office of the Chief of Research and Development. A panel of top scientists will judge winners.

Army Regulation 672-304, dated Jan. 29, 1962, titled Army R&D Achievement Awards, prescribes the basis of selection. The 27 men who shared in presentation of 22 awards in 1961 were selected for achievements during a prior 5-year period. Winners this year will be chosen only for work performed during calendar year 1961.

Any scientist, engineer or technician (or groups), who is paid by Department of the Army appropriated funds, may receive an R&D achievement award provided he is "directly responsible for a significant scientific or engineering achievement."

An achievement will be considered significant when it establishes a scientific basis for subsequent technical improvement of military importance, and/or materially improves the Army's technical capability, and/or contributes to national welfare.

The AR further states that an award may be made when scientific or engineering leadership is provided "of such quality and effectiveness as to have advanced materially the research and/or development accomplishments of a technical activity, group, or project."

Signal Corps Testing 10-Pound 'Flashlight Radar'

Detection of enemy movement a mile away in any weather, day or night, appears simple for the soldier equipped with an experimental 10-pound "flashlight radar" under development by the Army Signal Corps.

An impressive demonstration of the precise distinguishing capabilities of the device, about the size of a portable typewriter, was given early in March in Washington, D.C.

Expected to cost between $1,500 and $2,000 a unit at the outset of production, the device is designed for frontline surveillance, is easy to operate, and at a distance up to a mile and a quarter can differentiate between a man walking or merely swinging his arms.

A Signal Corps official said the set is capable of penetrating "light foliage" but would not be useful in heavy jungles. It consists of two tubes, transistors and miniaturized circuits powered by a lightweight belt battery good for 12 hours of continuous operation.

Sensitivity of the set distinguishes, for example, between a tank and a truck or other type of vehicle. The radar sound also varies in proportion to the speed of the approaching vehicle. For prolonged surveillance from a strategic point, the unit can be mounted on a tripod.

Development of the unit at the U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J., has been in progress for about two years. It is estimated that another two years will be needed before it is ready for adoption.

Army's "flashlight radar" provides precise detection of enemy advances.

Tripartite Leaders in Materials Research Convene in England

Seven U.S. Armed Forces leaders in the field of materials research and development are participating in a 2-week session in England of the Tripartite Technical Cooperation Program Panel P4 on Methods of Test and Evaluation.

International Chairman of Panel P4 is Lt Col Louis G. Klinker, Chemistry and Materials Branch, Physical Sciences Division, U.S. Army Research Office. Col Klinker said the U.S. Army has the "majority interest" in DOD and international management of the test and evaluation portion of the TTCP program in materials research and development.

The group will visit a number of English laboratories, including the Atomic Energy Research Establishment, Rolls Royce, Ltd., the Materials Research Laboratory at Waltham Abbey, Essex, the Armaments R&D Establishment at Fort Halstead, Kent, and the Admiralty Materials Laboratory at Holton Heath.

The members of Panel P4 convened in London on Apr. 2 and will conclude the tour of laboratories in time to hold three days of business sessions at the Admiralty in London before adjourning on Apr. 13.

Other U.S. Army, Air Force and Navy materials scientists taking part in the sessions in England are: Dr. S. D. Bailey, Director, Pioneering Research Laboratory, Quartermaster R&E Command, Natick, Mass.; David Driscoll, Watertown Arsenal scientist internationally known in the field of nondestructive testing of materials;

J. A. Kies, Bureau of Weapons engineer and a recognized expert in testing and evaluation procedures in materials research J. J. Murray, Chief of the Engineering Sciences Division, U.S. Army Research Office—Durham; F. S. Williams, Chief of the Materials Group, Air Materials Center, U.S. Navy, Philadelphia, Pa.; and W. J. Trapp, Chief, Evaluation Branch, Materials Central, Wright Air Development Center, Dayton, Ohio.

Defense Department Announces ASPR Revision To Provide Contractor Incentives, Penalties

Action designed to provide Department of Defense contractors with greater incentives to control costs and improve performance is prescribed in Revision No. 8 of the Armed Services Procurement Regulation, as announced in a DOD news release Mar. 20.

The revision sets forth policies concerning selection and use of various types of contracts for military procurement, with the stated objective of reducing costs in Defense contracting. This is to be accomplished through a contractual system of rewards and penalties in terms of quality of performance of the product, timeliness of delivery and effectiveness of cost controls.

The new policies emphasize greater use of firm fixed-price and incentive contracts and decreased use of cost-plus-fixed-fee contracts. Present contract types which do not impose risks upon contractors and provide for desirable incentives are being discontinued or are being substantially reduced. The cost-plus-fixed fee contract generally will be used only for accomplishment of basic research projects and in work only when no other type of contract will meet requirements.

Special emphasis by the Department of Defense is directed to a major reduction in use of cost-plus-fixed-fee contracts in development of major weapons and equipment. Instead, contracts will be heavily weighted with performance incentives.

The Defense position is that both the Government and its contractors should be concerned with harnessing the basic profit motive of business enterprise, and to work for the truly effective and economic contract performance required in the interest of National Defense.

USAERDL Scientist Earns Achievement Award

Outstanding work in organic coatings, surface chemistry and solid state physics has won Emil J. York the first Annual Award for Scientific Achievement presented by the Fort Belvoir Branch of the Scientific Research Society of America.

A senior scientist in the Materials Branch of the U.S. Army Engineer R&D Laboratories, Fort Belvoir, Va., Mr. York is presently engaged in conducting basic research on solar radiation for missiles and jet plasma studies for metals. A graduate of the University of Pennsylvania, he was employed in private industry prior to joining USAERDL in 1955.

Emil J. York

Army Sets Up R&D Office For Tropical Research at Fort Sherman, Canal Zone

Establishment in Panama of a U.S. Army Research and Development Office at Fort Sherman, Canal Zone, was announced by Department of the Army General Order No. 13, dated Mar. 22.

The new facility is designated as a Class II activity under the Chief of Research and Development. Administrative and logistical support will be provided by the Commanding General, U.S. Army Caribbean (USARCARIB).

Staffing of the Office with nine civilian and four military scientists will be completed as rapidly as possible. The Office will include a Research Branch and a Test Branch. Its mission is to coordinate and facilitate the program of tropical research, development, testing and evaluation activity planned for the future.

Activities at the Center will include tropical testing of the Pershing missile system, target acquisition research, RDT&E of ground mobility equipment, communications studies, development of packaging and preservation methods, and research on clothing, human factors and tropical medical requirements.

Fort Sherman is the headquarters of the Jungle Warfare Training Center, U.S. Army Caribbean. The area comprises about 56 square miles of the Canal Zone, bounded on the east and south by the Canal and Gatun Lake, on the west by the Canal Zone boundary and north by the Caribbean Sea. The military reservation proper occupies one-third of this area.

U.S. Antarctic Advisory Committee on Names Makes 4 Changes

International differences in geographical designations of certain regions of the Antarctic will be resolved if recommendations made in mid-March by the U.S. Antarctic Advisory Committee on Names are adopted.

Most controversial area insofar as terminology is concerned has been the large peninsula of Antarctica extending toward South America. The British have called it Graham Land, to the United States it has been the Palmer Peninsula, and Chileans have accorded it just about the highest honor possible for them by naming it O'Higgins Land. Discovered around 1820, it has been explored by expeditions of many nations.

When the U.S. recommendation to redesignate the area as the Antarctic Peninsula comes up for international adoption, it is reasonable to assume that, aside from Britain, strenuous opposition may come from Chile. To them that grand old Irish name (this being written in the spirit of the occasion, on St. Patrick's Day) is almost sacrosanct. To them he was their Thomas Jefferson, George Washington, Abraham Lincoln and Patrick Henry all rolled up in one.

The three other "impersonal names" recommended by the U.S. Antarctic Advisory Committee on Names are East Antarctic, West Antarctic, and the Transantarctic Mountains. Actually, these names refer to the eastern and western hemispheric areas, and the mountains separating them. The West Antarctic is the primary zone of U.S. research activities.

The Advisory Committee on Antarctic Names serves the United States Board of Geographic Names, which was created by Congress in 1947 to be responsible with the Secretary of Interior for standardization of geographic names.

The Committee currently is composed of Dr. Kenneth J. Bertrand, Catholic University, Chairman and Antarctic historian; Dr. Meredith F. Burrill, Director, Office of Geography, Department of the Interior; Herman R. Friis, Special Assistant to the Chief Archivist, National Archives, and until recently Chief of the Cartographic Records Division; Dr. Albert P. Crary, Chief Scientist, U.S. Antarctic Research Program, National Science Foundation; Fred G. Alberts, Secretary of ACAN, Department of the Interior; Dr. Harry Dater, Historian, U.S. Antarctic Projects Office; Dr. P. A. Siple, Army Research Office.

Chief Signal Officer Maj Gen R. T. Nelson presents Meritorious Civilian Service Award to H. D. Sheitleman.

CSigO Presents Sheitelman Meritorious Service Award

Henry D. Sheitelman, Chief of the U.S. Army Signal Corps Drone Systems Section, was recognized recently for outstanding performance of duty when he was presented the Meritorious Civilian Service Award.

Maj Gen R. T. Nelson, Chief Signal Officer, presented the award to the 20-year veteran of the Federal Civil Service career program. Mr. Sheitelman has been with the Office of the Chief Signal Officer in the Pentagon, Washington, D.C., since December 1955.

The accompanying citation credited Mr. Sheitelman with a notable contribution to the overall mission of the Signal Corps from June 1960 to June 1961. He is a member of the International Radio Engineers Association, a native of Brooklyn, N.Y., obtained a B.S. degree from Brooklyn College, and earned an M.S. degree from Columbia University.

USAERDL Employees Nominated for Honors

Rudolph P. Savage of the U.S. Army Engineer Beach Erosion Board was presented one of three National Capital Awards made by the District of Columbia Council of Engineering and Architectural Societies and the Washington Academy of Sciences during Engineers' Week.

Savage received the outstanding young engineer award. Among other contenders were Eugene S. Burcher, an employee of the U.S. Army Geodesy, Intelligence and Mapping Research and Development Agency, Fort Belvoir, Va., and William W. McGeorge, Jr., U.S. Army Engineer Research and Development Laboratories (USAERDL).

John Johnson, Chief of the Research Section in the Warfare Vision Branch, USAERDL, was nominated for the National Capital applied scientist award. The award was won by Dr. Albert I. Schindler, U.S. Naval Research Laboratory. Johnson was recognized for his work in developing a program and methods for evaluating the overall performance of night-vision devices.

Burcher was nominated for his work as project engineer in developing techniques of using ground tracking stations for satellites to establish mapping positions on the earth's surface. McGeorge was recognized for his work in developing a basic plan for testing heavy-duty, air-transportable, all-weather, multi-purpose, high-speed, rubber-tired construction tractors, and in preparing specifications for their manufacture.

In 1961 the National Capital Award for the outstanding young applied scientist went to USAERDL's Dr. J. Thomas Cox, and in 1959 USAERDL employee Horace Leathers won the outstanding young engineer award.

John Johnson

William McGeorge

Army Nuclear Reactor Expert Named 'Young Engineer of Year'

The award of "Young Engineer of the Year" was bestowed upon John J. O'Connor, Chief of Nuclear Operations at the Ordnance Materials Research Office, Watertown, Mass., during the Engineers' Week seminar.

For the past 11 years, the National Society of Professional Engineers has sponsored Engineers' Week throughout the United States to focus attention on the contributions which the engineering profession has made to national defense, productivity and technological progress.

Joining in a salute to Mr. O'Connor were the Engineering Societies of New England, Boston Alumni Chapter of Eta Kappa Nu Association, Massachusetts Society of Professional Engineers, and the New England School Science Advisory Council.

A native of Massachusetts, Mr. O'Connor received a B.S. degree in Physics at Boston College in 1950. He began his career in 1951 at the Army Ballistics Research Laboratory at Aberdeen (Md.) Proving Ground.

While assigned to the Laboratory, he participated in the atomic test program. He designed and supervised the installation of electronic equipment and recorders at bomb sites to measure ground shock waves resulting from the detonation of atomic weapons.

Transferred to the Watertown Arsenal Laboratory, he was assigned the responsibility of determining the feasibility of constructing a nuclear reactor for Ordnance Corps research on materials. During this time he

John J. O'Connor

was assigned to the Oak Ridge School of Reactor Technology where he took an intensive 1-year course on reactor design and technology.

In 1954 he was appointed project engineer for the design of the Ordnance Corps nuclear reactor for materials research. This involved supervision, hazards analysis and architectural-engineering work, and design of special auxiliary facilities.

In 1955 Mr. O'Connor accepted a guest appointment to the Nuclear Engineering Department of the Brookhaven National Laboratory, and was engaged in testing experimental reactor designs of various types.

In 1956 he was a guest of the Chemical Engineering Department of the Massachusetts Institute of Technology. There he undertook critical mass and shielding calibrations in connection with the design of the MIT research reactor.

Since 1958 he has devoted all his efforts to supervising construction and operation of the Ordnance Corps reactor, a 1-megawatt swimming-pool type.

Registered as an engineer in Massachusetts, he is a member of the American Nuclear Society, Secretary of the Northeastern Section of the American Nuclear Society, and is also a member of the Research Reactor Committee, National Research Council.

OSWAC Picks Dr. Kaufman as Chief Scientist

Dr. J. V. Richard Kaufman is the new Chief Scientist for the Ordnance Special Weapons-Ammunition Command. The appointment was announced by Maj Gen W. K. Ghormley, Commanding General.

An employee of the Army's Picatinny Arsenal since 1949, Dr. Kaufman served until his recent promotion as deputy chief for explosive research in the Arsenal's Propellants and Explosives Laboratory.

Dr. Kaufman studied for a year at the University of Reading in England under a Secretary of the Army fellowship.

He holds a B.S. degree in chemistry from Dickinson College, Carlisle, Pa., a Ph.D. degree in inorganic chemistry from Massachusetts Institute of Technology, and is a member of Phi Beta Kappa, national honor society, and Sigma Xi honor society.

Dr. J. V. Kaufman

CRD Urges Widespread Use Of SAE Consultative Aid

Consultative services of the Society of Automotive Engineers (SAE) in working with Army research and development activities for solution of technical problems in automobiles, aviation, aerospace and material research are available without charge, and should be used more widely.

Lt Gen Arthur G. Trudeau stated this viewpoint recently following a meeting in which he joined with several members of his staff to discuss with SAE officials the opportunities for more effective liaison.

SAE Technical Board Secretary M. Leroy Stoner briefed the Army officials on the Society's international activities, especially on standardization in the automotive field.

The Society participates in certain American, British, Canadian (ABC) standardization projects and is interested in Pan American automotive activities. It is expanding international activities in automotives, aviation and aerospace.

SAE advances were reported in the field of engine noise, value engineering, air mobility, turbines, numerical control systems for machine tools, material trends, and support equipment.

OCRD officials, Maj Gen George W. Power, Director of Developments, Col Alexander J. Rankin, Chief, Air Mobility Division, and Col Allen D. Hulse, Chief, Combat Materiel Division, joined in presenting a series of technical problems for discussion.

Items included difficulties in standards and specifications for Army aircraft, noise suppression in turbo-shaft engines and turbine requirements, and standardization of horsepower ratings for military vehicles.

SAE participants included Frank Fink, President, William Burrows, Chairman of the Technical Board, Joseph Gilbert, General Manager, and Leroy Stoner.

Researchers Find Means of Ridding Water of Chemical Agents

Simple methods of decontaminating water from known chemical agents which might be used by the enemy on troops in the field have been developed through U.S. Army Corps of Engineers and Chemical Corps R&D teamwork.

Isopropyl methylphosphonofluoridate, for example, could have disastrous consequences if added to water used by troops. Known by its trade name of Sarin, or simply as GB, this so-called "nerve agent" developed by German scientists prior to World War II causes convulsions, paralysis and death, unless quickly treated.

GB-dosed water now can be made safe for human consumption, nontoxic, potable, and even palatable, using a method developed by Virginia Bauer and Joseph Epstein, chemists at the U.S. Army Chemical Research and Development Laboratories, Army Chemical Center, Md.

Seeking chemical defenses against the possibility of water supply contamination with toxic agents, the Bauer-Epstein team joined with Corps of Engineers personnel in testing the Army's standard mobile water purification process to treat GB-contaminated water.

Laboratory experiments demonstrated that soda ash or calcium hydroxide acted to speed the chemical breakdown of GB in water at warm or moderate temperatures. In cold water, extremely strong chlorination did the trick, followed by carbon filtration to remove the excess chlorine.

The investigations yielded a new phenomenon in chlorine chemistry, which the Chemical Corps scientists have reported in professional journals. They found that the chlorine remained unchanged after accelerating the chemical breakdown of GB, although in usual water purification processes the chlorine is destroyed by its action on impurities.

In a report on their findings, the researchers stated that some chemical agents mixed with water decompose rapidly to nontoxic substances and therefore present little danger. Other agents are rendered harmless by the regular process of water purification. Still others, though extremely toxic if inhaled, are dangerous in water only in such large quantities and concentrations that effective contamination of large bodies of water or reservoirs would be an unlikely occurrence, it was stated.

Laboratory findings of Miss Bauer and Mr. Epstein on decontamination processes were carried to the U.S. Army Corps of Engineers, which has the job of operating water supply equipment and insuring that water delivered to troops is safe.

Field tests using the Engineers' ultramodern recently developed purification equipment, augmented by the new superchlorination-dechlorination treatment, were effective against GB and other known chemical agents that might be used by an enemy force.

CRREL Personnel Locate At Hanover Despite Fire Damage to New Facilities

Consolidation of the U.S. Army's major cold weather test agencies by relocating them in new facilities at Hanover, N.H., has been delayed six to eight months by heavy fire damage to the new building.

Originally scheduled for completion in January, the move into the new facilities now appears impossible until at least early fall.

Corps of Engineers officials declined to venture an estimate on the total damage to the new building caused by a fire early in January. Extent of the damage, in fact, is the subject of a controversy between the insurance company and the contractor which is delaying repairs.

Further questioning brought out that the contractor contends that he cannot guarantee proper operation of the cold chambers unless all of the electrical circuits for the refrigeration system are replaced, due to water damage. The insurance company is disputing this claim.

Meanwhile, transfer of approximately 175 personnel from the Corps of Engineers' Snow, Ice and Permafrost Research Establishment (SIPRE) at Wilmette, Ill., and the Arctic Construction and Frost Effects Laboratory (ACFEL) at Waltham, Mass., is virtually complete. They are occupying a temporary building at Hanover.

As stated by this publication (January 1961, page 2), the decision to establish the Cold Region Research Engineering Laboratory at Hanover, as a consolidation of SIPRE and ACFEL, was the culmination of studies initiated by the Army in 1953.

Possible sites throughout the northern part of the United States were surveyed with respect to existing and potential advantages. Selection of the Hanover site was influenced partially by the polar library and research laboratory at nearby Dartmouth College, and by the proximity of the Quartermaster Research and Engineering Center at Natick, Mass.

In traditional Army response to a major disaster, Aberdeen Proving Ground (APG) provided emergency aid to Eastern Shore area during March storm that destroyed or damaged many thousands of homes in Maryland and Virginia. One DUKW, one Super DUKW, and one M-37 weapons carrier were dispatched for rescue operations to Chincoteague Island in Virginia. Standing near a Super DUKW are members of the Proving Ground relief operations crew (l. to r.) Charles G. Norman, Robert L. Clarke, Charles L. Dewey, Jay L. Atkins, and Edward G. Plummer, all APG civilian employees.

White Sands Missile Range Official Honored By 'Early Birds' for 50 Years as Aviator

Dave Gregg, 66, World War I pilot now employed at White Sands Missile Range, N. Mex., was honored recently by the "Early Birds" for his 50th year of flying.

The Early Birds, an organization of pioneer aviators who flew solo prior to Dec. 17, 1916, presented Gregg a bronze plaque "in absentia" because he was unable to attend the ceremony in San Diego, Calif.

Currently Deputy Chief of the White Sands Range Instrumentation Development Division, Integrated Range Mission, Gregg started test flying gliders in 1910. He soloed for the first time in a powered aircraft, the first he had ever seen, Apr. 18, 1912.

The Early Birds roster includes 470 members of whom possibly 300 are still living. Members who are known nationally for aircraft manufacturing include Glenn Curtiss, Allan Lockheed, Edward Stinson, Glenn Martin, Clyde Cessna, Louis Bleriot, Louis Brequet, Anthony Fokker, Grover Loening and Orville Wright.

Among Early Birds who made aviation headlines 50 years ago are Mrs. Albert Heinrich, who sold the first commercial airplane in the U.S., and Frank T. Coffyn, its pilot. Others include Igor Sikorsky, who flew the first helicopter; Earle Ovington, who flew the first airmail; Matilde Moisant, first woman to fly the English Channel; Carl T. Spaatz, one of the Nation's foremost Air Force generals; Lansing Callan and Cliff Webster, early seaplane pilots.

Gregg was among the first American pilots to go overseas during WW I and served with the 86th Squadron, Royal Flying Corps. Following the war and his return to the U.S., he received his Expert Aviators Certificate and civilian flying permit.

With the creation of the Civil Aeronautics Administration, he was awarded his pilot's license with land and water ratings, which he holds today. Also, he holds a British Federation Aeronautique Internationale competitive license, RFC wings, and wings from the Aviation Branch, U.S. Army Signal Corps.

During WW I his machinegun synchronizer broke and he shot the propeller off his own plane. Consequently, he made a "dead stick" landing from 18,000 feet altitude at night. That was quite a feat because aircraft then had neither radio nor lights.

Before the war, like Tom Sawyer, he attended his own wake. This happened after he failed to reach his destination during a cross-country flight and was presumed dead. By the time he walked in from the remote, desolate area where he had made an emergency landing, the mourning had begun.

Dave Gregg

Gregg came to White Sands Missile Range in 1952 from Teterborough, N.J., where he was chief research engineer for Bendix Aviation for 18 years. At WSMR, he served as technical director for Electro Mechanical Laboratories and then moved to Integrated Range Mission as civilian chief. Prior to his present position, he served as staff assistant and chief scientific consultant for IRM.

Graduated from Harvard University's engineering school in 1918, Gregg did graduate work in military aeronautics at Queens College in England. He holds more than 100 issued patents on equipment, including superchargers, automatic engine controls, hydraulic equipment, de-icers and pressurized flight suits—a forerunner of those in use today for space travel.

USAERDL Employee Returns Space Instruments by Glider

A glider rather than a parachute is the solution reached by a U.S. Army Signal Research and Development Laboratory employee to the problem of ensuring safe return of instruments sent aloft by balloons for meteorological research.

Delbert A. Deisinger recently received a patent on his invention. Whereas instruments dropped from weather balloons by parachute may be lost or damaged, his device controls the glider by an automatic homing system operating with a ground radio transmitter.

Provocative Ponderables

". . . Training a young man or woman in science and technology has never been, is not, and never will be enough. Unless we also continue to emphasize and inculcate sound humanistic values, we will end up with a society of soulless robots who might as well be communists as anything else."—Secretary of the Army Elvis J. Stahr, jr.

* * *

"The imagined conflict between science and religion is largely based on misunderstanding by both sides. Man's whole search for truth must include both religious science and physical science. Each is incomplete without the other."—Dr. Robert H. Dinegar, Los Alamos chemist ordained as a Protestant Episcopal priest.

* * *

"New opinions are always suspected, and unusually opposed, without any other reason but because they are not already common."—John Locke, English philosopher.

* * *

"Research and teaching are like the wheels of a bicycle. Both are essential. Both should be going the same way at the same speed. At present, research is the big wheel. I suggest, not that we put the brake on this, but that we increase the size and speed of the teaching wheel. Our main business is not only to see what lies dimly at a distance but also to do what lies clearly at hand."—From a letter in Nutrition Reviews by Daniel B. Stone.

Services Race in Developing Aerial Reconnaissance Unit

Reconnaissance and reporting of enemy maneuvers within as little time as two minutes is the goal of friendly inter-Service competition at the U.S. Army Electronic Proving Ground, Fort Huachuca, Ariz.

Tri-Service evaluation of airborne photo scanning and transmission equipment is directed toward determination of a single piece of equipment that will serve surveillance needs of each of the Armed Forces for in-flight transmission of photo data.

Equipment developed by each of the Services is being tested to evolve electronic devices that will enable scouting of the enemy at any altitude by photography, and flash a picture 200 miles or more in less than two minutes from the time the shutter clicks.

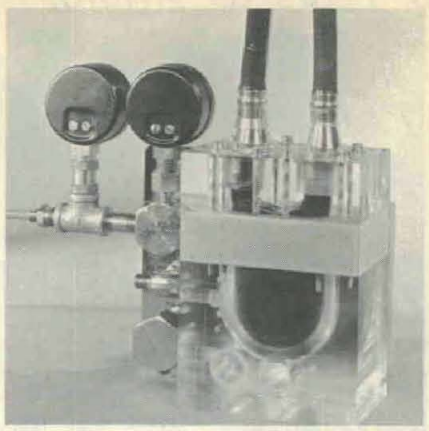
Eminent Surgeons Acclaim Army's New Heart Pump After Tests

U.S. Army designers and developers of an artificial heart pump precisely controlled by fluid amplification principles—encouraged by the belief of eminent open-heart surgeons that it presents great potentialities—are preparing for its first public demonstration before the American Society for Artificial Internal Organs.

When the Society convenes at Atlantic City, N.J., Apr. 13-14, Lt Col Timothy G. Barila will present a paper titled, "A Blood Pump Powered and Controlled by a Fluid Amplification System." Dr. Barila also will be prepared to give a report and answer questions regarding significant results using the pump on live animals in recent operations. He is scheduled for a similar presentation at Walter Reed Army Hospital in Washington, D.C., before the annual symposium on "Current Surgical Practices," Apr. 9-14.

Chief of the Walter Reed Army Institute of Research Department of Resuscitation, and Assistant Director of the Division of Clinical Surgery, Dr. Barila is a member of the Army team of civilian and military scientists that designed and developed the fluid amplification system heart pump in the past 15 months.

Credited with inventing the new pump's basic features is Kenneth E. Woodward, 34, who undertook the project as his first major research assignment at the Army's famed Diamond Ordnance Fuze Laboratories in Washington, D.C. There the world-wide-interest-arousing principles of fluid amplification controls were developed and first announced in March 1960. *(See feature article, page 22, February 1961 issue of this publication.)*



Control element employing the principles of fluid dynamics, regulates flow of the experimental heart pump.

In August 1960 Wilbur S. Hinman, Jr., who was then Technical Director of the Diamond Ordnance Fuze Laboratories and who became Assistant Secretary of the Army (R&D) in November 1961, suggested that research should be conducted to find applications other than industrial for the principles of fluid amplification. As a result, application in a heart pump was conceived and suggested to Mr. Woodward.

In the same November 1961 issue of the *Army Research and Development Newsmagazine* that announced Hinman's appointment as DASA (R&D), the development of the prototype of the new fluid amplification system heart pump was reported in a feature on pages 6-7 describing its operational advantages.

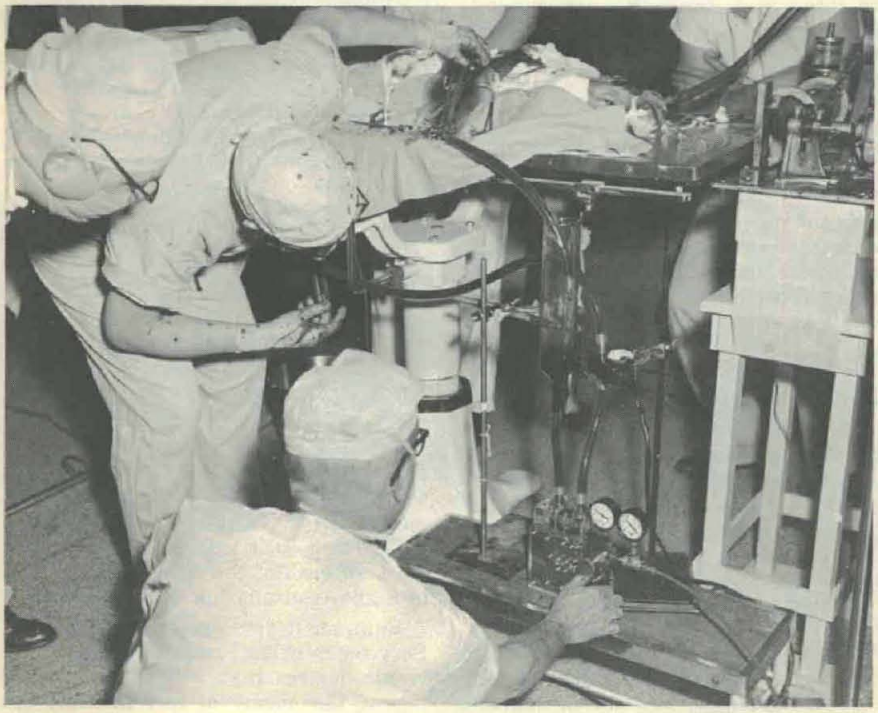
That article emphasized, as explained by Mr. Woodward and Dr. Barila, that the Army's heart pump research, now funded by the Office of The Surgeon General, probes the problem of giving field treatment to wounded soldiers—of keeping them alive until they can be cared for in general hospitals. As is true of many products of Army research and development, however, the application to civilian community requirements appears important.

When the new heart pump was subjected to its first critical experiment, on Feb. 14, 1962, in Cleveland, Ohio, successful results "more than exceeded our expectations," as expressed by Dr. Barila, Mr. Woodward and Captain D. Nunn, who accompanied them. Dr. Nunn, a Reserve Officer now on active duty, is serving as Dr. Barila's coworker on the WRAIR part of the developmental team; a heart surgeon, he is assigned as an investigator in the WRAIR Department of Experimental Surgery.

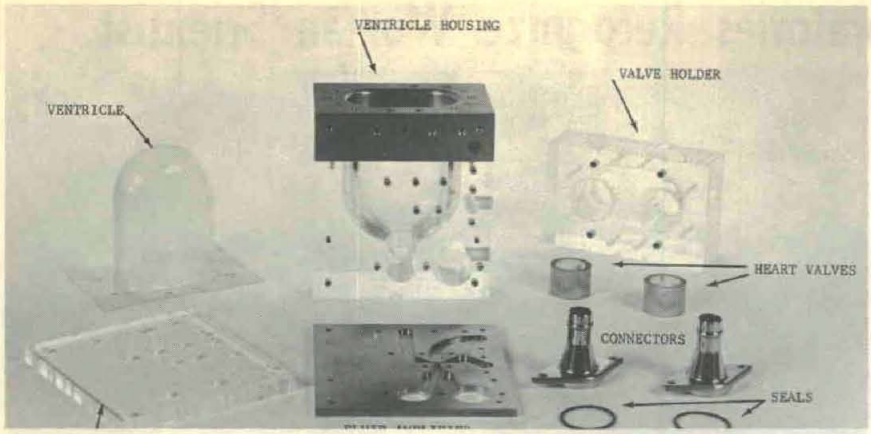
That demonstration helped one of the Nation's foremost experts in development of artificial organ replacements, Dr. William Kolff of the Cleveland Clinic, to perform an artificial heart transplant and sustain the life of a dog during a 2-hour experiment.

Recognized for development of a number of artificial exterior replacements for organs in the human body, Dr. Kolff currently is experimenting with an artificial heart made of plastic. During World War II he improvised the first "artificial kidney," a device which like the Army heart pump was operated outside of the body, fashioning it out of "a couple of tin cans."

Commenting on the Army heart pump used in the Cleveland Clinic heart transplant on a dog, Dr. Kolff said it "compared very favorably with any of the available commercial heart



Artificial heart pump controlled by fluid amplification is shown in a recent Cleveland Clinic demonstration in which a heart transplant was performed successfully on a dog for a 57-minute experiment by Dr. William Kolff.



Basic elements of Army's fluid interaction heart pump shown here depict its simplicity and ease of operation. The life-like characteristics of the intricate functioning of the human heart are achieved without use of moving parts except for artificial ventricles and tricuspid heart valves incorporated in pump.

Live Animal Experiments Indicate Capabilities

pumps." Because of the scarcity of donors of hearts for transplants in other humans when medical techniques are perfected, Dr. Kolff believes an artificial heart will be developed, and that the Army heart pump presents exciting possibilities for this development.

Following the Feb. 14 successful operation on the dog — which prompted one observer to comment, perhaps a bit wishfully and possibly a bit prophetically, "the Army has given the Nation a new heart on Valentine's Day"—Dr. Kolff wrote a letter to the Commanding General, Medical Research and Development Command, Office of The Surgeon General, Department of the Army.

In that letter Dr. Kolff stated, in part:

". . . During an earlier visit to our laboratory, we tested one of the pumps brought to us by Mr. Woodward and found that in terms of blood damage as measured with hemolysis it could be compared with the very best pumps we have ever tested.

"During a recent demonstration visit Mr. Woodward, Lt Col Barila, and Capt Nunn, we entrusted the extracorporeal circulation (and the life) of one of our very best animals to this pump. I am glad to report that it worked well. I am very much impressed by the progress made so far. I believe that an important step forward can be made by the further adaptation of fluid amplification techniques.

"The ultimate test of a good pump would be to place it inside the chest of a dog and to prove that it can sustain the circulation for a prolonged period of time. I believe that it would be well worth the efforts of Mr. Woodward if he would concentrate on this particular problem.

"I believe that he is closer to the realization than he himself believes, and I believe that the encouragement that could be obtained by placing these pumps inside the chests of dogs and by sustaining the dog's life for many hours with it will open the eyes of any skeptic to the major possibilities of this device. . . ."

Dr. Kolff's letter closed with an invitation to send members of the Army developmental team on the heart pump to the Cleveland Clinic for a series of experiments "to speed up this problem. . . . I am sure that the fruits of it will reflect on the overall importance of the use of these pumps to the military application."

Another meaningful demonstration of the Army heart pump was given at the Cleveland Metropolitan Hospital, Western Reserve University, on Feb. 15, the day following the Kolff experiment. Again, the results exceeded expectations, according to Lt Col Barila who stated:

"For more than two hours the Army heart pump took over the function of the left half of the heart—thereby pointing up its potential use in clinical surgery and in traumatic surgery or shock. It is conceivable that, eventually, it may be useful in every ambulance to save the life of a patient being rushed to a hospital. It also has promising value in a mass disaster to keep patients alive until surgeons can care for them."

The second demonstration was given for Dr. George H. A. Clowes, Jr., Associate Professor of Surgery at the Cleveland Metropolitan Hospital, who is recognized for developing one of the best artificial lungs in the country. One of his difficulties has been "wedding" his lung to commercially available blood pumps for support of the heart for long-term perfusion procedures. He believes the Army heart pump offers a prospect of overcoming that problem.

In a written report to superiors on the demonstration for Dr. Clowes, Mr. Woodward stated:

"The pump was used in a left heart by-pass closed circuit animal test to demonstrate the pump's characteristics. The test lasted for two hours without deterioration of the animal. The animal was breathing on its own. Wink reflexes were good. Blood pressures were adequate. It was determined that the duration of the pump's systole could be caried without affecting pulse rate. . . . Changes in the animal's peripheral resistance caused the pump to stop pulsing intermittently, allowing the animal's blood flows to catch up with the pump. This did not appear to harm the animal. . . ."

A third demonstration of the Army heart pump was given in Cleveland to Dr. Claude S. Beck, 67-year-old researcher recognized as "one of the real leaders" in surgical treatment of coronary heart disease and resuscitation. Dr. Beck was reported to be most favorably impressed by characteristics of the pump.

Famed as the surgeon who first reversed a heart in convulsion (ventricular fibrillation) in 1947 to save the life of a 14-year-old boy who "died" while on the operating table, Dr. Beck has since performed numerous similar operations. The boy is still alive and healthy, as is a former dentist associate of Dr. Beck who "dropped dead" in 1956 while leaving the hospital at which they worked. The "fatality" occurred only a few feet from the entrance—"another six steps and he really would have died" —so that prompt treatment by Dr. Beck reactivated the heart.

Recently a 90-minute television presentation titled "How to Reverse Death" was presented to an estimated 3,000,000 Cleveland area viewers to report on spectacular results of Dr. Beck's heart action revival method.

A fourth demonstration at WRAIR on Feb. 28 was arranged at the request of Dr. Charles Kirby, a noted heart surgeon on the University Hospital staff in Philadelphia, Pa.

As a result of grapevine reports in medical circles on the series of live-animal tests using the Army heart pump, mounting interest in its possibilities is reported by Dr. Barila. A number of requests are being received for models of the pump to be used in scientific experiments.

CmlC Biological Laboratories Recognize Woman Scientist

When other Army R&D installations are singing the praises of their women scientists for notable achievement, the U.S. Army Chemical Corps Biological Laboratories can join in behalf of Dr. Dorothy G. Smith.

In recognition of her work as Chief of Virology Branch 1, Virus and Rickettsia Division at the Fort Detrick, Md., research center, Dr. Smith was awarded a Certificate for Meritorious Civilian Service in November 1961. She also was an Army nominee for the 1962 Federal Women's Award sponsored by the U.S. Civil Service Commission.

Listed in the *American Men of Science* as well as in *Who's Who of American Women*, Dr. Smith is the author or coauthor of 29 publications on various microbiological subjects, and is a Charter Fellow of the American Academy of Microbiology.

Other professional affiliations of Dr. Smith include the New York Academy of Science, the Scientific Research Society of America, American Society for Microbiology, Society of Experimental Biology and Medicine, and Sigma Xi.

Prior to joining the staff of the Chemical Corps Biological Laboratories in 1947, she had worked with the Memingococcal Meningitis Commission, the Merck Institute for Therapeutic Research, as a research assistant in chemotherapy at Johns Hopkins School of Hygiene and Public Health, as a Lasker Foundation Research Fellow, and in Rutgers University Department of Microbiology.

When Brig Gen Fred J. Delmore, CG, U.S. Army Chemical Corps R&D Command, presented the Department of the Army Certificate and Meritorious Civilian Service Award to Dr. Dorothy G. Smith, Chief, Virology 1 Branch CmlC Biological Laboratories, coworkers honored her at a luncheon. Left to right, Dr. LeRoy Fothergill, Scientific Adviser, Col Carl S. Castor, Commanding Officer, Dr. Smith, General Delmore, Mrs. Alice L. Smith (award winner's mother) and Dr. Riley D. Housewright, the Laboratories' Scientific Director.

After attending Radcliffe College, Cambridge, Mass., for three years, Dr. Smith started her scientific career as a laboratory instructor in anatomy while enrolled at Queen's University, Kingston, Ontario, Canada, where she obtained a B.A. degree in chemistry in 1940. After graduating she remained at the university as a laboratory technician for the Canadian National Research Council, Department of Bacteriology. Graduate studies at Rutgers University, New Brunswick, N.J., later earned her a Ph.D. degree in microbiology.

Backed by 15 years experience in Federal Civil Service as a Department of the Army employee, Dr. Smith believes a career in Government science has enabled her to use her broad training to good advantage.

Chemical Corps assignments, in her opinion, have utilized effectively her capabilities in experimental therapy of infectious diseases, in research on therapeutic activity of existing and newly discovered antibiotics and chemotherapeutic agents, and in other scientific investigations contributing to the advances being achieved by the Biological Laboratories.

Army's New Heart Pump Successes Prompt Requests for Use in Research

(Continued from page 19)

For example, Dr. Clowes addressed a letter to Capt Nunn dated Mar. 5 which stated in part:

". . . . This strikes me as an interesting idea you people have developed in a first-rate fashion. If and when you have several of these pumps constructed, why not send us one and let us carry out some of our long-term perfusions with the new membrane oxygenator. This might be the ideal combination for both emergency and long-term partial perfusion. . . ."

Under consideration for favorable action at the earliest possible date is a request from Lt Col (M.D.) Alan R. Hopeman, Chief of the Thoracic Surgery Service at the U.S. Army's William Beaumont General Hospital, El Paso, Tex., for one of the pumps for use in experiments at that institution.

Prophetic of the possibilities now presented by the Army heart pump was an article which appeared in the April 1956 issue of *American Scientist*. Authored by Dr. Robert P. Glover and Dr. Thomas J. E. O'Neill, the article was titled "Surgery's New Frontier—The Heart." Dr. Glover, then Director of the Cardiovascular Research Laboratory at Presbyterian Hospital and Dr. O'Neill, at that time Clinical Assistant Professor of Surgery at Women's Medical College of Pennsylvania, presented a visionary view of possibilities of mechanical correction of failing human hearts.

In reviewing the results of the recent live-animal experiments using the Army heart pump, Dr. Nunn pointed out that it now has been demonstrated successfully that the pump can be used:

- With an oxygenator as a complete by-pass of the heart and lungs.
- To by-pass one side of the heart, which does not necessarily require an oxygenator.
- As a partial by-pass of one side of the heart, to support a failing heart —particularly applicable to support the heart of a wounded soldier in shock, or to support the heart in cases of failure from other causes.

More of the excitement about possibilities of the Army heart pump seems to be generating in the outside medical community than in the minds of the Army R&D team responsible for its design and development. Kenneth Woodward, "Tim" Barila and Capt Nunn have in common a tendency toward under- rather than over-statement of the pump's present capabilities, as well as a belief that a great many refinements and improvements remain to be made.

Supporting this belief is the progress on refinements that has been made during the past three months, largely as a result of Drs. Barila and Nunn pooling their knowledge of the physiology of the human heart and body with Mr. Woodward's creative scientific thinking.

Army Lets Contracts Totaling $284 Million

Contract awards aggregating more than $284 million for development and procurement of military materiel were announced recently by the Department of the Army.

Two contracts totaling $64,369,241.31 were awarded to FMC Corp., San Jose, Calif., for 2,832 M113 armored personnel carriers.

The Chrysler Corp., Detroit, Mich., received a $28,408,005 contract to produce 305 of the new M60 main line battle tanks and a $1,463,228 contract to manufacture 494 1-ton trucks.

A $25,110,645 contract was awarded to Harrington and Richardson, Inc., Worcester, Mass., for production of 224,503 M-14 rifles.

A $20,270,650 contract let to International Harvester Co., Chicago, Ill., calls for production of 4,000 5-ton M39 tactical trucks.

Sperry Rand Corp., Salt Lake City, Utah, received a $12,749,491 Army order for Sergeant missiles and ground equipment.

Production of 8,598 man-carried tactical radios (PRC-25) is ordered in an $11,482,143 contract to RCA, Camden, N.J. RCA also was given a $2,999,731 contract for engineering tests for a micromodule production system.

Continued development of the Shillelagh, a surface-to-surface guided missile system, is the basis of a $10,204,894 contract let to Ford Motor Co., Newport Beach, Calif. Ford Motor Corp., Dearborn, Mich., received a $1,832,243 contract for 1,341 cargo trucks.

A $10,188,600 contract awarded to Consolidated Diesel Electric Corp., Stamford, Conn., is for production of 290 LARC-5 (lighter, amphibious, resupply, cargo) 5-ton vehicles.

Compudyne Corp., C. W. Reagan, Inc., and Acme Missile Construction Co., all of Hatboro, Pa., received a $9,369,580 joint contract from the Corps of Engineers to construct an aero space simulator at the Arnold Engineering Development Center, Arnold Air Force Station, Tullahoma, Tenn.

Two contracts totaling $7,404,199 went to the Allison Division of General Motors Corp., Indianapolis, Ind., for production of 572 transmissions for self-propelled vehicles and 1,215 steering units for T114 armored reconnaissance vehicles.

For the production of 13,830 M-60 machineguns, the Saco-Lowell Shops, Boston, Mass., were awarded a $5,932,825 contract.

A $5,234,821 contract awarded to Continental Motors Corp., Muskegon, Mich., is for production of 305 engines and power pack assemblies for M60 tanks.

A $3,948,308 contract given to Greenhut Construction Co., Inc., Pensacola, Fla., calls for construction of a research and development facility for the Army Ordnance Missile Command at Redstone Arsenal, Huntsville, Ala.

Four contracts totaling $8,315,310 let to Raytheon Manufacturing Co., Lexington, Mass., call for production of radars and 24 high-powered illuminators and RDT&E for the Hawk missile system, and for a field tests plan for the experimental ARPAT interceptor.

Classified contracts included two awards to Sylvania Electric Products Co., Mountain View, Calif., totaling $6,422,619; Philco Corp., Philadelphia, Pa., $1,700,000; Control Data Corp., Minneapolis, Minn., $1,500,000; Minneapolis Honeywell Regulator Co., Hopkins, Minn., $1,390,417.

Action Manufacturing Co., Philadelphia, Pa., received a $2,268,397 contract for metal fuze parts. Geta, Inc., Yonkers, N.Y., has a $2,004,698 contract for production of 4,057 cargo trailers, and a $1,961,497 contract to Norris-Thermador Corp., Los Angeles, Calif., is for production of 105 mm. cartridge cases.

Aerojet General Corp., Sacramento, Calif., received a $1,865,179 contract for production of metal parts for Hawk missile rocket motors.

Chrysler Corp., Detroit, Mich., received a $4,671,868 contract for the production of cargo trucks and a $1,836,900 contract for range finders and computers for the M-60 tank. A $4,003,103 contract went to Continental Motor Co., Muskegon, Mich., for production of engines and power pack assemblies.

RCA, Camden, N.J., was awarded two contracts totaling $5,511,804 to produce mobile field communications radio sets and equipment to be used in testing missile system components.

Raytheon Co., Lexington, Mass., received a $3,546,413 contract for Hawk missile support equipment.

For the development of air and ground equipment for the USD-1 drone, Bell Aerosystems Co., Buffalo, N.Y., received a $1,753,780 contract.

The Firestone Tire and Rubber Co., Akron, Ohio, has a $1,340,865 contract to manufacture rubber track shoe assembly sets for M-48 and M-60 tanks.

A $1,136,916 contract went to American Cystoscope Makers, Inc., Pelham Manor, N.Y., for telescopes for the M-48 and M-60 tanks.

Burroughs Corp., Detroit, Mich., was awarded a $1,000,000 classified contract.

Additional contracts included: Ziegler Corp., Cleveland, Ohio, $1,550,524 for producing metal parts for fuzes; Ford Motor Co., Dearborn, Mich., $1,516,884 for 880 platform and stake trucks; Longines-Wittnauer Co., New York, N.Y., $1,467,300 to manufacture fuzes; Northrop Corp., Van Nuys, Calif., $1,350,000 to produce 240 target missiles; Goodyear Tire and Rubber Co., Akron, Ohio, $1,228,099 for tires; Aerojet General Corp., Downey, Calif., $1,113,141 and Central Foundry Co., New York, N.Y., $1,051,143 for ammunition; Stewart Warner Corp., Chicago, Ill., $1,094,879 for 250 ground-to-air voice communication radios; Admiral Corp., Chicago, Ill., a $1,000,000 increase in an existing contract to produce the man-carried tactical AN/PRC-10A radio.

Defense Officials Put Onus On Brochuremanship Abuse

An increasingly prevalent practice of "brochuremanship" among defense contractors has drawn sharp criticism from Secretary of Defense Robert S. McNamara.

In a recent note to Deputy Director of Defense (R&E) John H. Rubel, Secretary McNamara deplored the use of fancy brochures to dazzle military procurement officers.

Corrective action was initiated promptly by Mr. Rubel. In a strongly worded directive, he has advised procurement officers that Secretary McNamara wants shorter development time, lower costs in RDT&E, and better performance in weapons and military equipment.

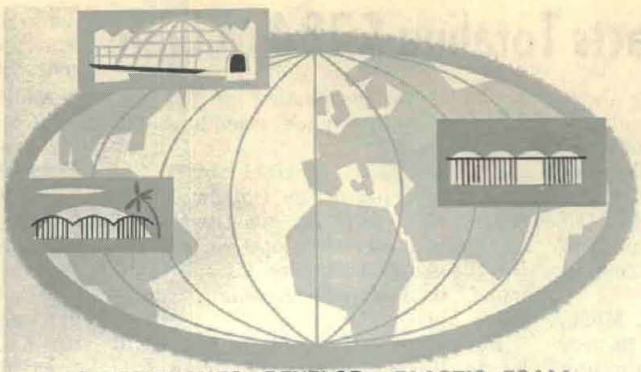
Instead of offering bright promises, defense contractors should demonstrate solid performance on current work, Mr. Rubel stated. He directed the Armed Services to be more consistent in their requirements, based on the "true needs of the fighting men and the true capabilities of industry and technology."

Maj Gen Conway Reassigned

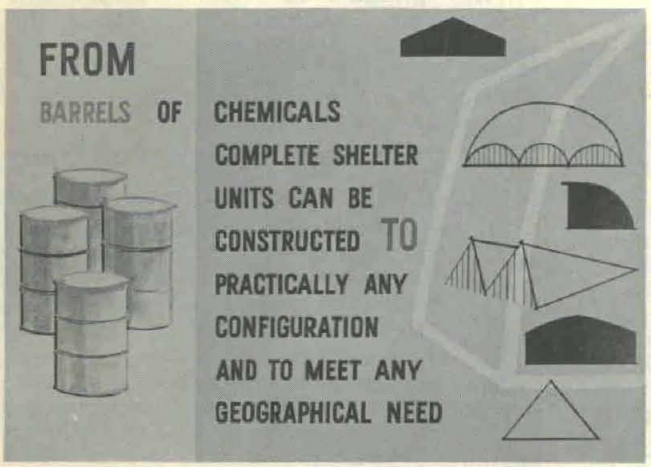
Maj Gen Theodore J. Conway, Commander of the 82nd Airborne Division, has been appointed to head the U.S. Assistance Group in Thailand, effective July 1962.

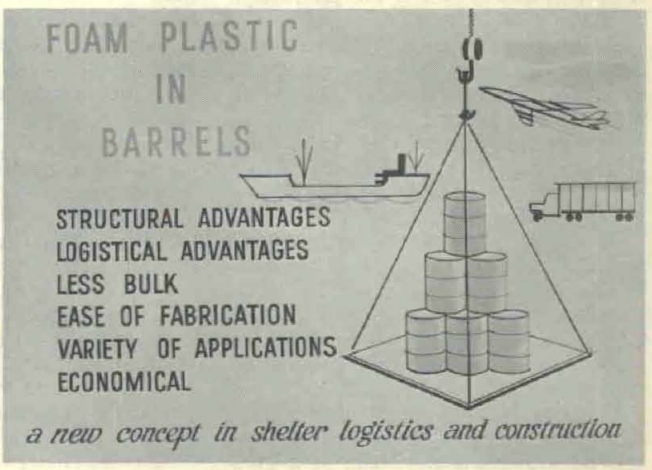
General Conway was the first Director of Army Research. Upon completion of a full 3-year tour of duty on the staff of the Chief of Research and Development, he was succeeded Mar. 9, 1958 by the present incumbent, Maj Gen William J. Ely.

BUILDINGS IN BARRELS ACCLAIMED BY 3 AWARDS



AS TECHNIQUES DEVELOP – PLASTIC FOAM CAN REVOLUTIONIZE ARMY CONCEPTS IN BUILDINGS AND SHELTERS





Army research on the "Buildings in Barrels" concept has won the highest honors of the Society of the Plastics Industries, in the form of three awards presented at the recent SPI conference in Chicago.

The display which won the First Award for Building Construction, the Grand Merit Award for Application of Reinforced Plastics, and the Owens-Corning Fiberglas Reinforced Plastics Design Award, was arranged by the U.S. Army Engineer Research and Development Laboratories.

Leading representatives from design, engineering and editorial fields who served as judges joined in predicting widespread use of the "Buildings in Barrels" concept by both military and civilian developers.

The Owens-Corning Award, a crystal sculpture entitled "Counterpoise" by Steuben, recognized the Army's research efforts on foamed, reenforced plastics for "originality of application, material selection, utility, moldability and appearance."

The Army concept is a radical departure from conventional materials in buildings design. It was developed in response to a need for readily transportable, easily erectable structures at the Army's Camp Century "City Under the Snow" in Greenland. Polyurethane plastic foam compressed into barrels produces 30 times its volume when mixed with chemicals at the construction site.

Tests of the practicality of the concept for long-term housing in remote areas currently are in progress in the main snow trench at Camp Century and in a 1,000-foot tunnel dug into a glacier at Camp Tuto, 138 miles away over the Greenland Icecap.

A test shelter was built at each site, using molds fabricated by S. B. Swenson, Chief of the USAERDL model shop. Army researchers report results to date have exceeded their most favorable expectations.

The pilot models were formed by a bucket brigade pouring method. Recent developments permit feeding from mixing machine to molds.

Castings of polyurethane foam with protective fibrous glass polyester skin can be molded or sprayed into all shapes. Weighty and expensive support materials are unnecessary since the plastic cores are self-supporting in structural design. For added strength, the mixture may include fiberglass or similar materials. Density of the core may be varied (e.g., 5-pound density for floors, 2-pound density for walls) since its strength is proportional to density.

S. Goldfein, Chief of the Plastics Section, Materials Branch, is conducting further tests of the material. It can be made fire resistant by manipulating the molecular structure of the foam and skin laminate, or by incorporating flame retardant additives with minor, compensatable detriment.

Experiments conducted simultaneously at Fort Belvoir, Va., Fort Wainwright, Alaska, Yuma, Ariz., and the Canal Zone show the substance is chemically stable. It has low moisture absorption and in common properties (e.g., conductivity) is three times more effective than cork. It is adversely affected only by light, but a 1/32-inch-thick fiberglass laminate skin protects it fully from light as well as from insects, animals and human abuse.

While strengthening the casting,

the skin also halts the foam's proclivity to increase its thermal conductivity in time due to diffusion.

L. W. Shanahan, Chief of the USAERDL Climatic and Research Test Branch, stressed that although originally stimulated by Arctic research, the concept has equally promising potential for tropic and desert areas. In fact, the castings which require post-curing in heated rooms in the Arctic are ready for immediate use in hot areas. Insulation properties, he said, would cut costs for cooling equipment. He envisions the concept as one answer to the need for inexpensive, easily constructed housing in Latin America and Asia.

Although still considered under development, the Buildings in Barrels Concept is being adapted for future civilian and military applications. For example, it is believed the material should be a boon to the manufacture of insulated containers for dispensing prepackaged food items, particularly where unusual shapes are in demand.

Researchers believe it is likely that as the price of the chemicals drop and mixing techniques are simplified, the "do-it-yourself" field may capitalize on the possibilities of building on-the-spot furniture and boats—design being limited only by the human imagination.

Col J. H. Kerkering, USAERDL Director, and S. B. Swenson, Chief of the Model Shop and Developmental Fabrication Branch, admire award won by the Laboratories for experimental "buildings in barrels" logistic concept.

New Method Detects Effect of Nerve Gas

A new and highly accurate electrical method of measuring the level of a vital body chemical called cholinesterase has been developed by U.S. Army Chemical Corps scientists.

Cholinesterase, one of the most important enzymes, enables the normal stop-and-go transmission of nerve impulses for muscle control. Poisoning by certain insecticides and some liver disorders markedly alter the cholinesterase action in man.

The proposed new system, a development of the Army Chemical Research and Development Laboratories in Maryland, is the first illustration of the use of an electrochemical method in studying enzymatic body reactions. Results of the research on cholinesterase were reported at the national meeting of the American Chemical Society in Washington, D.C., by 1st Lt George G. Guilbault.

The technique was developed in a search for a rapid, accurate and simple means of detecting anticholinesterase toxic agents of warfare. An electrical current is passed through a solution of acetylthiocholine iodide, the sulfur analog of the chemical material in the body which causes the nerve impulse to activate the muscles. When cholinesterase is added to the solution, the acetylthiocholine is hydrolyzed and a drop in electrical voltage is recorded.

This voltage change, per unit time, is a direct measure of the amount of cholinesterase present. The measurement is made rapidly and with a high degree of accuracy. The technique also lends itself to automatic operation, a requirement of detection systems.

The proposed electrochemical method is not a specific one, Lt Guilbault said, but should prove to be a useful tool for following any reactions where an electroactive chemical compound decomposes to yield other compounds that have different voltages.

The research work was performed at the Army Chemical Center by Lt Guilbault, an Army research chemist with a Ph.D. from Princeton, Dr. D. N. Kramer, Chief of the Kits and Laboratories Branch, who holds a Ph.D. from the University of Maryland; and Paul Cannon, Jr., research chemist and Lincoln Univ. graduate.

QM Report Covers Study Of Malnutrition Ecology

An Army program to survey the adequacy of native food diets in the world's underdeveloped regions has been given a promising start with the recent publication of "The Ecology of Malnutrition in the Far & Near East."

The author is Jacques M. May, M.D., Director, Medical Geography Department, American Geographical Society. The work was prepared by the Society under contract with Headquarters Quartermaster Research and Engineering Command, Natick, Mass.

The study is intended to serve as a military planning document for evaluating the potential of foreign food resources for provisioning troops and civilian populations in event of war or during large-scale epidemics.

Countries covered in separate chapter analyses include Mainland China, Formosa, Vietnam, Cambodia, Laos, Thailand, Federation of Malaya, Burma, India, Ceylon, Pakistan, Afghanistan, Iran, Iraq, Saudi Arabia and the Arabian Peninsula, Syria, Lebanon, Israel, Turkey, and Egypt.

Each chapter develops the general theme of food availability through a chain of events, which starts with the land effect (physical geography), considers methods of food production to include the impact of purchasing power (economic geography), evaluates the role played by traditions and traits on dietary habits (human geography), and ends with a discussion of related diseases (medical geography).

Senators Back Creation Of Government Office of Science and Technology

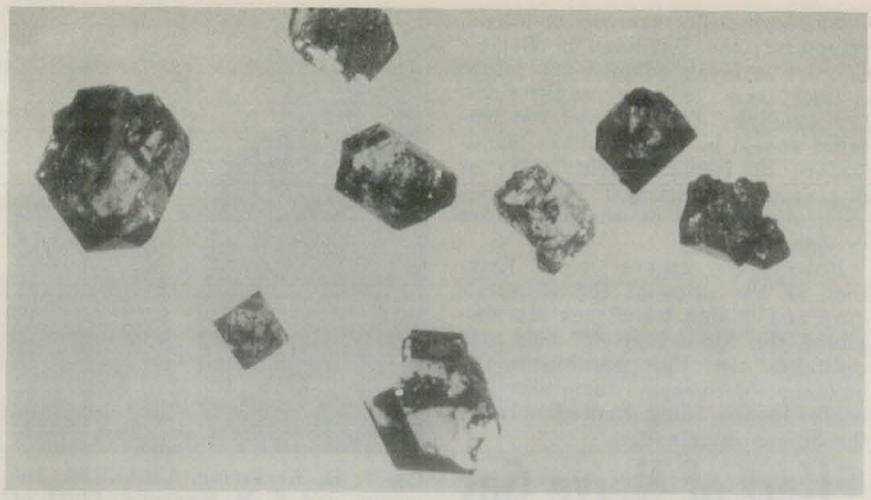
Scheduled for submission to Congress is a proposal to establish an Office of Science and Technology to coordinate and evaluate all Government activities in this field, Washington, D.C., newspapers reported Mar. 20.

Minnesota's senior Senator, Hubert Humphrey, who has been pressing in recent months for broad changes to improve dissemination of scientific information, was quoted as saying that President Kennedy is preparing an order to establish the top level monitoring agency for Government R&D.

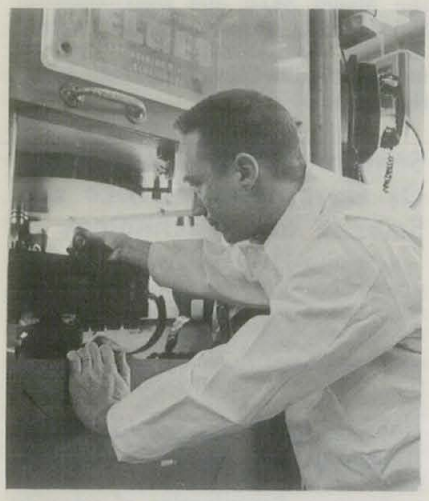
The proposal for the OST, Humphrey indicated, would be incorporated in a Government reorganization plan which would become law unless disapproved within 60 days after submission to Congress.

As explained by Senator Humphrey, the proposal for the OST is expected to follow generally the recommendations of Senator Henry M. Jackson's Subcommittee on National Policy Machinery and Humphrey's Subcommittee of the Government Operations Committee.

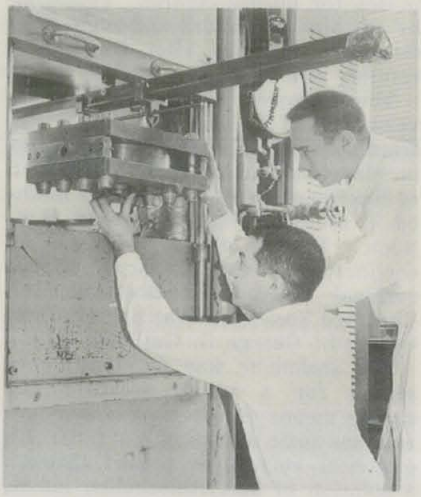
The latter committee was reported as stating that the duties of the director of the OST should include "the job of making sure that the President is never isolated from the full flavor of debate and controversy on important matters in dispute." To serve this purpose, the director would be readily available to Congress for hearings on such issues.



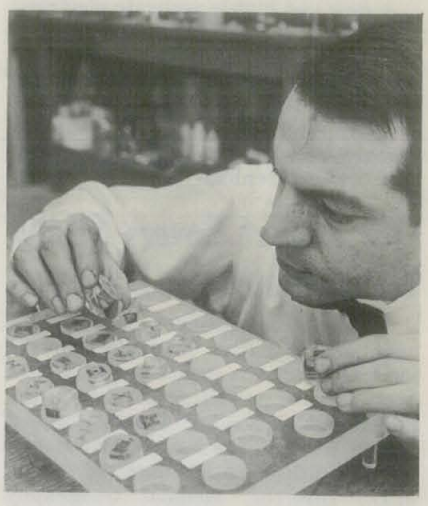
Diamonds in Production



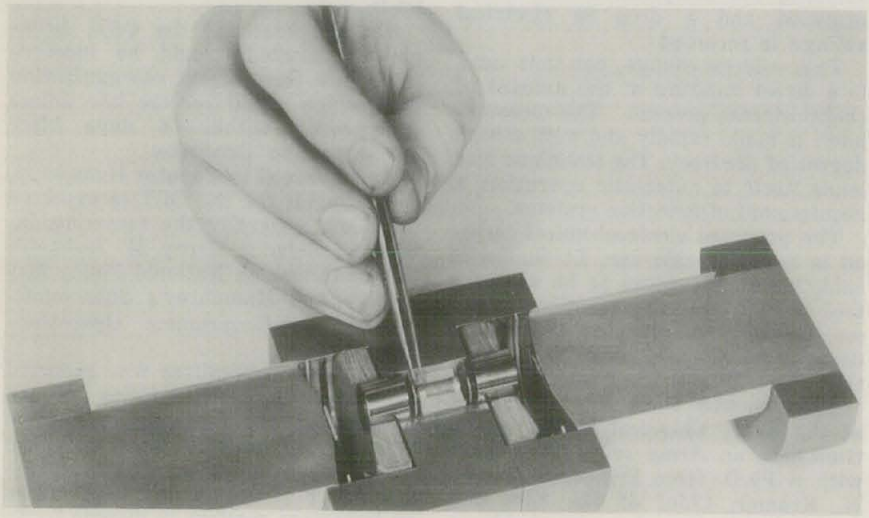
U.S. Army Signal Research and Development Laboratory scientist John Tydings inserts steel piston into press for diamond synthesis experiment.



Dr. Giardini inspects synthetic diamonds. Samples are embedded in plastic for analysis to determine that they meet exacting standards.



Dr. Armando Giardini works on pressure-multplying device as Tydings prepares for operation of the press.



Cross-section of supported stepped piston chamber mechanism in which diamonds are crystallized from graphite (pointed out by tweezers) in molten metal when subjected to very high pressures and temperatures.

Army scientists, in a long-range research program, are duplicating the intense pressures and temperatures existing deep in the earth's crust to create diamonds and other ultra-dense materials for use in electronics.

A major success in this field was achieved in 1959 when the U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J., became the second installation in the country to make diamonds from common graphite.

The diamonds were small (the largest measured one-sixteenth of an inch) and they were quite impure, but this success indicated the future capabilities of a unique pressure-multiplying chamber developed by the Signal Corps.

In the years that followed, a scientific team led by Dr. Armando Giardini and John Tydings created many thousands of diamonds and refined

Synthetic diamonds are checked carefully under microscope to insure that each is free of imperfections that would preclude electronic circuit use.

the methods of synthesis. Now it is possible to make very pure diamonds that are a glittering sight to behold, if only in a microscope. The laboratory, however, is not primarily interested in the tiny diamonds as gems, but rather for promising application as semiconductor circuit elements.

Diamond, which is nature's hardest material, also has a molecular lattice that is well suited for semiconductor action. Natural diamonds ordinarily are not good semiconductors because impurities are uncontrolled, but high-quality synthetic diamonds can readily be made semiconducting by adding measured concentrations of carriers such as boron or nitrogen during or after synthesis.

"Jeweled circuits" probably will not turn up in military equipment for a long time. However, diamond semiconductors could well grow in importance. Tests show they can withstand intense temperatures and power loads that would break down ordinary semiconductor elements.

In addition to diamond, the USAS-RDL high-temperature-high-pressure facility has produced cubic boron nitride (a compound not found in nature, similar in structure and properties to diamond), high-quality graphite crystals, coesite, and new forms of tantalum nitride, manganese carbide and iron carbide. Many of these also are being explored for electronics applications.

In their diamond synthesis, scientists of the laboratory's Institute for Exploratory Research subject graphite, a form of carbon, to pressures of from 750,000 to 1,500,000 pounds per square inch and temperatures ranging from 1,300 to 2,100 degrees C. Numerous experiments, some of which have taken only a few minutes, proved successful. The genuineness of the diamonds were confirmed by X-ray diffraction and other tests.

In setting up the experiment, a graphite sample is placed in the three-sixteenths inch bore of a heat resistant cylinder made of the mineral prophyllite. Thin pellets made of materials that dissolve graphite under heat and pressure are pushed snug into each end of the bore, and high-strength pistons are placed over them.

This assembly is the heart of the Signal Corps-patented "supported stepped piston chamber" which concentrates the pressure generated by a 12-foot hydraulic press onto the tiny sample.

The diamonds form as a decomposition product of a supersaturated solvent-carbon solution and are found at the ends of the graphite sample.

After cooling, the sample is removed from the press, the mineral cylinder is chipped away, most reactants are dissolved off with acid, and the diamonds are separated from remaining residues by selective precipitation in oil.

Reports of man-made diamonds reach back to the 19th century, but scientists today discredit these early claims. Prior to 1959, when the Signal Corps produced its first diamonds, only two other laboratories in the world are known to have succeeded in making diamonds, the General Electric Company in the U.S., and a Swedish firm, A.E.S.A.

Army Aids Students National Science Fair

Army support of the 13th National Science Fair-International, scheduled May 2-5 at Seattle, Wash., scene of the 1962 World's Fair, will follow the pattern established in 1961. Sixteen young scientists selected by a panel of eight Army judges then received week-long all-expenses-paid summer vacation visits to Army laboratories.

The National Science Fair-International is the culmination of a wide-ranging effort sponsored by Science Service, in cooperation with leading scientific organizations throughout the Nation, to select approximately 400 of the outstanding high school science students.

Participants in the National Science Fair-International include students attending sophomore, junior or senior classes of any secondary school, whose exhibits were selected from city-wide, area, or regional fairs held throughout the year.

Finalists, usually one boy and one girl, are sponsored to the Fair-International by a local newspaper, college, or other interested organizations. The 400 finalists this year will represent some 200 city-wide, area, and regional student science fairs, including those held in all 50 States, the District of Columbia, Puerto Rico, Canada, Germany, Japan, Thailand.

Judges selected for this year's Army Panel include: Dr. Paul A. Siple, Scientific Adviser, Army Research Office, OCRD, Chairman of the panel; Dr. Eugene N. Sporn, Chemical Corps R&D Command; Dr. G. G. Quarles, Office, Chief of Engineers; Col George F. Leist, Office, Chief of Ordnance; Dr. J. Fred Oesterling, Quartermaster R&E Command; Mr. Marshall D. Aiken, Office, Chief Signal Officer; Dr. D. Stull, Office of the Surgeon General; and Dr. Robert L. Echols, U.S. Army Transportation Research Command.

In addition to Army, Air Force and Navy awards made at the National Science Fair-International, awards are also conferred by the American Chemical Society, American Dental Association, American Heart Association, American Institute of Biological Sciences and the American Medical Association.

Other professional groups offering awards include the American Pharmaceutical Association, American Veterinary Medical Association, National Aeronautics and Space Administration, National Pest Control Association, Optical Society of America, Pathology-Medical Technology, and American Society for Microbiology.

Science Foundation Supports Summer Teacher Conferences

In support of 25 Summer Conferences for College Teachers of Science, Mathematics and Engineering, the National Science Foundation (NSF) recently announced grants to colleges and universities of over $400,000.

Designed to strengthen teachers' mastery of newer developments in their specific fields and help increase their classroom effectiveness, the conferences are up to four weeks in duration. Each conference will include about 25 teachers.

Included in the program for this summer are specialized topics in biology, chemistry, computer science and programing, engineering, geology, geophysics, mathematics and physics.

DOFL Student Training Program Leads Into R&D Careers

Addition of 65 "recruits" to the professional staff within four years attests to the success of the Science and Engineering Student Training Program at the renowned Diamond Ordnance Fuze Laboratories in Washington, D.C.

Initiated in 1954, the program is satisfying approximately 75 percent of DOFL recruitment requirements for high quality junior scientists and engineers. Nearly 15 percent of the total professional staff consists of former participants in the program.

DOFL success is extraordinary, perhaps, but in no way unique. The Army's continuing effort to enroll top quality science and engineering students in its R&D career development program is reflected in similar programs throughout the Technical Services and affiliated activities.

When the DOFL summer training program was launched, students were employed under excepted-service appointments which did not qualify them for many Civil Service career employee benefits. Now they are enrolled under career conditional appointments. Upon graduation they can qualify for permanent career employee appointments.

Many students enter the DOFL program during their first or second year of college and carry on with their training during summer vacations until they graduate. Some continue to work part-time while continuing studies for advanced degrees.

Based upon results of competitive Federal Civil Service student trainees entrance examinations, applicants are certified on registers. DOFL currently is averaging more than 300 applicants each year, and about 100 are selected.

Starting pay usually is grade GS-3 (slightly over $300 a month) and second-year participants with 2½ years of academic training may advance to GS-4. Upon graduation from college or university they can qualify for permanent Federal Civil Service career appointments, starting at GS-5 or GS-7, depending on qualifications.

DOFL training selectees usually are representative of about 40 leading colleges and universities from all parts of the United States, though more than 50 percent are from educational institutions in the proximity of Washington, D.C. Selectees normally are proportionately representative of DOFL requirements in the scientific disciplines of physics, chemistry, mathematics and engineering.

Qualifying students are assigned to laboratories according to their aptitude interests and career development needs. Assignments usually are challenging, and are varied during succeeding summers to round out the students' work experience as well as to augment their academic courses.

Donald R. Bays, University of Arizona student-trainee, receives Certificate of Special Service to the Government from Maj Norman Durocher, Chief, Meteorology Department, U.S. Army Electronic Proving Ground, Fort Huachuca, Ariz. Bays was cited for his outstanding work in the Cooperative Education Program at USAEPG. Looking on are Dr. Thomas L. Martin, Dean, College of Engineering (left) and Maj Gen Emil Lenzner (USA Ret.), University Director of Engineering Services, and former Commanding General, USAEPG.

A notable advance in the DOFL training program was made in 1960 when, at the suggestion of Harry J. Constantine, then serving as Training Officer, a Student Trainee Technical Symposium was inaugurated. Twenty-one students presented papers on their work. The following year 31 papers were selected as being of sufficiently high standard to merit a 2-day symposium.

Presentations at the symposium, now an annual event because of its outstanding success, are judged by a panel of senior DOFL professional personnel. Small honorariums and DOFL Certificates of Achievement are awarded to the winners, usually by the DOFL Technical Director.

21 R&D Personnel Slated For Promotion to PL-313

Twenty-one new incumbents of Public Law 313 positions recently allocated to the Department of the Army for top-ranking R&D scientific and engineering personnel are expected to be announced this month.

The 87th Congress authorized the Department of Defense to establish 80 additional PL-313 spaces, and 21 of these raised the total of Army positions to 144. Nominations submitted by Chiefs of the Technical Services are being processed by the Manpower and Personnel Division, Office of the Chief of Research and Development.

Names of the men elevated to PL-313 status in the Department of the Army will be carried in a revised list of positions and incumbents expected to be ready late this month.

Chemical Corps Presents Awards to Six Employees

The U.S. Army Chemical Corps Biological Laboratories recently honored six employees for outstanding performance of their duties.

Awards were: Mrs. Alma M. Boyer, Special Services Presentation and $150, in recognition of work at the East Coast Relay Station; Mrs. Sarah L. Durick, Sustained Superior Performance and $100, for work in the Virus and Rickettsia Division; Charles F. Bortgis, Suggestion Award Certificate (SAC) and $395, for work in the Technical Engineering Division; Orville E. Baer, SAC and $360, for work in the Animal Farm Division; Victor R. Mumma, two Final Patent Awards, including $200, for work in the Physical Defense Division; Robert R. Freeman, Final Patent Award, including $100, for work in the Pilot Plant Division.

Deputy CRD Needles Military Writers by Quoting

In a recent memorandum to all division chiefs, Maj Gen Dwight E. Beach, Deputy Chief of Army Research and Development, directed attention to extracts from an article in the *New York Times* headlined "Plea: 'Put It in English'" by Robert Moses. General Beach's notation was "for your information and any action you deem necessary." Excerpts follow:

Those of us who for our sins must live more than half of our business and official lives amid conferences, telephone calls and paper work suffer more and more. . . . Most of the stuff I have to wade through and listen to is illogical, long-winded, pompous, dreary, confusing and inconclusive. Almost any letter or memo could be cut in half and improved in the process.

Edward Everett spoke for two hours at Gettsyburg in his best Harvard manner to great applause—and today nobody cares. A modest, incidental orator said it all to indifferent hearers in the tradition of the Bible and Shakespeare in two hundred and sixty-seven words which go ringing down the corridors of time.

Some of the finest writers have been soldiers.

The worst writers are ——, and the suspicion grows that, in spite of their absorption in exact techniques, the reason is they don't think straight.

Always remember what St. Paul says in I Corinthians: "For if the trumpet give an uncertain sound, who shall prepare himself to the battle? So likewise ye, except ye utter by the tongue words easy to be understood, how shall it be known what is spoken? for ye shall speak into air."

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

KNOWLEDGE IN THE MAKING. According to John Milton in *Aeropagitica:*

"Where there is much desire to learn, there of necessity will be much arguing, much writing, many opinions; for opinion in good men is but knowledge in the making."

On the other hand, according to Lao-Tze:

"The wise man does not speak; the talented man talks; only the stupid argues."

THE WISE MR. SAM RAYBURN. Mr. Rayburn passed away on Nov. 16, 1961. He left many words and deeds for which he will long be remembered. There was one which impressed me as being particularly appropriate for R&D executives, overladen with work and short on aides.

On the eve of the last Presidential Inauguration, several Congressional leaders were asked over the television broadcast as to any advice they would care to proffer the new President. The then Speaker of The House replied that he had already passed on the same counsel he had previously provided the two predecessors. It is to exercise the greatest of all care in the selection of the personal staff immediately around the President.

I wrote Mr. Rayburn about his modern application of an ancient proverb. For it was 3,000 years ago, I believe, that some bird was reputed to have said, "I would rather serve under a vulture as king surrounded by swans, than under a swan surrounded by vultures." Mr. Rayburn was very kind and most gracious in his reply and said he was pleased to learn about it.

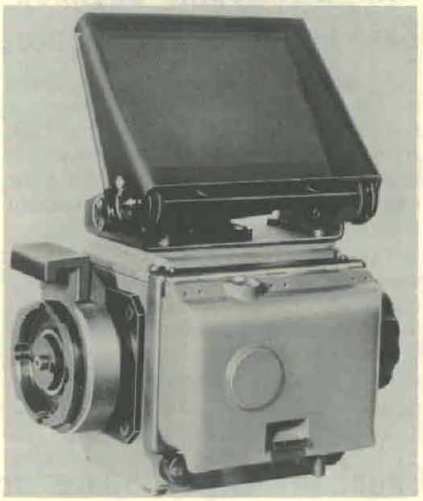
Ordnance Corps Reviews Foreign Weapons Progress

(This is the second of a series of articles on the U.S. Army Ordnance Corps' review of significant developments in foreign weaponry, for possible use or adaptation in common defense. The Italian 105 mm. Mountain Howitzer was reviewed in the February issue.)

The West German Delta Antiaircraft Sight. Production of prime quality optical equipment was a noteworthy source of pride for Germany even prior to her emergence as a modern nation in 1870. The Delta Antiaircraft Sight, a recently developed fire-control device, is evidence that West Germany is continuing this pattern of achievement as a member of the North Atlantic Treaty Organization.

Designed for light and medium antiaircraft artillery, the new Delta sight incorporates rugged, lightweight construction, adaptability to all types of gun mounts, ease of transportation and simplicity of operation and reliability. It facilitates rapid target acquisition by combining a reflector sight of high quality with a wide field of view.

Since it does not require input of range or elevation of flight direction data, the sight is capable of immediate action. The deflection angle corresponding to each type of target run automatically deflects the aiming point. Even high-speed targets are rapidly acquired and engaged as the sight reflector screen furnishes information to the gun layer. The screen is designed for daylight or artificial illumination.



Since target speed may vary during tracking, the sight design permits the gun layer to introduce dispersion along the aiming line to bring shots on target. Rotation of the flight direction graticule plate provides ready corrections in the gunsight for any change of flight direction.

USAERDL Physics Branch Chief Stacks Up Top Ratings

Dr. George H. Hass, an authority on thin film coatings and optics, has received his seventh Outstanding rating for his work as Chief of the Physics Research Laboratory at the U.S. Army Engineers Research and Development Laboratories, Fort Belvoir, Va.

Col J. H. Kerkering, Director, presented him with the award at a recent ceremony. Dr. Hass has received several Sustained Superior Performance awards, along with the Laboratories' Technical Achievement Medal and the Army R&D Achievement Award.

A native of Germany, he has been employed at the Laboratories since 1946, is a Fellow of the Optical Society of America and of the Physical Society, and is listed in American Men of Science.

Artist's Sketch

Army Developing 'Skyhook' Based on Navy Experience

Knowledge gained by the U.S. Navy in pioneering research in air-sea rescue techniques is facilitating U.S. Army development of an air-ground system for retrieving personnel or emergency cargo from small areas in rugged terrain or deep woods.

The Army's AC-1 Caribou fixed-wing aircraft transport is being equipped with a newly developed pick-up system employing a "skyhook" which had its forerunner in the Navy.

Because of the precise and peculiar nature of various Army requirements, however, numerous modifications and refinements of the Navy system have been necessary. The Caribou is fitted with a wide fork constructed of light-weight tubing, a "sky anchor" which locks a nylon line to the nose of the plane, and a compact drop package.

To effect a pick-up, the package is paradropped to a waiting man. He attaches the 500 feet of nylon line to an inflatable balloon which carries it aloft. Then he faces the direction of the rescue plane's approach. The aircraft flies straight and level into the line which locks via the "sky anchor" to the nose-mounted fork. Flashing lights are attached to the line for pick-ups at night.

As the line streams out along the fuselage, the aircrew retrieves it into the plane by use of a special hook. It is attached to a winch and the man (or cargo) is reeled up and into the plane. Elapsed time from the point of contact until the man is pulled into the plane is usually 10 minutes.

Although the airplane travels at speeds of 140 miles or more an hour during the pick-up, a parachute volunteer who tested the system described the shock as "not half as much as my softest parachute jump."

Change of Address Notice

Officers in the Army Research and Development and Atomic Energy Specialists Programs receive the *Newsmagazine* through special distribution arrangements.

Consequently, whenever their mail address changes, prompt notice should be given to insure continuous delivery. Notices of change should be addressed to: Specialists Branch, OAD (XCP), Deputy Chief of Staff for Personnel, Dept. of the Army, Wash. 25, D.C.

Redstone Scientists Build 'Chunk of Outer Space' for Missiles Research

Army scientists at Redstone (Ala.) Arsenal are building a test-tube chunk of outer space to study the reentry of intercontinental ballistic missiles at close range. The 8,000-kilowatt plasma facility is under construction in the Research Laboratory, Army Ordnance Missile Command.

A plasma test chamber, passing high-speed, high-temperature gas jets over models of ballistic missile nose cones, will give missilemen a close-up look at reentry conditions that they can only estimate now.

In this 60-foot chamber, the reentry plunge of ballistic missile nose cones from 300,000 to 150,000 feet can be simulated by the windtunnel effect of the plasma jet.

Officials said the test facility will aid the study of terminal defense against ICBMs and provide knowledge vital to the task that the Army's Nike Zeus antimissile missile system is designed to perform.

Under test conditions, heated plasma gas blows past model ICBMs at speeds in excess of 14,000 miles an hour and up to 18,000 degrees F.

Plasma gas is generated by passing a high-current electric arc through any normal gas. The atoms become excited and heated by the charge and can be influenced by electric and magnetic fields. Hence the name plasma.

Argon and helium are the gases most favored by scientists because of the simplicity of their makeup, but the new test chamber will use nitrogen plasma mixed with common air to simulate more closely actual reentry conditions.

The AOMC plasma jet program started in 1958, and under the guidance of Dr. Thomas Barr and his staff has developed rapidly. They started with a small single-nozzle jet, then developed a 6-cathode plasma generator to increase the diameter of the jet. Currently they are working on a single-arc chamber that uses tungsten electrodes and a water-cooled copper nozzle cleaner than present graphite nozzles.

All plasma facilities now in the laboratory are fixed operating devices, testing for one altitude at a time. The new facility will be able to simulate accurately the plunge of a nose cone from thin upper atmosphere to denser lower layers.

Watching through viewing pods, Army missilemen will be able to gather valuable information on nose cone behavior from a make-believe front row seat in space.

GIMRADA Testing High-Speed Map Reproduction

An electrostatic process experimental printing machine that holds promise of important advantages is being tested by Army Engineers for possible use in its new automated system of map reproduction, distribution, storage and display.

The U.S. Army Engineer Geodesy, Intelligence, and Mapping Research and Development Agency (GIMRADA), Fort Belvoir, Va., is testing a prototype that does away with the conventional paper, ink and printing plates. This is the second electrostatic printer to be tested by GIMRADA. An early feasibility model built by RCA reproduced maps directly from miniature separation transparencies.

The new test model, built by Harris-Intertype Corp., Cleveland, Ohio, is designed to reproduce topographic maps almost instantly from 70 mm. microfilm. Reprinting and storage of maps and the storage of drawings and printing plates will be eliminated if tests lead to production models.

The process projects light through 70 mm. microfilm onto a moving roll of special paper that is made light-sensitive by electrostatic energy. The image created by the light is developed and fixed in the machine. The completed print is produced almost instantly. The model prints in black-and-white or in color and can reproduce type, line-drawings or photographs.

SFC Carl Jennings operates experimental electrostatic printing machine.

Although the machine prints only one color at a time, the paper can be rewound and rerun for printing additional colors. Finished maps are cut off automatically and delivered in the standard military size, 22½ x 30 inches, at the rate of 2,000 an hour. The machine is designed for use in the standard topographic truck van.

Studies and tests of the experimental model are directed toward development of a 5-color electrostatic printing machine.

Dull Gray Chrome Pays Off For Signal Corps Employee

Some of the frontline soldiers of World War II and the United Nations Korean action undoubtedly remember the dull gray chrome that coated the aluminum whip-type antennas on their radio sets, because in more than one case the drabness probably saved lives.

The man responsible is Thomas F. O'Rourke, a foreman of electroplating in the Fabrications Division who has worked 22 years at the U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J. In 1946 the Army gave him a Meritorious Civilian Award and recently he was presented a medal to commemorate the achievement. The special medal did not exist in 1946; it was struck only fairly recently.

The accompanying citation commended Mr. O'Rourke for outstanding performance in devising the method of using the gray chrome to coat the antennas. It said that in reducing the reflective qualities of the antennas from 55 to six percent, he contributed to security and success of military operations.

Top Designers Consider Prosthesis Improvement At Walter Reed Meeting

Improvements in design of prosthetic devices for the upper extremity amputee were discussed by distinguished leaders in this field at a conference in Washington, D.C., Mar. 5-8.

Held at the Walter Reed Army Medical Center, the conference was sponsored by the Committee on Prosthetics Research and Development, National Research Council, National Academy of Sciences.

Participants included representatives from the Army and other Government agencies, educational institutions and industrial firms engaged in manufacturing prosthetic devices.

Host for the meeting was Lt Col John Butchkosky, Director of the U.S. Army Prosthetics Research Laboratory, renowned as one of the leading laboratories in the world in the design and development of upper extremity prostheses.

Dr. Fred Leonard, Scientific Director of the APRL, and Dr. Charles H. Frantz, chairman of the Subcommittee on Prosthetic Practices and a distinguished orthopedic surgeon, presided as cochairmen.

Col Colin V. Vorder Bruegge, Deputy Commander, U.S. Army Medical Research and Development Command, spoke at the opening session.

THE U.S. ARMY SIGNAL CORPS R&D ADVISORY COUNCIL met recently in executive session at the U.S. Army Signal Research and Development Laboratory. Clockwise from lower left are Dr. Craig Crenshaw, Chief Scientist, OCSigO; A. V. Loughren, Vice President, Airborne Instruments Laboratory; Dr. James F. Koehler; Dr. John D. Ryder, Dean of Engineering, Michigan State University; Jesse R. Lien, Director, Electronic Defense Laboratory; Dr. Ernst Weber, President, Polytechnic Institute of Brooklyn; Maj Gen Earle F. Cooke, Deputy Chief Signal Officer; Maj Gen Stuart S. Hoff, OCSigO; Dr. F. E. Terman, Provost, College of Engineering, Stanford University; Paul R. Adams, Director of Research and Advanced Development, ITT Corp.; Dr. Homer Welch, Director of R&D, Military Electronics Division, Motorola, Inc.; Dr. Andrew Longacre, Director, System Defense Laboratory, Syracuse University Research Corp.; Maj Gen H. L. Scofield, OCSigO.

DOFL Researcher Proves Women Simulate Gaming In War as Well as Men

War gaming and simulation is a research and development field that, to most women, might appear attractive to men only.

Still one of the highly respected participants when the American-British-Canadian Ad Hoc Working Group on War Gaming and Simulation convened in London, England, Mar. 19-23, was Mrs. Betty W. Holz, an employee of the U.S. Army's Research Analysis Corp. in Washington.

Widowed in 1955, less than a year after she had joined the staff of the Operations Research Office, forerunner to the Research Analysis Corp. (RAC), Mrs. Holz has advanced steadily in her career as a research analyst. Her current grade is equivalent to GS-15, which puts her in the $14,000 a year salary range.

When queried as to how she became a top U.S. Army representative at Tripartite war gaming and simulation conferences, Mrs. Holz explained: "Whatever you do, don't refer to me as a senior U.S. representative in this field. Mr. Girard [Edward M. Girard, who accompanied her as the other RAC representative at the recent meeting in London] is much more experienced in war gaming and simulation than I am.

"Actually, I consider war gaming somewhat of a misnomer, because our meetings are not solely concerned with battles as such. We also are concerned with logistical and combat support problems. That's where I fit in. Primarily, I'm a mathematician. My job is to help out with some of the figuring on how to get what is needed where and when it is needed. I have done some work in the field of simulation concerned with mobility problems."

Mrs. Betty Holz

Edward M. Girard

Mrs. Holz was graduated with a B.S. degree in mathematics from Columbia College, Columbus, S.C., obtained her M.A. degree at the University of South Carolina in 1949, and in recent years has continued graduate studies at the University of North Carolina and the American University in Washington, D.C.

More indicative of the professional stature Mrs. Holz has achieved than her membership on the Ad Hoc Working Group was her selection to attend the biennial discussions of the American-British-Canadian Army Standardization Program on operations research in London last June.

She is a member of the Operations Research Society of America, the American Mathematical Society, the Society for Industrial and Applied Mathematics, and Phi Beta Kappa.

Asked about her hobbies, Mrs. Holz replied, "I enjoy singing and I'm quite active in the Mount Vernon Place Methodist Sanctuary Choir."

3256th USAR R&D Unit Generates High-Level Support for Progress Report

Seldom in the annals of U.S. Army Reserve Research and Development Units has more enthusiastic and high-level support been given to a dinner meeting than that generated recently by the 3256th Unit, Durham, N.C.

In the same vein of superlatives, whatever measure of hail-hail recognition Director of Army Research Maj Gen W. J. Ely may receive in the future, there is room for reasonable doubt as to whether newspapers will give him more publicity than was accorded his address to the 3256th on Army R&D progress.

North Carolina's Governer Terry Sanford sent Thomas Lambeth to convey his personal greetings to General Ely and to present a plaque making him an "Honorary Tarheel." Numerous North Carolina dignitaries were among the 175 persons who attended the dinner.

The common comment made about the report on R&D progress was that it was "presented in just the right vein to indicate the range and diversity of Army R&D." The General described the Army's Project ADVENT, a $200 million satellite worldwide communication program, and told about the variety of vehicles and aircraft the Army is developing to achieve greater mobility.

Covered by his speech was the progress in microminiaturization, modular electronics, advances in food and clothing, Army missiles and rockets, communications equipment, new products of materials research, advances in chemical and biological warfare, new methods of field surgery and other gains in medicine, and many new, lighter, more mobile and versatile weapons.

General Ely struck a particularly responsive chord, according to Raleigh and Durham, N.C., newspapers, when he called upon the general scientific community to help in the immense research task that confronts the Army and the Nation to maintain scientific supremacy.

"Government can't do it all," he said. "America must look to private enterprise, educational institutions and scientific foundations for help. . . . The solution to many problems depends upon the talents of the public."

Dignitaries attending the dinner included: Dr. L. L. Roy, head of foundations, North Carolina State College; Dr. Donald B. Anderson, Vice President, Consolidated University of North Carolina; L. Y. Ballentine, State Commissioner of Agriculture; Dr. Deryl Hart, President of Duke University; Maj Gen Claude T. Bowers, State Adjutant General; George R. Herbert, President, Research Triangle Institute; Dr. Marcus Hobbs, Dean of Duke University; Dr. A. C. Menius, Dean of the School of the Physical Sciences and Applied Mathematics, N.C. State College; Lt Col B. W. Rushton, Raleigh Subsector Command, U.S. Army; Col G. W. Taylor, Commanding Officer, U.S. Army Research Office—Durham; Col Kenneth M. Brinkhouse, Medical Corps, Commanding Officer of the 3256th Army R&D Unit; Lt Col Allen P. Blade, U.S. Army Research Office—Durham and a member of the 3256th; and Capt H. R. Baumgardner, Army Adviser to the 3256th.

Views on Role of In-House Laboratories Outlined

(Continued from Page 3)

new problems, but it also fails to find them all. We can use consultants to assist us in some of these problems; but we have found, through experience, that our laboratories provide a ready pool of qualified scientists and technicians to assist in the solution of problems on short notice. In addition, these personnel understand the complexity of Government operations, which saves time and is often more important than is appreciated by consultants.

• Another important function performed by our in-house laboratories is that of providing technical briefing teams. New concepts in weapons systems, organizations and tactics, must be presented to many interested agencies within the Army, the Army Staff, and the Department of Defense before proper decisions can be reached. Scientific and technical personnel who understand the potentials of research and who have a full appreciation of our military needs are ideally suited for this job.

• Our in-house laboratories serve a vital role as the repository of certain types of knowledge and in maintaining special skills and equipment on a national basis. These are assets that we, as a Nation, must maintain if they are to be available when needed. Industry, quite rightfully, must concentrate its available resources on the projects at hand, and cannot afford the luxury of performing these services for the Army and other Defense Agencies. When we ask industry for assistance in developing new weapons systems and equipment, the availability of this knowledge, skills and equipment has made the job much easier, and often less expensive.

• The last, and probably most obvious, role of our in-house laboratories is that of assisting in the technical evaluation of performance by our RDT&E contractors. I stated earlier that the bulk of our research and development work was done by contract. Therefore, it is good business to insure that the performance we pay for is obtained.

We cannot tolerate failures or unreliable weapons and equipment when we are dealing with the security and defense of our Nation. I think it is a natural practice in business for a firm to have its own inspectors. Also, in the final analysis, the Army is responsible to the Congress and to the people for the proper accounting of the public funds which have been expended.

In addition, the Army is accountable to the Congress and to the people for a capability to perform the assigned missions in the defense of our Nation. The users must have confidence in the weapons and equipment with which they are provided. To the soldier it means life or death on the battlefield; to the military commander it means success or failure; and to both it contributes to morale, confidence and prestige.

To you, me and other taxpayers, it means that our defense dollars are being spent wisely. As stated previously, in one of the other roles mentioned, this is a service which cannot be performed adequately, or to the satisfaction of all concerned, by contract with a non-Government agency.

In this discussion of the roles of the Army laboratories, I hope that you have gained some appreciation for their requirement, and the manner in which we use them. We believe that an in-house capability pays great dividends in creating and maintaining certain administrative and technical competence. At the same time, I should like to state that there should be a proper balance between our in-house and contract work. We feel that we are near a reasonable balance in this matter. . . .

However, to insure the closest cooperation between these agencies, I think it is important that you, in management, understand the roles that we visualize for our laboratories. With this understanding you can better direct the activities of your organizations in dealing with these laboratories.

I am sure that you are aware of the fact that the Army is initiating certain internal changes to improve the quality of the work being performed in our laboratories. In certain cases we need to modernize our physical plants since many of these facilities were built in World War II.

Second, we hope that the Army can become more competitive with industry in attracting a fair share of young and promising scientists. This will require salary increases and is necessary to insure the future competence of our laboratories. We need only a small number of new scientists, in comparison to the needs of industry; however, we must maintain a reasonable distribution of age and experience in our technical and scientific staffs.

I have been quite frank with you in discussing the role of the Army laboratories and some of our problems relating thereto. I sincerely hope that this discussion will help in obtaining the best working relationships between Army and contractor teams, and facilitate the creation and development of the best weapon systems and equipment for the future.

SCIENTIFIC CALENDAR

9th Military Operations Research Symposium, Fort Monroe, Va., Apr. 24-26.

Polytechnic Institute Brooklyn Symposium on Mathematical Theory of Automata, sponsored by AFOSR, ONR and USASIGC, N.Y.C., Apr. 24-26.

16th Annual Frequency Control Symposium, Atlantic City, N.J., Apr. 25-27.

International Conference on Chemistry, Paris, France, Apr. 25-May 4.

Symposium on the Use of Artificial Satellites for Geodesy, sponsored by COSPAR and International Association of Geodesy, Washington, D.C., Apr. 26-28.

8th Annual Symposium on Instrumental Methods of Analysis, sponsored by the Instrumental Society of America, Charleston, W. Va., Apr. 30-May 2.

1962 Design Engineering Show and Concurrent ASME Conference, Chicago, Apr. 30-May 3.

2nd International Conference & Exhibition on Compressed Air and Hydraulics, London, England, Apr. 30-May 3.

Second International Symposium on Cybernetic Medicine, Amsterdam, Netherlands, May (date undetermined).

Western Joint Computer Conference, sponsored by IRE and AIEE, San Francisco, May 1-3.

Third National Symposium on Human Factors in Electronics, sponsored by IRE, Los Angeles, May 3-4.

International Conference of University Computing Centers, Mexico, D.F.

Fifth Biennial Secondary Recovery Symposium, sponsored by AIME and the Society of Petroleum Engineers, Wichita Falls, Tex., May 7-8.

1962 National Conference of SPSE, sponsored by SPSE and AFCRL, Boston, May 7-11.

Symposium on Radiation Damage in Solids & Reactor Materials, Venice, Italy. May 7-11.

Electronic Components Conference, sponsored by AIEE, IRE, ASQC and the Society for Non-destructive Testing, Washington, D.C., May 8-10.

High Temperature Polymer & Fluid Research Conference, sponsored by AFOSR, Dayton, Ohio, May 8-11.

Operations Research Society of America, 10th Annual Meeting, Washington, D.C., May 9-11.

2nd World Congress of Gastroenterology, sponsored by the World Organization of Gastroenterology, Munich, Germany, May 13-19.

National Aerospace Electronics Conference of the Professional Group on Aerospace & Navigational Electronics, Dayton, Ohio, May 14-16.

Symposium on Thermionic Power Conversion, Colorado Springs, Colo., May 14-16.

International Conference on Large Electric Systems, Paris, France, May 16-26.

Radiation Research Society, Colorado Springs, Colo., May 20-23.

Eighth Aerospace Instrumentation Symposium, sponsored by the Instrument Society of America, Washington, D.C., May 21-23.

Symposium on the Thermodynamics of Materials used in Nuclear Technology, Vienna, Austria, May 21-25.

8th International Congress on Ceramics, Copenhagen, Denmark, May 21-26.

Conference on Self-Organizing Systems, sponsored by Armour Research Foundation and ONR, Chicago, May 22-24.

National Microwave Theory and Techniques Symposium, Boulder, Colo., May 22-24.

16th Annual Power Source Conference, Atlantic City, N.J., May 22-24.

National Conference on Telemetering, sponsored by IRE, AIEE and the Institute of Aeronautical Sciences, Washington, D. C., May 23-25.

Physics & Chemistry of Ceramics, University Park, Pa., May 28-30.

Weather Slows Arctic Supply Train to 276 Miles in 22 Days

Twenty-two days to travel 276 miles is a long time in anyone's modern travel book, but this unusually long trip by caterpillar tractor took place this winter on the Greenland Icecap.

Supply missions of the U.S. Army Polar Research and Development Center (USA PR&DC) from Camp Tuto to Camp Century, an under-snow research installation, are normally a routine operation. At least once a month a train of five to seven low-ground-pressure D-8 and D-9 tractors, each pulling three or four 20-ton sleds, travels from Tuto to Century carrying food, post exchange articles, medical supplies, books and magazines, diesel fuel and general camp supplies.

Such a tractor train is called a heavy swing, and consists of a command wanigan, a mess wanigan and a generator wanigan to provide power, sleeping quarters, mess and water facilities. (A wanigan is an enclosed sled.)

On the 22-day trip—a swing carrying 20 tons of cargo and 60,000 gallons of diesel fuel—things went fine until the train got about 20 miles out on the cap. Then a tractor track frame cracked. Repair was beyond the capability of maintenance personnel and the tractor had to be left on the trail for pick-up on the return trip. Twenty-five miles farther out, at Mile 45, a second tractor had to be abandoned because of engine problems. Repair in the 20 knot winds and 30 below temperatures was virtually impossible.

Near Mile 60 the situation became grim because of a Phase II, an Arctic storm with winds of approximately 35 knots and blowing snow and ice which make seeing conditions nil. One tractor broke a connecting rod and was lost in the storm. Two other tractors became lost for a short time while hunting for it. After a 3-hour search they found the last tractor with its driver, who was sitting out the storm safe and warm in the tractor.

Not only were the tractor breakdowns and storm important elements in slowing down the swing, but the nearly total darkness of the Arctic days made traveling conditions worse. One tractor carried a beacon light to provide a high-powered beam to penetrate the darkness and enable the others to guide on it. Searching for lost tractors in the dark was at best a difficult task. The little daylight lasted for only two or three hours.

The whole trip to Century took 12 days, about three times as long as a normal Century-bound swing would take; 15,000 gallons of diesel fuel were used, whereas on an average trip only 7,000 gallons are used.

The swing stayed at Camp Century for two days before starting the return trip to Camp Tuto. Soon after it began, frozen steering clutches made another tractor inoperable. It couldn't be repaired and had to be towed back. The bitter cold and rough trail conditions had taken their toll. The three operational tractors arrived at Camp Tuto pulling the four broken tractors along with empty sleds and wanigans.

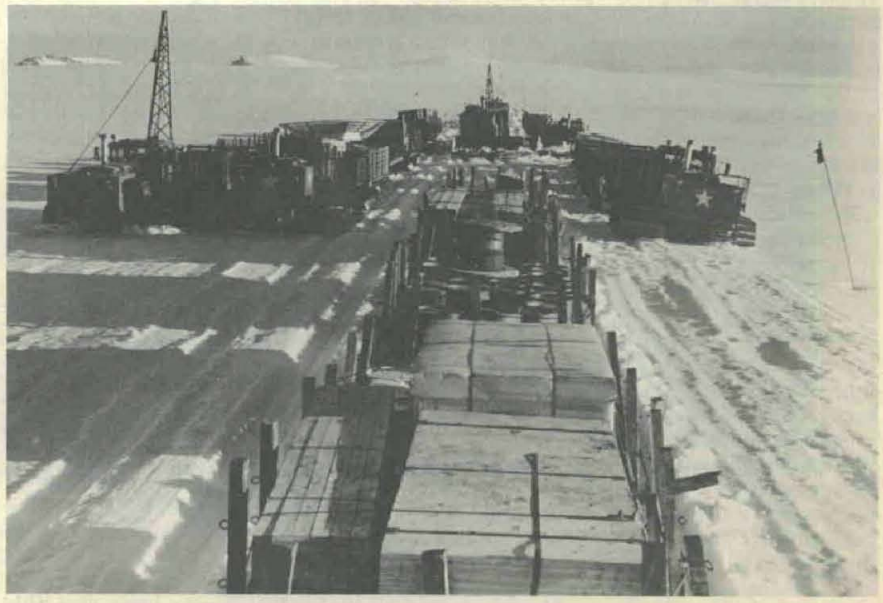
Despite the greater speed on the return trip, several passengers had to be evacuated by PR&DC aircraft—both the UIA Otter and H-34C helicopter — because of Military Air Transport Service (MATS) flight commitments for return to the United States. Included were two British newsmen, who had been at Century gathering material for a news story, and several PR&DC officers.

There were no ration problems; in fact, enough rations for 35 days were carried on the swing. Four meals are served every day on a swing to meet the needs of the around-the-clock work schedule. Tractor operators work on 6-hour shifts and because of their strenuous activity are served 1½ rations at each meal for energy to beat off the vicious Arctic winds.

In spite of the low temperatures during the trip, the swing's neoprene fuel tanks "held up beautifully," according to Capt Joseph D. Pettet, Executive Officer of the PR&DC Equipment, Transportation and Maintenance Co., and a passenger on the swing. Tested for the first time were four new 6,000 gallon collapsible rubber tanks. Neoprene tanks are used to carry fuel to Camp Century for the diesel generator, in case the nuclear power plant, which is the camp's power source, breaks down. One definite advantage in using neoprene tanks is that they hold 6,000 gallons of fuel; metal tanks hold only 2,750.

An unusually long swing such as here described is very trying for operators and passengers. They go through long periods of tension and anxiety as they cross the icecap, seeing nothing but snow ahead and behind for as far as the eye can see. After several days of this routine, it is quite a relief for them to arrive at their destination, whether Tuto or Century, for both offer opportunities for human contact which can't be approached on the trail.

There is a swing somewhere on the Greenland trail at least two weeks out of every month. In their slowness they raise images of the old covered wagons that used to cross the Western plains; and the personnel carry on the pioneer spirit in the Army's very modern program of Arctice research and development.



A heavy swing, carrying food, post exchange articles, medical supplies, books and magazines, diesel fuel, and general supplies, on the trail between Camp Tuto and Camp Century, U.S. Army Polar R&D Center, Greenland Icecap.

Army Pioneers Positioned for Posterity By Antarctic Landmarks Named for Them

Pioneering research of Army scientists in the Antarctic is being traced for posterity in the growing chain of mountain peaks or other geographic landmarks bearing the names of hardy adventurers.

Future Antarctic maps will show Fowler Knoll, Havola Escarpment and Pagano Nunatak, as a result of action taken in mid-March by the Advisory Committee on Antarctic Names. Selected on the same list are 22 men representative of other exploratory or research organizations.

CWO George W. Fowler achieved recognition for numerous Antarctic expeditions in recent years, notably his work during the International Geophysical Year and as a ground navigator and trail blazer with the Havola expedition which completed an historic trek on Jan. 11, 1961.

Maj Antero Havola, also a veteran of many Arctic and Antarctic traverse parties, headed an 11-man Army-Navy team which staked out an 800-mile "safe highway" through a previously untraveled dangerous crevasse area of the Antarctic, stretching from Byrd Station to the U.S. Amundsen-Scott South Pole Station. (See March 1961 issue, page 3.) He was cited by the Army and the Navy.

CWO Gerald Pagano was active as an assistant to Dr. Paul Siple, Scientific Adviser, in programing early polar activities of the U.S. Army Research Office. He was loaned to the Antarctic Project Office as an Army representative and for the past three years has been on the staff of Rear Adm David M. Tyree, Commander of the Navy's Operation Deep Freeze.

Largely as a result of Antarctic explorations which had their inception during the International Geophysical Year, six other Army scientists have had their work recognized by geographical prominences named after them.

Most internationally renowned is Dr. Paul A. Siple, whose Antarctic adventuring dates back to the first Byrd Expedition, 1928-30, which he made as the American Boy Scout selected in a nationwide competition. Mount Siple and the Siple Coast are named in his honor.

Another U.S. Army Research Office explorer widely acclaimed for his work as Scientific Leader at Byrd Station during the IGY, and for his research in migrations and propagation of Antarctic bird life, is Dr. Carl R. Eklund, now Chief of the Polar Branch. His geographical monument consists of Eklund Islands, near the base of the Antarctic Peninsula.

In length of continuous Antarctic residence and research work, the Army's No. 1 man is Lt Col Merle Dawson, U.S. Army Transportation Corps. Dawson distinguished himself as trail boss on numerous major "swings," or traverses, across hazardous crevasse regions. He spent the greater share of five years, 1956-61, on the U.S. Navy's Operation Deep Freeze activities under both Rear Adm George Dufek and Rear Adm Tyree. His permanent memorial is Mount Dawson, towering 14,000 feet at Lat. 77°47′ S., Long. 86°18′ W.

Distinguished scientific service earned the Army Quartermaster Corps' Paul C. Dalyrymple enduring recognition in the form of a 2-mile-high mountain near the South Pole named in his honor. He is credited with initiating the U.S. micrometeorological research program in Antarctica during the IGY, and spent two years compiling knowledge of how heat transfer between the surface and upper air near the South Pole influences weather patterns.

Mount Mogensen is a lasting tribute to Maj Palle Mogensen, U.S. Army Transportation Corps, who performed valuable service with Lt Col Dawson in pioneering the route from Little America Station to Byrd Station through some of the most treacherous crevasse areas in the Antarctic in 1956-57. Mogensen also served as Scientific Leader at the South Pole Station in 1957-58.

The British Board of Geographic Names designated Bader Glacier in the Antarctic Peninsula region in honor of Dr. Henri Bader, recognized as one of the world's most eminent glaciologists. Dr. Bader was at the time Scientific Director of the U.S. Army's Snow, Ice and Permafrost Research Establishment. He is now a consultant to CRREL (Cold Regions Research and Engineering Laboratory), the successor to SIPRE.

Over the years dating back to the first Byrd Expedition, Army scientists have blazed a trail of exploration evidenced by many other geographical names in Antarctica. Mounth Roth memorialized Benjamin Roth, the only Army member of that expedition.

Hilton Inlet at 71°57′ S. and 61°20′ W. is named after Donald C. Hilton, a member of a trail party which made a survey of a portion of the east coast of the Antarctic Peninsula in 1940. Active also in Antarctic IGY activities, Hilton recently joined the staff of the Polar and Arctic Branch of the U.S. Army Research Office.

A review of historical records of many Antarctic expeditions would be necessary to explain the roles of other Army men whose feats are now honored on maps. During the U.S. Antarctic Service Expedition 1939-41, the first U.S. Government supported expedition of recent years, several Army enlisted tracked-vehicle drivers and carpenters wintered over Mount Colombo at Lat. 72°28′ S., Long. 144°44′ W. Mount Colombo is named after M/Sgt Louis P. Colombo, mountain and Polar expert of U.S. Army Mountain Ranger Camp, Dahlonega, Ga., Steele Island at 71°00′ S., 60°40′ W. after Clarence E. Steele, Asman Ridge at 77°10′ S., 144°4′ SW. for Adam Asman, O'Conner Nunatak at 72°24′ S., 143°21′ W. after Raymond O'Conner, Sharbonneau Cape at 70°50′ S., 61°27′ W. after Charley W. Sharbonneau, and Morency Island at 71°92′ S., 61°10′ W. for Anthony J. L. Morency.

Unlocking of the ice-bound secrets of Antarctica is in satisfying measure attributable to keys furnished by Army explorers and researchers. But in the opinion of U.S. Army Research Office polar scientists, many fascinating research possibilities challenge future adventurers.

R&D Directive Outlines Procedures Governing Applications for Foreign Travel

Procedures for submitting requests through or to the Chief of Research and Development for official visits to areas outside the continental United States are prescribed in R&D Directive No. 1-1, dated Feb. 28, 1962 (superseding R&D Directive No. 1-1, Jan. 22, 1962.)

The directive calls for a sufficiently detailed reason for the visit to permit proper evaluation of the trip's necessity; justification for any special authorization requested (e.g., excess baggage allowance, itinerary change, commercial air travel instead of available MATS); justification when more than one person makes the trip.

All requests must be submitted to The Adjutant General at least 45 days in advance of travel date, or, in cases where emergency circumstances preclude this, as much in advance of the date travel is to commence as is necessary to allow for required coordination and proper approval.

Additional instructions applicable to overseas conference travel of military personnel include: submitting requests by summary sheet through CRD to the Chief of Staff; indicating participation by personnel of other DA staff agencies; stating estimated cost of travel; indicating available MATS will be used; and forwarding requests to arrive at OCRD at least 15 duty days prior to date travel is to commence.

QM R&E Command Selects 3 Employees for Awards Recognizing Achievement

Outstanding technical achievement honors were presented to Stanley Fram, Dr. Torsten Hasselstrom and Mrs. Elizabeth M. Pillion at an award ceremony held at the Quartermaster Research and Engineering Command, Natick, Mass.

Selected as one of three Department of the Army nominees for the Arthur S. Flemming Award, Mr. Fram was recognized for leadership in the applications engineering and standardization programs at the QM R&E Command.

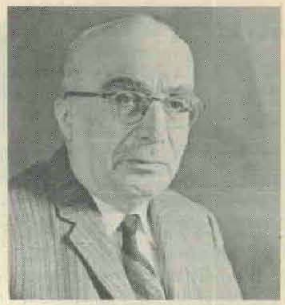
Established in the name of the former member of the U.S. Civil Service Commission and Secretary of Health, Education and Welfare, the Flemming Award is presented annually to 10 Federal employees in scientific, technical, executive and administrative positions.

The Research Directors' Awards, which are the highest honors bestowed annually by the QM R&E Command, were presented to Dr. Hasselstrom and Mrs. Pillion.

As Director of the Organic Chemistry Laboratory, Dr. Hasselstrom worked on difficult problems in food chemistry and organic synthesis to meet QM objectives.

Stanley Fram

Elizabeth M. Pillion



Dr. Hasselstrom

Mrs. Pillion developed a spectrophotometric correction technique for qualitatively identifying ingredients of a dry-type phenolic disinfectant and other multi-purpose mixtures. The procedure was published in *Analytical Chemistry*, the journal of the American Chemical Society.

During the awards ceremony, John H. Driscoll, Charles S. Darst and I. Ruskin Schwartz received lapel pins for completing 30 years of Federal service. Certificates of service were presented to retiring members of the Employee Management Advisory Committee and the Civilian Welfare.

National Guard to Take Over Nike Hercules Posts

Sixteen Nike Hercules missile air defense batteries in five States will be turned over to the Army National Guard during the next 16 months. Guard personnel are being assigned to Army training courses to prepare for their new duties.

The Maryland National Guard is scheduled to be first in the continental U.S. to take over a Hercules battery. Others, in order, will be Ohio, Michigan, New York and California. The Guard already operates six Hercules batteries in Hawaii.

Batteries to be operated by the Maryland Guardsmen are in the Washington-Baltimore air defense sector. Others are in Cleveland, Detroit, New York City, Buffalo-Niagara Falls, Los Angeles and San Francisco.

Guardsmen will man the batteries 24 hours a day, as they have been doing with the Nike Ajax system since 1958.

By 1965, Army Guardsmen are scheduled to be manning Nike Hercules batteries in 16 States, plus the six sites in Hawaii. In addition to the above-mentioned States, these include Connecticut, Illinois, Massachusetts, Missouri, New Jersey, Pennsylvania, Rhode Island, Texas, Virginia, Washington and Wisconsin.

As Guardsmen take on operation of the Hercules batteries, they will phase out of the 76 Nike Ajax batteries they now man except in Missouri and Texas, which will be new to the Guard missile program.

Since Hercules has greater capability than the Ajax, the number of air defense batteries operated by the Guard in the continental U.S. will be reduced. The total number of Guardsmen in missile units will decrease from 8,000 to about 6,000. However, because of increased manning requirements and because the Hercules is bigger and more complex than the Ajax, the number of Guardsmen assigned as full-time technicians to this mission will increase from the present 4,500 to approximately 5,000.

PROMOTION: Edward K. Kaprelian, Deputy Director of Research at the U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J., was congratulated by Col James M. Kimbrough, Jr., Laboratory Commander, upon his promotion to a Public Law 313 position. Mr. Kaprelian is a graduate of Stevens Institute of Technology, studied law and physics at George Washington University, Washington, D.C., is a Fellow of the Society of Photographic Scientists and Engineers, a member of the Physical Society of London, and has received more than 30 patents for inventions.

Army's New Semitrailer Features Hydraulically Operated Gooseneck Coupling

A 25-ton semitrailer, featuring a hydraulically operated, quickly removable gooseneck coupling, is under development by the U.S. Army Corps of Engineers.

The gooseneck permits the trailer bed to be lowered to the ground and, after removal of the gooseneck, to serve as its own ramp for the loading of equipment. The gooseneck is reconnected for pickup.

Towed by a rubber-tired construction type tractor, the semitrailer is designed for both on- and off-road transportation of equipment. It has interchangeable rear-running gear units. One is tandem axle with 16" x 25" tires, to reduce axle load for highway travel. The other is single axle with larger 29.5" x 29" tires, to provide more flotation for off-road transportation.

The semitrailer weighs 31,000 pounds with single axle, or 32,000 pounds with tandem axle. The overall length (semitrailer and tractor) is 58 feet, 2 inches.

Currently undergoing tests, the semitrailer was built by Dorsey Trailers, Inc., Elba, Ala., under a contract with the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va.

Army's Expanding Interest in Materials Research Stressed to Industry, Educators at AROD Parley

The Army's rapidly expanding interest in the field of materials, nonmetallic as well as metallic, was explained at a Materials Research Conference in Raleigh, N.C., Mar. 12-13.

Approximately 200 representatives of educational institutes, industry and the Army took part in the meeting cosponsored by the U.S. Army Research Office, Durham, N.C., and North Carolina State College.

Brig Gen C. W. Clark, guest speaker at the conference banquet, presented a comprehensive review of materials problems on which the Ordnance Corps is at work. Chief of the Research and Development Division, Office of the Chief of Ordnance, and a scientist who obtained his doctorate degree from the University of Leiden, Germany, he stressed the varied environments and rugged conditions under which Army materiel must operate. His talk was effectively illustrated with slide pictures of new materiel incorporating new materials.

Dr. Egon Orowan, Massachusetts Institute of Technology, presented the keynote address on "Bridging the Gap Between Particulate Concepts and Properties of Materials."

Dr. John E. Dorn, University of California, spoke on "Aggregate Structures," Dr. Joseph Marin of Pennsylvania State University on "Continum Properties — Stochastic Concepts," and Dr. Joseph E. Burke, General Electric Co. Research Laboratories, on "Structure and Imperfections."

Scientific presentations were made by: Dr. Lawrence Shifkin, University of North Carolina, "Point Defects in Silver Chloride"; Dr. Alfred Keh, U.S. Steel Corp. Research Laboratories, "Quench Aging and Strain Aging in Iron and Steel"; Dr. R. J. Stokes, Minneapolis-Honeywell Co., "Dislocations and Mechanical Properties in Polycrystalline Ceramics"; Dr. F. D. Knudsen, U.S. Bureau of Standards, "Dependence of Strength and Elastic Properties of Brital Polycrystalline Bodies Upon Gross Microstructure"; and Dr. E. Kroner, University of Stuttgart, Germany, "The Dislocation as a Fundamental New Concept in Continum Mechanics."

Other speakers included Dr. Jack Washburn, University of California; Dr. A. R. C. Westwood, RIAS, Inc.; Dr. H. H. Stadelmaier and S. W. Derbyshire, North Carolina State College; Dr. Charles Vail, Duke University; and Dr. N. A. Weil, Armor Research Foundation.

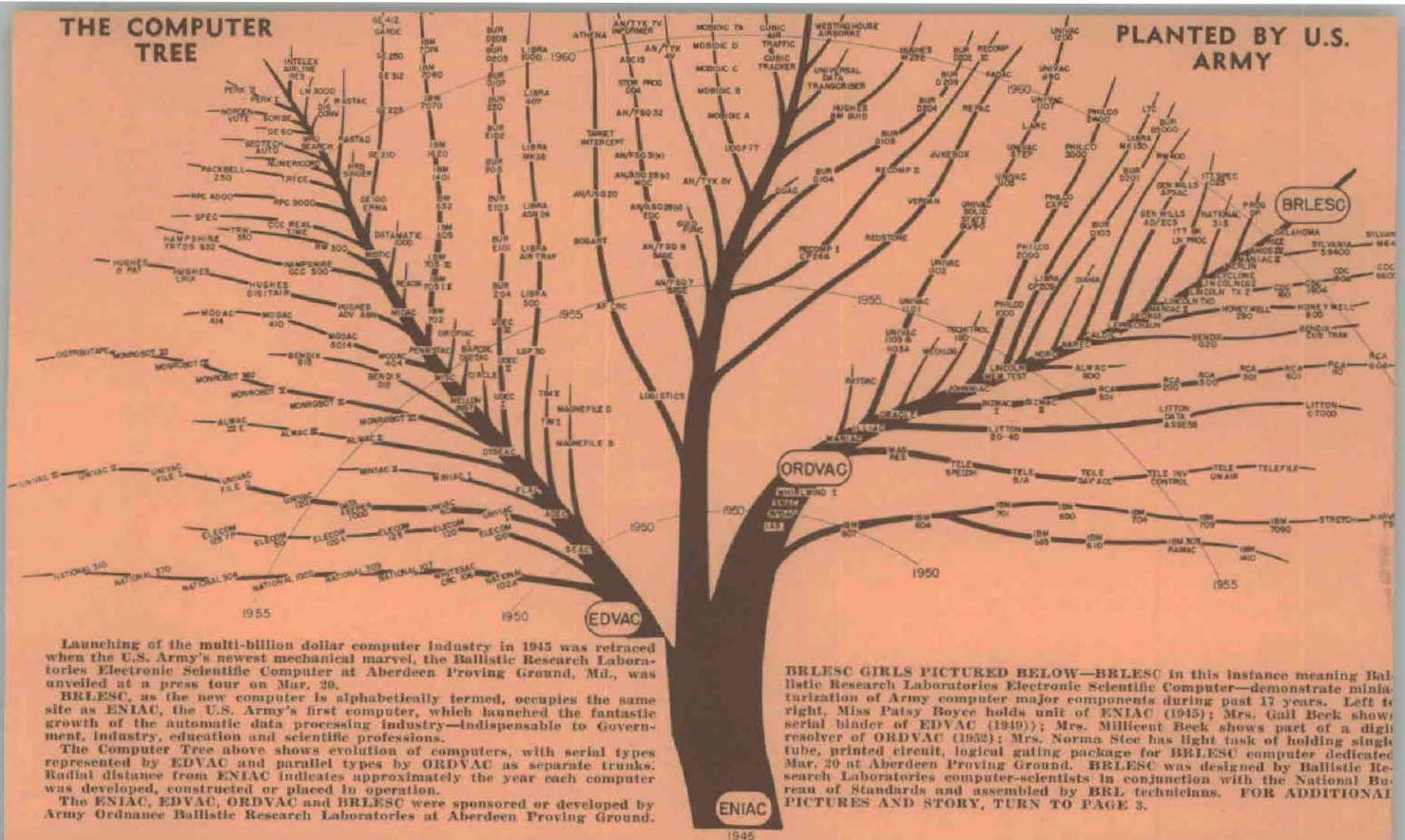
Beach Discusses Benefits Of Army R&D for Civilians In May Magazine Article

An article the *Army Research and Development Newsmagazine* would feel privileged to present to readers will appear in the May issue of the *Army Information Digest*, the official U.S. Army magazine. Permission is being requested to reprint this article.

Authored by Maj Gen Dwight E. Beach, Deputy Chief of Research and Development, Department of the Army, the article is titled "By-Products of Army Research and Development."

The basic theme of the article is that although Army research and development activities, presently representing approximately $1.2 billion of the $43 billion national defense budget, invariably are directed toward production of military materiel, results redound tremendously to peacetime welfare of the civilian population.

The article cites numerous illustrations to show how Army research to meet military objectives has produced breakthroughs in scientific knowledge which have contributed to better medical care, products or techniques which have served agricultural advances, improved materials for industrial purposes, and has in countless other ways helped to raise the American standard of living.



Launching of the multi-billion dollar computer industry in 1945 was retraced when the U.S. Army's newest mechanical marvel, the Ballistic Research Laboratories Electronic Scientific Computer at Aberdeen Proving Ground, Md., was unveiled at a press tour on Mar. 20.

BRLESC, as the new computer is alphabetically termed, occupies the same site as ENIAC, the U.S. Army's first computer, which launched the fantastic growth of the automatic data processing industry—indispensable to Government, industry, education and scientific professions.

The Computer Tree above shows evolution of computers, with serial types represented by EDVAC and parallel types by ORDVAC as separate trunks. Radial distance from ENIAC indicates approximately the year each computer was developed, constructed or placed in operation.

The ENIAC, EDVAC, ORDVAC and BRLESC were sponsored or developed by Army Ordnance Ballistic Research Laboratories at Aberdeen Proving Ground.

BRLESC GIRLS PICTURED BELOW—BRLESC in this instance meaning Ballistic Research Laboratories Electronic Scientific Computer—demonstrate miniaturization of Army computer major components during past 17 years. Left to right, Miss Patsy Boyce holds unit of ENIAC (1945); Mrs. Gail Beck shows serial binder of EDVAC (1949)); Mrs. Millicent Beck shows part of a digit resolver of ORDVAC (1952); Mrs. Norma Stee has light task of holding single tube, printed circuit, logical gating package for BRLESC computer dedicated Mar. 20 at Aberdeen Proving Ground. BRLESC was designed by Ballistic Research Laboratories computer-scientists in conjunction with the National Bureau of Standards and assembled by BRL technicians. FOR ADDITIONAL PICTURES AND STORY, TURN TO PAGE 3.