ARMY RESEARCH AND DEVELOPMENT

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CRD Announces Winners of 22 R&D Achievement Awards

B. M. Horton R. W. Warren Dr. R. E. Bowles

DOFL inventors and developers of fluid amplifier control devices. (For additional winners' pictures see pages 23, 24.)

Inauguration of the Army Research and Development Achievement Awards, to be made annually hereafter in accordance with a plan proposed by the Chief of Research and Development, will be accomplished this month.

Twenty-two awards, involving 27 of the more than 8,000 scientists and engineers employed in Army research and development activities (more than 20,000 throughout the Department of the Army), have been approved. Chiefs of the Technical Services, serving as representatives of Lt Gen Arthur G. Trudeau, Chief of Research and Development, will make the presentations.

Ceremonies are being scheduled at installation level to permit fellow workers of recipients to participate in recognizing and honoring notable scientific achievement. Each winner will receive a bronze wall plaque and a lapel pin, except that group awards will be limited to one plaque.

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Army Lists 10-Year Aircraft Program Goals

Gains achieved to date and projected objectives of a 10-year program to provide frontline troops with better combat area aircraft and at the same time cut costs have been announced by the Department of the Army. Among major changes programmed through 1970 are:

Reduction of the number of helicopter and fixed wing models from 11 to 6.

Conversion from piston to turbine engines.

Standardization of fuels used by all Army aircraft.

Three of the six replacement aircraft are operational, two are in the test flight stage, and one is in the planning stage.

The Army has 5,500 aircraft, of which about 50 percent are helicopters. By 1970, subject to budgetary limitations, foreseeable requirements indicate the Army will have over 8,000 aircraft. Over 75 percent will be helicopters.

The aircraft to be replaced were produced hurriedly under World War II and Korean War pressures in a changing military situation. The announcement said this contributed to the formation of a somewhat makeshift air fleet, requiring objectionable amounts of maintenance and lacking the desired high degree of reliability.

The 10-year program had its origin in a study by the Army Aircraft Requirements Review Board. A confer-

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Theme of the Month

By Lt Gen Leonard D. Heaton
The Surgeon General, U.S. Army

Mosquitoes in the rain forests of Africa and Asia are not normally of great interest to Army field commanders. But a commander who leads U.S. troops into certain tropical areas for a 2-month campaign might be dismayed if 30 to 50 percent of his officers and men became casualties within a few weeks—not from enemy rifles, nuclear weapons or chemical agents, but as a result of mosquitoes bearing malaria and other diseases.

The importance of diseases to military operations is evident in the fact that during World War II, four times as many man-days were lost from diseases as from battle injury. To the commander "man-days lost" means "troops not on the line."

Because communicable diseases can decimate an unprotected fighting force as effectively, completely, and sometimes even more swiftly than an enemy's firepower, studies on appropriate diseases receive top priority in the Army's medical research program.

Among the difficulties encountered is the constant redefinition of our problems with the discovery of new diseases. For example, diseases completely unknown to medical science a few years ago are occurring today in epidemic form in some parts of the world. Other

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

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Theme of the Month

(Continued from page 1)

"obscure" diseases have been found to be widely distributed and far more common than originally suspected.

The ability of U.S. troops to resist infection is influenced by the effect of stressful climatic environments—from frozen wastes of the Arctic to tropical jungles. Also, as we control or eradicate diseases in this country, our soldiers become more susceptible to infectious diseases they may encounter in less developed areas.

Nuclear weapons and their effect upon the soldier's ability to resist diseases, the possible use of biological warfare agents, and the difficulty of maintaining adequate sanitation on the dispersed battlefields of the future, all add to the challenge.

A grim reality in our present-day planning is the fact that many medical problems of World War II and the Korean War still exist. Specific drugs or satisfactory vaccines are not yet available for many diseases of military importance.

Research in preventive medicine includes studies of communicable diseases, immunization, and control of disease-bearing insects and other carriers or reservoirs of diseases. The program takes maximum advantage of the resources of the Armed Forces Epidemiological Board, the Armed Forces Institute of Pathology, overseas Army Medical Service laboratories, and of the faculties of leading universities throughout the country.

The Walter Reed Army Institute of Research in Washington, D.C., is a major center for studies of communicable diseases of military importance. The Institute maintains investigators in several overseas areas, including Bangkok, Thailand, where Army researchers constitute an initial segment of the recently established SEATO Medical Research Laboratory.

Army scientists in three other overseas research units are studying diseases peculiar to the regions in which they are located. In the largest of these units, the U.S. Army Tropical Research Medical Laboratory in Puerto Rico, diseases of the intestines and other organs affected by tropical diseases are investigated. A small laboratory in Panama, affiliated with a larger Public Health Service Laboratory, conducts studies of local fungus diseases. Another small but important research activity is maintained in Kuala Lumpur, Malaya.

The Army Medical Research Unit at Fort Detrick, Md., is working with Chemical Corps investigators in studies on defensive measures against biological warfare agents. In another study, the Army Medical Service is currently field-testing a new pill for the prevention and treatment of malaria—a disease which caused hospitalization of almost 400,000 soldiers in World War II. This combined chloroquine-primaquine tablet appears to provide a simple, safe and effective method of malaria control.

Field tests of a newly developed vaccine to protect against diseases of the upper respiratory passages are very promising, and preliminary reports indicate that this vaccine will greatly reduce the incidence of these diseases, which are particularly prevalent among new recruits.

The value of knowledge gained from research in communicable diseases, like most of the findings of the Army Medical Service research program, is not measured in terms of manpower and lives saved within the military community alone. Achievements in this area are of benefit to all mankind.

Mobile Combat Radar Detects Targets 11 Miles Away

A mobile radar unit that can detect moving targets more than 11 miles away is under development for the United States Army. It will be the Army's first mobile radar set for ground surveillance in combat.

Being developed as a modification of the operational AN/TPS-25 by the Hazeltine Corp. of Little Neck, N.Y., under Signal Corps contract, the unit is capable of travel across land or water and of being dropped by air into strategic combat zones. The radar will be installed in an armored personnel carrier, the M-257, a tracked amphibious vehicle which offers great mobility and protection for surveillance purposes.

The unit will have a 25-foot telescoping antenna mast offering "quick-look" capability and long-range surveillance of moving targets. The radar among other things can distinguish between the walk of a man and a woman up to a mile away. This is possible because a woman's steps normally are shorter and quicker. Its audio ear can determine whether moving targets are men or vehicles.

For mobility, the carrier can attain speeds of up to 40 miles per hour on land and four miles in water.

Army Lists Goals of 10-Year Aircraft Improvement Program

An artist's concept of the "Hummingbird," a research VTOL craft to be designed and constructed under a $1,232,924 Army contract awarded by the Army Transportation Research Command. As envisioned, the aircraft will be able to rise vertically by directing exhaust from two jet engines downward through a system of jet nozzles in the fuselage. Once aloft, diverter valves and the fuselage doors are closed, thus directing the jet flow rearward for conventional forward flight. Lockheed Aircraft Corp. is contractor. A prototype is expected in 1962.

(Continued from page 1)

ence with representatives of the aircraft industry was held in December 1959. Since that time the effort has been a military-industry team affair with the Navy, Air Force, and the National Aeronautics and Space Administration cooperating to assure that the Army has the benefit of the best available military-civilian counsel.

All aircraft to be used by the Army field forces except the AC1 Caribou will be turbine powered. Advantages of the turbines over conventional piston engines, besides operating efficiency, are that they require less maintenance and reduce the time and expense involved in training large numbers of mechanics. Fewer models also mean fewer parts, effecting savings in storage, transportation, and manufacture.

Where present Army combat aircraft require many different grades of fuel, the six replacement aircraft will need only two or three different grades, cutting initial investment and reducing the burden of transportation and storage.

The effect of the "better aircraft for less cost" plan is most apparent at the combat division level. A division now employs six different aircraft, burning three or four different fuels, having few interchangeable parts, and using piston engines requiring a relatively high amount of maintenance.

Under the 10-year program these six aircraft will be replaced with three aircraft all using the same grade of kerosene, and two—the AO1 Mohawk and the HU1 Iroquois—have interchangeable engines.

The six models that will form the nucleus of Army combat aircraft are:

Observation Helicopter—A new 4-place turbine-driven craft will be developed for company, battalion, and combat command level observation, liaison, and emergency evacuation. Scheduled to replace the L19, H13, and H23, the craft will be ordered for manufacture after tests have proved which of several prototypes has the best qualities.

Combat Surveillance Airplane—Powered by twin turboprop engines, the fixed wing AO1 Mohawk is now being delivered to troop units. It replaces the RL23 and RL26. Ruggedly constructed, it can take off and land on short and rough runways, and requires a minimum of maintenance. Equipped with the latest in radar, photographic, and other electronic surveillance equipment, it is designed primarily for target acquisition.

Utility/Tactical Transport Helicopter—Already in quantity production, the HU1 Iroquois replaces the H19, H34, H21, and L20. To be used almost exclusively at the front, its turbo-shaft engine requires only 20 minutes to change. With modifications it can carry up to 11 passengers and will perform numerous functions vital to the infantry unit.

Transport Helicopter — Replacing the H37 and also the H34 and H21, which have dual missions, HC1B Chinook is scheduled to make its first flight soon. The large helicopter has twin turbo-shaft engines, a multi-passenger capability, and can carry a maximum cargo of three-five tons for short distances, depending on available conditions.

Transport—Troops in the field will soon have the new AC1 Caribou STOL transport. Repacing the U1A, the twin-engine craft has a 3-ton cargo or passenger capacity and will be used as a battlefield transport within field Army areas. Known among the troops as the "beans and bullets" carrier, the Caribou can land and take off from unprepared airfields in a few plane lengths.

Utility Transport Airplane—Replacing the L23 and L26, the L23F is modified from a commercial model plane and has been adapted to a wide range of Army uses. While used principally for command liaison mission, the aircraft can easily be converted to carry stretchers or high priority cargo.

Future changes envisaged by the program include a successor to the AO1 Mohawk combat surveillance airplane, possessing greater speed and range. Progress of its development depends on current man-machine studies (See June issue, page 18, "Aviation Board Completes Man-Machine Compatibility Test") and the deve'opment of more sophisticated electronic equipment.

The Army's new transport team, the Chinook helicopter and the Caribou airplane, may be replaced before 1970 by a VTOL craft expected to incorporate all the desirable characteristics of both members of the present team.

How fast the VTOL replacement of Caribou and Chinook comes along will depend on results of the present tri-service VTOL program.

The Army is interested in developing an aircraft to fill the gap that presently exists between the largest Army transport, the Caribou, and the smallest Air Force transport, the C130. It would support frontline troops and have cargo capacity of about 10 tons.

Development of a "flying" crane is another prime objective. In the past progress has been hampered by high development costs and low priority. Recent commercial developments indicate that it may become an "on-the-shelf" item in the foreseeable future.

Army requirements call for a "flying" crane capable of lifting an 8- to 12-ton load and moving it 25 miles. It could be used for rapid, upfront loading and unloading of vessels, emergency transportation of engineer bridges and missile-system equipment, or movement of other heavy equipment over the obstacles of the battlefield.

The Army's current surveillance drone, the SD1, will be replaced by the SD2, a short-endurance drone system, and the SD5, a medium-long-endurance drone system.

Carrying cameras, radar, and infrared devices, the drones will provide an unmanned aircraft supplement to the Mohawk's surveillance duties, supplying target observation at increasing ranges. They are presently in the early test stage.

Aircraft Designation Change

The Army has been changing designation of its aircraft from the Air Force system to one that indicates functions as older Air Force-designated aircraft are phased out and the newer craft become operational.

In the Army system Y means prototype, A means a fixed wing aircraft, H means helicopter, U means utility, O means observation, C means cargo, and SD means surveillance drone. Numbers indicate different models of the prototype, and the last letters refer to the manufacturer.

YAC-1DH, for example, stands for a prototype of a fixed wing cargo aircraft, model number one, built by De Havilland.

Dr. O'Brien Heads ASAP, Other Changes Announced

Dr. Murrough P. O'Brien, Dean Emeritus, College of Engineering, University of California, has been appointed Chairman of the Army Scientific Advisory Panel by Secretary of the Army Elvis J. Stahr, jr.

Appointed to the ASAP as an original member in 1951, Dean O'Brien succeeds Dr. Clifford C. Furnas, Chancellor of the University of Buffalo.

The 59-year-old Chairman has been associated with education and construction engineering since his graduation from the Massachusetts Institute of Technology with a degree of bachelor of science in 1925. He was a research assistant at Purdue University, 1925-27; Freeman Fellow, Royal College of Engineering, Stockholm, Sweden, 1927-28; assistant professor, associate professor, and professor, University of California, 1928-59 (except for temporary assignments to other duties); chairman of the Department of Mechanical Engineering, 1937-43; dean of the College of Engineering, 1943-59; and dean emeritus since.

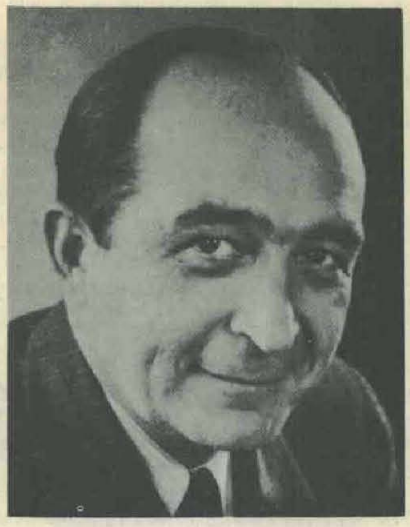
Dr. O'Brien served as a consultant during the Bikini test; director of research and engineering, Air Reduction Co. Inc., 1947-49; and construction engineer, Aircraft Gas Turbine Division, General Electric Co., since 1950. He is a member of the U.S. Beach Erosion Board, the American Society of Civil Engineers, the American Society for Engineering Education, the American Rocket Society, and the Institute of Aeronautical Sciences.

Two members have been added to the ASAP and three members have been taken off the rolls, one by resignation and two through expiration of their terms of appointment.

Dr. Charles B. Hitchcock, Director of the American Geographical Society, N.Y., has been appointed a member by Secretary Stahr. Dr. Hitchcock, a geographer, is an expert on Latin America and will serve on the Environmental Research Subpanel. Richard S. Morse, former Assistant Secretary of the Army for Research and Development, as well as a past Chairman of the ASAP, has rejoined the Panel as a member-at-large.

Dr. Colin M. McLeod, a member of the Environmental Research Subpanel, has resigned, explaining to Secretary Stahr that he was unable to give sufficient time to his panel activities.

The terms of Dr. Lester M. Goldsmith and Michael Gluhareff expired. Secretary Stahr awarded to each a Certificate of Appreciation.



Dr. Murrough P. O'Brien

The following members accepted reappointment to the Panel: Dr. Donald G. Kink, Willis M. Hawkins, Dr. Andrew Longacre, Dr. Daniel E. Noble, Dr. Walter J. Nungester, Dr. Joseph M. Pettit, Eugene L. Vidal, Dr. Ernst Weber, Dr. Ira L. Baldwin, Dr. William L. Everitt, Dr. Alvin C. Graves, and Dr. Ernest J. McCormick.

Redstone Arsenal Plans $5 Million R&D Facility

Details of a proposed new Army facility at Redstone Arsenal expected to cost more than $5 million have been revealed by Maj Gen August Schomburg, commander of the Army Ordnance Missile Command.

General Schomburg said the research and development facility would replace partially some of the facilities of the Army Ballistic Missile Agency transferred to the Marshall Space Flight Center last year.

The facility, subject to Congressional approval, would contain approximately 187,300 square feet of working space and would be projected for completion in 1963. Tentative plans provide for a 3-story concrete structure with two wings.

General Schomburg estimated that his Command would be working with $1.4 billion in the 1962 fiscal year. "We expect approximately $108 million of this to stay right here in Alabama," he said, "because that much will probably be used for in-house effort at Redstone."

Army, Air Force Hailed On JUPITER Teamwork

Cooperation between the Army and the Air Force received high praise from Col Benjamin H. Shiffrin, Chief of Plans and Management for the Air Force Materiel Area, Mobile, Ala., at a recent graduation ceremony at the Army Ordnance Guided Missile School, Redstone Arsenal, Ala.

Col Shiffrin declared that deployment of the JUPITER missile to the North Atlantic Treaty Organization forces "represents the finest example of interservice cooperation yet documented."

Addressing 54 officers and airmen of the Strategic Air Command being trained at the Army school to aid NATO forces at JUPITER bases overseas, the Air Force officer said: "If there ever was a potential for interservice problems, the JUPITER program is a standout. Yet to this day, nothing but harmony and effective working relations have existed."

The 1,500-mile JUPITER was developed by the Army at Redstone Arsenal and assigned to the operational control of the Air Force in 1957. The AOGM School was selected to train Air Force JUPITER units. More than 2,000 Air Force students will have been trained by the Army at the program's end in late 1963.

Since 1952, the AOGM School has grown from a "little Redstone schoolhouse" to a $65 million institution including more than 100 buildings spread over 3,000 acres. It has trained more than 20,000 officers and enlisted men from the Army, Navy, Air Force and Marines, and 1,393 missilemen from other countries.

The school has a faculty of 600 professors and instructors. Its classrooms range from modern laboratories to a huge outdoor JUPITER missile training center.

Film Shows 1960 Major Gains Of Army Signal Laboratories

A half-hour film covering major advances of the U.S. Army Signal Research and Development Laboratories, Fort Monmouth, N.J., during the past year, is now available for showing to military and civilian audiences.

One of the highlights of the film, which is the second in an annual series, is a sequence of pictures sent down by TIROS-I which shows the earth moving under the satellite.

The 16 mm. color film, narrated in nontechnical language, will be available from Army Film Exchanges as OCSigO report MF-11-9364.

Science Foundation Cites AOMC for Advancement

The International Science Foundation has commended the Army Ordnance Missile Command at Redstone Arsenal for advancement of science.

Robert Champion, Executive Director of the Science Foundation, presented the award recently to Robert F. Mello, AOMC Director of civilian personnel, in recognition of the Command's role as one of the principal sponsors of the Science Foundation's "Brainpower Forum" conference held annually since 1956 at the U.S. Naval Postgraduate School in Monterey, Calif.

The citation said in part:

"Whereas the Army Ordnance Missile Command has provided such internationally prominent personages as Maj Gen August Schomburg, Maj Gen John A. Barclay, Dr. Wernher von Braun, Dr. Ernst Stuhlinger and Robert F. Mello as speakers for these conferences; and

"Whereas, the Army Ordnance Missile Command has in many other ways supported the program of the International Science Foundation; be it hereby

"Resolved that the U.S. Army Ordnance Missile Command be given this recognition and commendation for its participation in the program of the International Science Foundation."

Signal Supply Agency Meets With Small Business Firms

In keeping with President Kennedy's request that Government agencies award a larger share of their procurement contracts to small businesses, the U.S. Army Signal Supply Agency, Philadelphia, has held a series of indoctrination conferences for representatives of small business firms.

Subjects discussed at the conferences included: procedures for soliciting bids and awarding production and research and development contracts; the achieving of reliable production schedules by applying the Agency's quality assurance methods; the obtaining and development of specifications and technical publications; and various other aspects of procurement contracting and contract administration.

Representatives of small business firms in 17 Eastern States were invited to attend an indoctrination conference in Philadelphia June 28. Similar meetings were scheduled in mid-July at Pasadena, Calif., and Chicago.

The Department of Defense recently announced that small business representatives will receive advance information on future procurements.

Secretary Stahr Decorates Dr. Witting, Resigned Aide

Dr. Edward G. Witting, who resigned in mid-July as Deputy Assistant Secretary of the Army (Research and Development), received before his departure the Exceptional Civilian Service Award from Secretary of the Army Elvis J. Stahr, jr.

His citation:

"For exceptional civilian service to the United States Army for more than 21 years. His superior knowledge, outstanding organizational ability, and keen foresight, coupled with his understanding of research and development matters, have enabled him to make exceptional contributions to the Army's program.

"In addition, his highly efficient and tactful manner when dealing with representatives of other Government agencies and industry has contributed substantially to increasing the Army's capabilities with the attendant enhancement of the Nation's defense posture. His dedication to duty and unstinting loyalty have commanded the respect of everyone with whom he has come in contact and have reflected great credit upon himself and the Department of the Army."

Dr. Witting received his Ph.D. degree in physics from Johns Hopkins University in 1935. He began Government service in 1940 with the Army Signal Corps, working on development of underwater sound equipment and other acoustic devices. He entered military service in 1942 and served as Executive Officer of the Squier Signal Laboratory and later as Army liaison officer to the Naval Research Laboratory.

After his military service he became chief of the engineering staff and later Director of the Physical Sciences Division of the Signal Corps Engineering Laboratories, Fort Monmouth, N.J. He served as Chief Scientist of the Signal Corps before being named Army Deputy Director of Research and Development in June 1956.

Dr. Edward G. Witting, Deputy Assistant Secretary of the Army for Research and Development, receives an Exceptional Civilian Service Medal from Secretary of the Army Elvis J. Stahr, jr. and General George H. Decker, Army Chief of Staff. Mrs. Witting and their daughter Joyce attended ceremony.

Steering Committee Reviews Operations Research Studies

The Army Operations Research Steering Committee reviewed 50 contract operations research studies at its recent fifth semiannual meeting at the Pentagon, Washington, D.C.

Charged with the review of all Army contract operations research effort, the committee makes recommendations to the Chief of Research and Development.

A recommendation drawn at the meeting was that all contract operations research studies in one particular field be presented in a group, regardless of the Army agency sponsoring the study.

Maj Gen W. J. Ely, Director of Army Research, is chairman of the committee which consists of Army General Staff and USCONARC representatives. Other members are Col A. B. Sundin, USCONARC; Col C. B. Hazeltine, Jr., and G. H. McClurg, ARO, Office of the Chief of Rerearch and Development; Col J. J. Kiely, Jr., ODCSLOG; Col K. A. Ward, OACSI; Lt Col D. R. McNaught, ODCSPER; and Lt Col D. A. York, ODCSOPS.

NSF Forecasts Nation's Needs for Science Program Gains

American investment from all sources for science and engineering education and for basic research must increase from $3 billion in fiscal year 1961 to $8.2 billion in fiscal 1970 to fulfill the U.S. scientific potential.

This conclusion is contained in *Investing in Scientific Progress*, a 10-year forecast of the Nation's science needs published as a major policy document by the National Science Foundation.

Continued healthy growth in numbers of well-trained scientists and engineers is vital, the report states, to enable the United States to satisfy the demands of modern technological society and to maintain a strong position in the world.

Issued "in accordance with the Foundation's responsibilities for national science policy," *Investing in Science Progress*, the NSF said, bears a close relationship to the President's Science Advisory Committee recommendations of last November, *Scientific Progress, the Universities, and the Federal Government.*

"Scientific talent is a scarce resource that the United States must develop to secure its future well being," the report states. It adds that steadily increasing numbers of talented young people want to become scientists, and that if this trend is maintained the United States will have twice as many scientists in 1970 as at present.

Summarizing, the report says that national investment in science and engineering must increase:

- From 100,000 (1961) to 175,000 (1970) in professional staff at colleges and universities.
- From $800 million (1961) to $2,100 million (1970) in staff salaries.
- From $150 million (1961) to $350 million)1970) in facilities.
- From a total expenditure of $2.1 million (1961) for science and engineering education to a total expenditure of $5.5 billion (1970).

In addition, the national investment in basic research in colleges and universities during those years must increase:

- From 45,000 (1961) to 85,000 (1970) in professional research scientists, and from $345 million to $970 million in salaries.
- From $85 million (1961) to $360 million (1970) in facilities for this staff.
- From a total expenditure of $.9 billion (1961) for basic research to an expenditure of $2.7 billion (1970).

McMorrow Awarded 2nd Star, Named AOMC Deputy

Maj Gen Francis J. McMorrow became Deputy Commanding General of the Army Ordnance Missile Command (AOMC), Redstone Arsenal, Ala., effective July 17, following closely his promotion to 2-star rank.

The 51-year-old leader was Director of Procurement, Office of the Deputy Chief of Staff for Logistics, Washington, D.C., from May 1959 until he took over from Maj Gen John A. Barclay, recently retired, as Deputy Chief of Army missile programs.

Graduated from the U.S. Military Academy at West Point in 1933, General Barclay has served as Assistant Chief of Ordnance and as Chief of the Ordnance Training Command, Aberdeen Proving Ground, Md.; as G-4, Headquarters, U.S. Army in Europe; and as an industrial engineering officer at Springfield Armory in Massachusetts.

During World War II he was the Ordnance Staff Officer with the Army Air Force Materiel Command, Chief of the Ordnance Special Staff Section at Headquarters, Far East Air Forces, and had other Pacific assignments.

General Barclay holds a master of science degree in engineering from Massachusetts Institute of Technology and is a graduate of the Ordnance School as well as the National War College. His son Thomas is also a West Point graduate.

Maj Gen Francis J. McMorrow

GIMRADA Spends $428,825 on Map Automation Contracts

Design and fabrication of an automatic point marking, measuring and recording instrument for use in military photomapping has been ordered by the Geodesy, Intelligence and Mapping Research and Development Agency, Fort Belvoir, Va.

A contract award for $349,045 to the Link Division, General Precision, Inc., calls for an instrument that can locate accurately identical photo image points on overlap areas of exposure, physically mark these points, and record their position with respect to an instrumental coordinate system. The test model is scheduled for delivery within 13 months.

Another GIMRADA contract awarded to International Business Machine Corp., in the amount of $79,780, provides for research on photographic mapping detail and data encoding. Work is to be completed in 16 months.

R&D Laboratory Chiefs Meet On Internal Management Task

Representatives of the Technical Services held a Research and Development Laboratory Chiefs Management Conference at the Army Engineer Research and Development Laboratories, Fort Belvoir, Va., July 25-26.

Held in lieu of the biannual conference of Army Key Scientists, it was the first of two meetings scheduled by the Chief of Research and Development to enable R&D laboratory chiefs to discuss internal management problems. The second conference will be held in FY 1963.

Dr. Myron L. Koenig, Associate Dean, School of Foreign Affairs, State Department, spoke on "Understanding the United States as a World Power." W. R. Hinman, Technical Director, Diamond Ordnance Fuze Laboratories, discussed the "Assessment of R&D from the Standpoint of Organization." Dr. James Mosel, of George Washington University, Washington, D.C., gave his views on "Motivation."

Discussion groups considered planning and programming, operations, personnel, administration, and results.

$2,588,133 Order Placed For SERGEANT Trainers

The Army has awarded a $2,588,133 contract to produce training devices for the SERGEANT ballistic missile system.

SERGEANT is being developed under the technical supervision of the U.S. Army Ballistic Missile Agency, an element of the Army Ordnance Missile Command, Redstone Arsenal.

The Philadelphia Ordnance District awarded the contract to Aircraft Armament, Inc. The Sperry Utah Co., Salt Lake City, is prime contractor.

Col Gilbert P. Dubia, Director of the U.S. Army Ordnance Corps Development and Proof Services, Aberdeen Proving Ground, Md., examines the Army's new 40 mm. grenade launcher. This weapon gives the U.S. soldier the ability to destroy enemy machinegun nests, bunkers and small troop concentrations at ranges up to a quarter of a mile with a 6-ounce projectile. Behind Col Dubia is the aluminum-armored, amphibious, air-transportable, self-propelled 155 mm. howitzer, one of the latest members of the Army's new and growing family of powerful, lightweight, extremely mobile weapons, development of which he aided.

Aberdeen Weapons Expert Assigned to Washington

An Army Ordnance Corps officer, whose sole desire is to make the results of his daily work obsolete, left Aberdeen Proving Ground, Md., in July for a key assignment in Washington, D.C.

Col Gilbert P. Dubia, Director of the Army Ordnance Corps Development and Proof Services at Aberdeen since 1957, was selected by Chief of Ordnance Lt Gen John H. Hinrichs for assignment in the Industrial Division of the Office of the Chief of Ordnance.

An expert with every "shooting iron" in the Army's arsenal, from .22 caliber pistols and rifles to the giant 280 mm. atomic cannon, for which he was the project coordinator, Col Dubia has stated that his professional aim is to help "provide one all-purpose weapon to replace all existing weapons—and then look forward to the time when this weapon will become obsolete for all time."

A native of Springfield, Mass., Col Dubia has spent most of his Army career—he came on active duty early in World War II—working on the "weapons of tomorrow," many of which are now in the hands of troops.

As Director of Development and Proof Services, Col Dubia has headed a staff of gunners and engineers, scientists and vehicle drivers, photographers and ammunition experts, soldiers and civilians, who, working as a team, have ripped, torn and literally tortured weapons and vehicles, on test courses and gunnery ranges. Their purpose: To insure that when an American soldier received a weapon with the "D&PS" stamp of approval, he had a piece of equipment that would roll, crawl, shoot or do whatever it was supposed to do far better than its original designer expected.

PAD Symposium Attracts Top Army, Civilian Experts

More than 50 leading experts on propellant-actuated devices from the Armed Forces and civilian agencies, including the National Aeronautics and Space Administration, attended the 3-day PAD symposium held recently at Frankford Arsenal, Philadelphia, Pa.

A feature of the meeting was a showing of the MERCURY space capsule which carried the chimpanzee "Ham" to a height of 155 miles and return. Four propellant actuated devices designed and developed by Frankford Arsenal sustained exposure to flight atmospheric conditions, remaining in perfect condition, examination showed.

Devices used on the MERCURY flight are known as miniature initiators—reserve power packages, designed to function in the event of failure of electrical systems. Systems backed up by initiators include the capsule rocket escape tower, which lifts the capsule up and away from the booster in an emergency, the main disconnect between the capsule and its booster, and the main reserve parachutes.

Originally developed for aircraft pilot ejection systems, the initiator was redesigned to meet requirements set up by NASA. Weighing about one-third of a pound, five inches long and one and one-eighth of an inch in diameter, the device is made of high quality steel. Initiators set in motion life-saving functions at high speed.

ERDL Director Presents Papers

Dr. George W. Howard, Technical Director of the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va., presented two papers at the seminar on R&D Management Development held recently at Pennsylvania State University. Subjects were "Motivation of Scientists and Engineers" and "Building an Effective Organization at the Technical Level."

WES Building Laboratory to Measure A-Blast Effects

Construction of the first laboratory of its kind in the United States has been started at the Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Described as a dynamic load generator, the $1.5 million facility will permit testing structures and structural components under dynamic loads simulating the blast forces produced by full-scale nuclear explosives.

"This facility will enable engineers to get certain needed knowledge, now banned by the nuclear moratorium, and at the same time there will be no explosion, no fallout, no radiation or such dangers involved," said Col Edmund H. Lang, Director of the Waterways Experiment Station.

The three principal "killing" effects of a nuclear explosion are heat, blast (air pressure), and radiation. Only blast effects will be tested by the dynamic load generator which will reproduce air pressure of up to 500 pounds per square inch. Pressure will be created by fast-burning chemicals, fully controlled for test objectives.

SC Expands Communications Capability

Improved combat communications, a continuing high-priority Army R&D objective, are incorporated in three new long-range, mobile air-transportable, emergency systems delivered recently to the Signal Corps.

One of the units, the AN/TSC-18, is considered by Signal Corps experts to be the world's most powerful transportable communications equipment.

Movable by existing aircraft, the units have ranges of 2,500, 5,000, and 7,000 miles, respectively. Any unit can be installed in less than four hours, as compared with the months required for installation of fixed stations with the same power.

Capable of communicating directly with the Pentagon, the systems can bypass fixed Army communications system stations which may be inoperative. They can also tie in with bases placed in isolated areas or areas where normal communications have been disrupted, as occurred in the Chilean earthquake.

The AN/TSC-18, with a 7,000-mile range, provides simultaneous transmission and reception on three telephone and 16 teletype channels. Three units ordered by the Army cost $403,000 each. A unit can be airlifted in three C-124 aircraft.

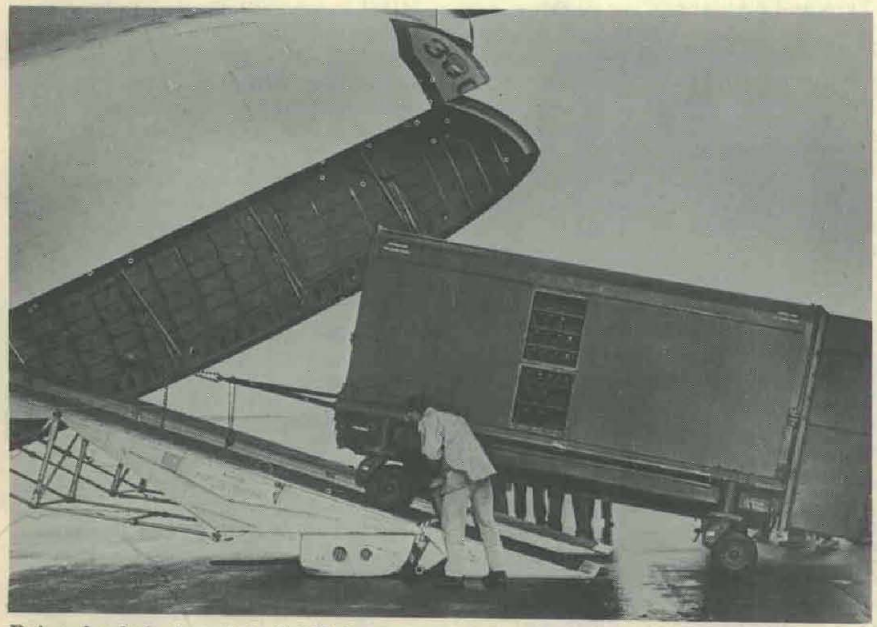
The AN/TSC-19 can operate on three telephone and 16 teletype channels for a distance of 5,000 miles. One unit was ordered at a cost of $375,000. It can be carried in two C-124 aircraft.

The AN/TSC-20 has one voice and four teletype channels and can operate up to 2,500 miles. Ten units will cost $120,000 each. A unit can be airlifted by C-119 aircraft or helicopter.

All three systems have a facsimile capability enabling them to transmit photographs. While the systems can use the same equipment as the fixed communications stations operated by the Army, a 90-day spare parts supply was provided with each system.

Adler Electronics, Inc., New Rochelle, N.Y., developed the systems working with the Signal Corps on a contract basis.

The AN/TSC-20, self-contained in a single van, and light enough to be carried by helicopter to ordinarily inaccessible areas, has a 2,500-mile range.



Being loaded aboard a C-124 is a unit of the AN/TSC-18, most powerful of three new Army communications systems. It has a 7,000-mile range.

HumRRO Picks Advisor To Work With CONARC

In a move to aid the U.S. Continental Army Command on Human Resources Research Office training recommendations adopted by the Department of the Army, Dr. W. L. Williams, Jr., has been appointed advisor for technical advisory services.

Dr. Meredith P. Crawford, Director of the Human Resources Research Office (HumRRO), George Washington University, Washington, D.C., announced the appointment. Dr. Williams will work with the Research Branch, Training Division, Office of the Deputy Chief of Staff for Operations, Plans and Training, Headquarters USCONARC, Fort Monroe, Va.

Prior to his new assignment, Dr. Williams, 34, was Executive Officer of the Air Defense Human Research Unit, Fort Bliss, Tex. In charge of research on proficiency of NIKE missile fire control system mechanics, and anticipating training requirements for future weapons systems, he joined the unit shortly after receiving his Ph.D. degree in 1955 from the University of Tennessee.

From a central office on the University campus in Washington, D.C., HumRRO works with USCONARC in directing activities of five research groups located on Army posts across the Nation.

HumRRO plans and monitors research at the United States Army Armor Human Research Unit, Fort Knox, Ky.; Leadership Human Research Unit, Presidio of Monterey, Calif.; Infantry Human Research Unit, Fort Benning, Ga.; Air Defense Human Research Unit, Fort Bliss, Tex.; and the Aviation Research Unit, Fort Rucker, Ala.

Each of these HumRRO field units includes civilian psychologists and a complement of Army personnel. The military chief reports to the Commanding General, USCONARC, General Herbert B. Powell. The civilian director of each unit is responsible to the Director of HumRRO.

HumRRO observed its tenth anniversary on July 31 as an agency of George Washington University which operates under a contract with the Department of the Army in the conduct of research on training, motivation, leadership, and man-weapons system analysis.

Alaskan OCRD Established

Lt Gen Arthur G. Trudeau, Chief of Research and Development, has directed that an OCRD Alaskan Coordinating Office be established at Fort Wainwright, Alaska, by Sept. 1. It will coordinate all RDT&E activities in Alaska.

Dr. Reese, 37, Assumes Key Post on ZEUS Work

Dr. Bruce A. Reese, one of the Nation's research leaders in jet propulsion at the age of 37, has joined the Army's top priority NIKE ZEUS Project as Deputy Chief of the Anti-Missile-Missile and Space Defense Projects Office.

Brig Gen John G. Zierdt, Commander of the Army Rocket and Guided Missile Agency, announced the appointment of Dr. Reese to enhance the technical and scientific capability available in ARGMA for direction of the NIKE ZEUS program.

Now in advanced development, the anti-missile-missile system is designed for defense against intercontinental ballistic missiles.

Dr. Reese for the past 15 years has been with Purdue University as Professor of Mechanical Engineering and Associate Director of the Jet Propulsion Center. He has served in a consultant's capacity to some of the country's leading missile systems engineers, including the Department of Defense's Advanced Research Projects Agency and the U.S. Air Force.

A veteran of naval service in the Pacific during World War II, Dr. Reese is a native of Provo, Utah. He has a B.S. degree from the University of New Mexico and earned his M.S. degree and doctorate at Purdue University.

A member of Sigma Tau, Sigma XI, Phi Kappa Phi, the American Rocket Society and the American Society of Mechanical Engineers, Dr. Reese is married and has three children.

CmlC Mobile Labs Facilitate Nuclear Research

Four air-conditioned mobile laboratories equip the U.S. Army Chemical Corps Nuclear Defense Laboratory with the capability of providing on-the-spot neutron flux data anywhere in the world.

The first of these laboratories rolled through the gate of the Army Chemical Center in 1956 on the way to Eniwetok, the South Pacific island scene of A-bomb tests. Since that time the mobile laboratories have piled up mileage on additional trips to the Pacific and to nuclear testing sites in the continental United States.

Two units were designed and outfitted by Nuclear Defense Laboratory personnel to house counting equipment for neutron threshold detectors, but can be easily adapted to count beta and gamma radioactivity from any type of small source. Each laboratory is designed around six individual counting systems and each contains facilities for data reduction.

Completely automatic counting equipment has been installed in one unit. Working with Baird-Atomic, of Cambridge, Mass., which built and installed the equipment, the NDL helped to develop a system of scintillation counters for alpha, beta, and gamma radiation to give punched-card readout.

Calibrated and tested successfully at the Los Alamos Scientific Laboratories and General Atomics, Inc., the system has resulted in a 65 percent reduction of required manpower. The NDL consequently is able to offer a neutron-measuring service to all Department of Defense agencies and contractors at a nominal fee. Additionally, it is expected that all data will be processed by computer, thus speeding delivery of data to the user.

Another unit is well-equipped for measuring energy of gamma radiation. Three units can operate wherever electricity is available. The fourth unit is a small, self-contained radiochemical and beta-gamma activity counting laboratory. Carrying its own gasoline-powered electrical generating and water pumping systems, it can be set up for operation near a stream, lake or other water source.

With the cessation of weapons tests, the military effects programs of the various services have had to depend on nuclear reactors and accelerators as sources of high-level radiation. Consequently, NDL's mobile laboratories have taken on added importance in the Department of Defense Research and Development Program.

The mobile laboratories have been used successfully in conjunction with Army and Air Force experiments conducted at the Los Alamos Scientific Laboratories, Los Alamos, N. Mex.; Oak Ridge National Laboratories, Oak Ridge, Tenn.; University of California Radiation Laboratory, Livermore, Calif.; General Atomics, Inc., La Jolla, Calif.; and the Lockheed Nuclear Facility, Dawsonville, Ga.

Gas Mask Minimizes Risk for Propellant Handlers

Protection against toxic fumes of propellants for rockets is provided handlers of liquid fuels and oxidizers by a canister-type gas mask adopted by the Department of the Army.

Designed to minimize the hazards of working in air contaminated by minor leakages during rocket fueling and defueling operations, the mask was developed by the Research and Development Laboratories at the U.S. Army Chemical Center, Md.

Prior to its adoption, propellant handlers were required to wear a compressed-air breathing apparatus whose air cylinders had to be recharged after about 30 minutes of use. Now, the compressed-air gear is needed only for the relatively few jobs in confined spaces where oxygen is inadequate.

Standardized by the Army as the M21 Rocket Propellant Gas Mask, it permits personnel to work safely for extended periods in atmospheres containing low concentrations of toxic fumes. For emergency periods, the mask will protect the wearer against high concentrations of red fuming nitric acid, unsymmetrical dimethyl hydrazine, hydrazine and aniline-type propellants used by guided missiles.

WES Scientists' Papers Read At International Symposium

W. J. Turnbull, Chief of the Soil Division, Army Engineers Waterways Experiment Station, Vicksburg, Miss., attended the First International Symposium on Mechanics of Soil Vehicle Systems held recently at the Turin Polytechnico, Turin, Italy.

Three papers by Station personnel on soil testing were presented to the Symposium. One, by Turnbull and D. R. Freitag, dealt with "The Behavior of Sand Under Pneumatic Tires."

A paper by S. J. Knight and A. A. Rula reviewed the results of investigations into the "Measurement and Estimation of the Trafficability of Fine-Grained Soils," and a paper by Knight and M. P. Meyer discussed a "Soil Trafficability Classification Scheme."

Mr. Turnbull termed the conference, attended by about 300 representatives of Free World nations, "very worthwhile."

CmlC R&D Command Program Enlists Wide Industrial Support

By Brig Gen Fred J. Delmore, Commanding General, CmlC R&D Command

The Chemical Corps Research and Development Command has recently completed an experiment to attract industrial R&D interest which should be of considerable interest and have possible application to other Technical Services, as well as other Government agencies.

Early in 1960, the Chemical Corps was faced with the task of greatly expanding its research and development effort on a contract basis. Ordinarily, this would not appear to be a difficult objective to attain. However, when one considers that the Chemical Corps has historically accomplished most of its research and development effort in-house, and consequently had no large backlog of competent contractors upon which to expand its contract base, the difficulties involved become apparent.

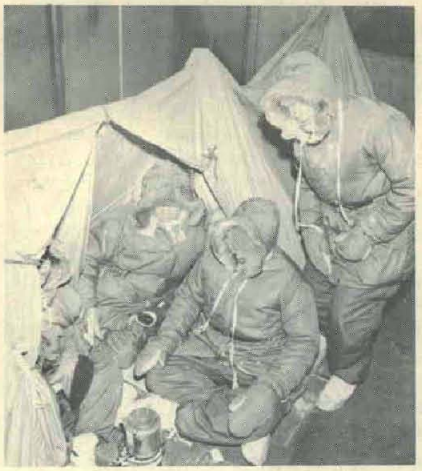
Difficulties were further compounded by the fact that many areas of Chemical Corps research and development were formerly considered quite sensitive or were so specialized that only a very few organizations were aware of their existence.

With the above considerations in mind, it became quite clear that action would have to be taken at once to acquaint American industrial and research institutions with the research and development objectives of the Chemical Corps. In reaching this conclusion, it was fully recognized that industry could offer a maximum contribution to our R&D effort only after achieving a full understanding of our general and specific problem areas.

As a first step to achieve this objective, the Chemical Corps Research and Development Command planned and held an industrial conference during the month of April, 1960, in which the full spectrum of biological and chemical needs was candidly open to industry (including universities and nonprofit organizations in related R&D fields).

Several hundred organizations participated in the conference, which was designed to assist industry in delineating its own R&D capabilities in Chemical Corps areas of interest. In general, it is believed that all participating organizations acquired a broad appreciation of some of the unique and challenging R&D problems facing the Chemical Corps.

However, it was also recognized that a single conference could not possibly supply the continuing impetus required to keep Chemical Corps R&D problems in the foreground of industrial thinking. Therefore, the Study Requirement Program was devised as a mechanism to provide continuity to the effort begun during the conference and as a means to provide industry with more specific and detailed knowledge of Chemical Corps R&D problem areas.



ANTARCTIC WEATHER in Maryland was endured by a research quartet who spent 24 hours living in a temperature of 50° below zero F. in the cold chamber of the Climatic Facility at the U.S. Army Chemical Research and Development Laboratories, checking out clothing and trail gear for use in the U.S. Antarctic Research Program. At times winds blew up to 36 m.p.h. Three of the men, Henry S. Francis, Ray D. Brown, and Philip M. Smith, are affiliated with the National Science Foundation's Office of Antarctic Programs in Washington, D.C., and the fourth, Robert C. Faylor, is with the Office of the Arctic Institute of North America, Washington, D. C.

The precedent for such a program had been estab'ished by the Transportation Corps and the QDRI (Qualitative Development Requirements Information) Program of the Ordnance Corps. The Air Force has also found the use of study requirements rewarding. The Chemical Corps Study Requirement Program, however, was organized along somewhat different lines, and was conceived to enlist the support of the Nation's scientific and technical talent to solve technical problems in urgent military fields.

Although creative and skillful work is being accomplished by Chemical Corps scientists and engineers, there is a real, compelling and continuing need for the Chemical Corps to broaden its base of thinking by bringing in industry's imagination, capabilities, and knowledge toward new ideas, new concepts, and new approaches. This is urgent, as our weapons become increasingly more complex and costly.

The Study Requirement Program was directed toward the accomplishment of four basic objectives: Solution of specific problems; to bring in new ideas and fresh concepts which would broaden the basis for establishing future R&D programs; to gain a fu'ler understanding of industry's wide and diverse capabilities; to establish an effective and direct means of communication between the Chemical Corps R&D Command and its potential contractors.

THE PLAN. The field installations were directed to indicate problem areas whose solutions were important to the Chemical Corps' mission and were believed to be within the capabilities of industry to provide timely and practical answers. Thirty problem areas covering the Chemical Corps R&D spectrum were individually identified as Study Requirement projects.

Each problem was supported in document form by a detailed description of the problem with consideration given to both technical and military aspects, the present state-of-the-art, related past efforts and the organization and technical coordinator to be contacted for further information and assistance.

Those organizations expressing a desire to participate in this program were asked to execute a short, simple policy agreement. In essence, it stated their willingness to undertake an unfunded study and to submit a feasibility report describing the proposed solution within a certain time.

The study was to include recommendations and conclusions supplemented by technical information to support adequately the technical findings and recommendations. Also to be included were estimates of time, resources, effort, and description of special facilities and outside assistance which would be required to resolve the problem under a Chemical Corps contract.

Since many of the Study Requirements were classified, a need-to-know was also established for participants, so that they could be provided with complete background information on all problem areas in accordance with current security regulations. Such early establishment of need-to-know is considered essential to the participant's ability to submit a meaningful feasibility study report or proposal.

Another factor considered of importance to the success of the program is the appointment of a highly capable Study Requirement coordinator at the laboratory level whose duties are closely associated with the problem areas. Such a person provides a direct channel for each participant to the problem source for the acquisition of guidance, consultation, benefit of past experience, and documentary support.

RESPONSE. The response from industry to this program was most satisfactory. A large number of proposals supported by detailed feasibil-

ity study reports, were received covering all of the R&D areas stated as Study Requirements.

Each field installation was made responsible for the evaluation of the proposals relating to its area of R&D responsibility. This procedure permitted the use of specialists for evaluation purposes. Every effort was made to evaluate the feasibility reports objectively, thoroughly, and rapidly.

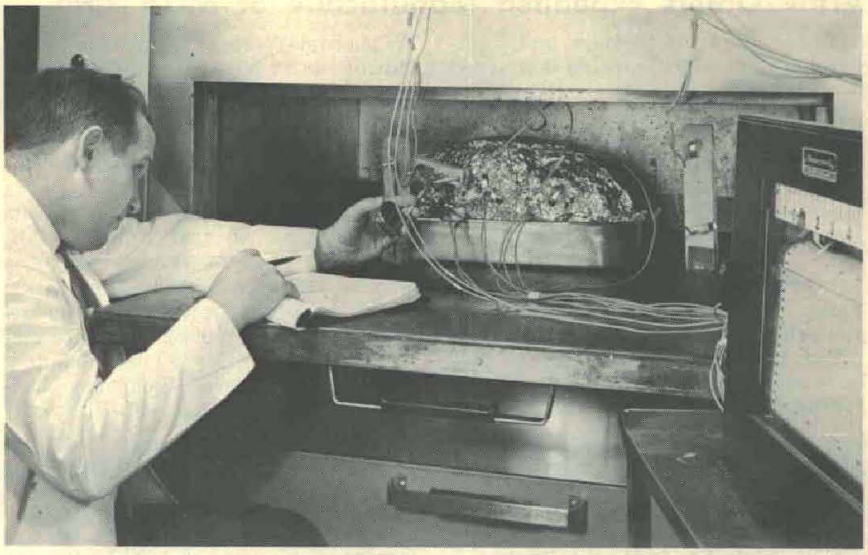
A Technical Evaluation Group was established in each Study Requirement area, consisting of a chairman and at least two other members. Each proposal was competitively evaluated and assigned a numerical ranking based on standardized evaluation criteria. The findings of this group were then reviewed by an Installation Advisory Group, representing the Commanding Officer of the field installation, after which recommendations were forwarded to the Commanding General, RDCOM, for further review and approval.

RESULTS. The Study Requirement Program has resulted in 14 proposals being selected for contract support immediately or in the near future. Three of these proposals are planned as prime contracts. Of the remaining proposals, a significant number are being considered as subcontracts to existing prime contracts.

For the Chemical Corps, this represents a valuable addition of new thinking, new ideas, and new concepts. It has also enabled the Corps to keep abreast of the capabilities and potential of outside industrial and research organizations, thus helping reduce "leadtime" between concept and hardware.

FUTURE. As problems are solved, new problems appear. No one can foretell when a scientific breakthrough may occur which may alter existing concepts and plans. This program is viewed as a mechanism to facilitate such progress on a continuing basis. The Department of the Army R&D Directive No. 70-3, provided for unfunded studies by industrial concerns. The Chemical Corps Study Requirement Program has proved an overwhelming testimonial to the merits of General Trudeau's purpose and policy in this directive.

To keep open the doors to laboratories and to minds, the U.S. Army Chemical Corps intends to continue its Study Requirement Program. Finding new solutions to the problems of the future requires creative thinking and close cooperative effort between military and civilian interests. The success of this cooperation may very well have a deciding influence upon America's strength and security.



Measurements of temperatures in oven are not taken to determine when stuffed turkey is ready for table, but to learn degree and duration of heat necessary to kill diarrhea-causing salmonella bacteria, a serious messhall problem.

Food-Poisoning Salmonellae Getting Heat-Purge Study

Important to the military's large-scale cooking operations is knowledge of how much heat is needed to destroy diarrhea-causing Salmonella bacteria, second only to Staphylococcus bacteria as a cause of food poisoning.

Since salmonellae have varying heat resistance, researchers are conducting studies for the Armed Forces Epidemiological Board's Commission on Environmental Hygiene to come up with reliable extermination information.

Investigations are being conducted by a University of Michigan School of Public Health team headed by Dr. Nicholas A. Milone, Associate Professor of Environmental Health.

Salmonellae are most prevalent in poultry and dairy products but are found in other meats and foods. One of the problems is to learn whether temperatures recommended by most cookbooks for the roasting of poultry actually kill salmonellae.

While it is known what temperatures will kill these bacteria outside the poultry, researchers suspect that the temperature inside, particularly when dressing is added, may on occasion have an incubating effect, especially if the meat is simmered at low heat.

Dr. Malone and his staff believe that salmonellae food poisoning hazards can be minimized or eliminated by proper cooking precautions based on information (1) at which temperature bacteria grow, (2) the temperature at which bacteria are killed in foods other than poultry meat, and (3) the rate at which heat penetrates poultry.

Using turkeys artificially seeded with salmonellae of varying heat resistance, researchers have obtained information on heat penetration by inserting thermocouples to make a continuous record. Still to be established is the oven temperature necessary to raise the temperature inside the turkey high enough to kill bacteria.

Since no specific treatment for salmonellae food poisoning has proved effective, the most effective control method is by "thorough" cooking of food, especially fowl, egg, and meat dishes.

The question still is: How much heat is needed?

N.Y.C. Health Authority Hits Apathy Toward Food Poisoning

Food poisoning hits between 500,000 and 1,000,000 Americans each year, but little is being done to curb the needless illness because most people mistakenly think food poisoning is as inevitable as the common cold.

These findings are included in an article written by Dr. Leon Buchbinder, assistant director of laboratories for the New York City Health Department, and published in Public Health Reports, official journal of the U.S. Public Health Service.

Assailing the lack of food-poisoning control, Dr. Buchbinder blamed the situation on the "unawareness and apathy" of the general public plus "complacent" health officers and physicians.

Army Orders Expedited Manufacture of M-14 Rifle

Manufacture of the new and lightweight M-14 rifle is being expedited in order to reequip the Active Army with the weapon as soon as possible. Brig Gen Elmer J. Gibson has been granted extraordinary powers by the Army to exercise broad authority in the manufacture and supply of the new weapon.

The new rifle will replace four Army weapons, the M-1 rifle now the basic Infantry arm, the submachine-gun, automatic rifle, and the carbine.

The M-14 rifle is being commercially produced by Harrington and Richardson, at Worcester, Mass., and by Winchester-Western Division, Olin Mathieson, at New Haven, Conn.

A third commercial production source is under consideration to further increase the rate at which the rifles will become available for service use.

General Gibson will operate from the Pentagon office of Lt Gen J. H. Hinrichs, Chief of Army Ordnance. General Gibson has spent 14 of his 25 years in military service in management and production of Ordnance materiel, most recently as Commanding General, Ordnance Weapons Command, Rock Island Arsenal, Ill.

Shinkle, WSMR Commander, Raised to Major General

Major General is the new rank of John G. Shinkle, Commanding General of White Sands Missile Range, N. Mex., since June 1960 and the sixth commander of the 4,000-mile square test center since it was established in 1945.

Commissioned in the Field Artillery following his graduation from the U.S. Military Academy at West Point in 1933, General Shinkle has served with the Ordnance Corps since 1937. He is a graduate of the Army Ordnance School, Aberdeen Proving Ground, Md., and earned his master's degree at the Massachusetts Institute of Technology.

General Shinkle's assignments include four years at Aberdeen in the testing and evaluation of Ordnance equipment; Deputy G-4 on the staff of the China Theater Command in 1945-46; Commander of the San Francisco Ordnance District, and Ordnance member of the Joint Brazil-U.S. Military Commission in Rio de Janeiro.

Named Director of Technical Operations at White Sands in January 1951, he next served two years as Executive Officer for the Assistant Chief of Ordnance for research and development. In June 1956 he became Deputy Commander of Redstone Arsenal, Ala., and in March 1958 took over as the first Commander of the Army Rocket and Guided Missile Agency at Huntsville, Ala.

Biochemist Wins $300 Prize at CmlC Conference

Dr. Bruno Papirmeister, biochemist in the U.S. Army Chemical Research and Development Laboratories, Clinical Research Division, received first prize of $300 for a paper presented at a recent 2-day science conference.

Sponsored jointly by the CRDL and the U.S. Army Chemical Corps Nuclear Defense Laboratory (NDL) at the Army Chemical Center, the meeting partially replaced the cancelled 1961 Army Science Conference, originally scheduled for West Point, N.Y.

Fourteen papers, representing the work of 27 Chemical Corps scientists and technicians, were presented.

Dr. Papirmeister found possible future approaches to solving the long-standing problem of developing therapy for the blistering and systemic effects of a chemical agent—the "mustard gas" developed in World War I.

Second prize of $200 was shared by five coauthors of a paper on studies of a modern chemical compound. They were Dr. Bernard J. Jandorf, Chief of the CRDL Biochemical Research Division, Dr. Harry O. Michel, Joseph Epstein, Dr. R. E. Plapinger, and J. H. Fleisher.

Four papers won honorable mention awards of $50 each:

1. A study of liquid penetration of textiles, by Dr. E. A. Wulkow, W. H. Adams, and R. H. Via, of CRDL.

2. Investigations of skin penetrations, prepared by Pfc Billy G. Roberts, Frank J. Vocci, C. V. Lisle, and Col Douglas Lindsey, CRDL.

3. A report on residual gamma shielding by above-ground structures, prepared by Ralph E. Rexroad and Dr. Hans J. Tiller, NDL.

4. Studies of topical therapy as an expedient of massive open wounds, prepared by Maj Janice A. Mendelson, CRDL.

Col Donald E. Yanka, Commanding Officer at CRDL, presented the prizes. Brig Gen Fred J. Delmore, Commanding General of the CmlC R&D Command, reviewed accomplishments of the science sessions.

Dr. Robert D. Coghill, Deputy Chief of Industrial Research Cancer Chemotherapy, National Service Center, National Cancer Institute, was guest speaker at the conference dinner.

Novel Network Gives Dugway Weather Data

A "push button" million-dollar micrometeorological telemetering network, believed the only one of its kind in operation in the world, is used at Dugway Proving Ground, Utah, to help obtain extremely accurate weather forecasts essential for the test work conducted there.

Highly trained personnel, with the most modern equipment available, are responsible for providing specialized meteorological forecasts of the test grid area in support of the U.S. Army Chemical Corps' biological and chemical testing programs at Dugway.

The micrometeorolcgical system consists of a number of unattended weather sensing and transmitting stations located within a 25-mile radius of a receiving-recording console in the Base Weather Station.

Each remote station automatically collects and transmits air temperature, air temperature gradient, dew point and atmospheric micropressure data over transmission lines connected to the receiving-recording unit in the Base Weather Station.

Instantaneous reports from any or all of the remote stations may be received and recorded on an electric typewriter and an automatic card punch machine every 1, 6, 15, or 30 minutes, or on demand.

The recording equipment is designed to control and to accept data from 25 remote sensing stations. Eight of these stations are now available. When the entire network is completed, it will be used for microclimatic research, test control, and evaluation of short-term forecasting in the vicinity of Dugway Proving Ground.

Army Packaging Board Performs Vital Troop Supply Task

Application of military power, when and where needed, requires supply of combat units and supporting elements with usable equipment in the proper quantities at the proper time.

One important part of this supply action is proper preservation, packaging, and packing—problems which led to establishment of the Army Packaging Board in 1945.

Supplies received in an unusable condition in a combat area represent wasted time, material, production capacity, manpower used in manufacture, and space in transportation. More important is the result—the outcome of the battle.

In providing a focal point for coordination of Army-wide packaging operations, the Army Packaging Board functions presently under the Chairmanship of Lt Col Gordon F. Clyde, Standards Branch, Procurement Division, Office of Deputy Chief of Staff for Logistics (DSLOG).

The Board consists of representatives from each of the seven Technical Services, the Storage and Distribution Division, DSLOG, and the Office of the Chief, Research and Development.

Magnitude of the Army's packaging problem is shown by the tremendous inventories, including mobilization reserves, the number of storage depots, and the number of line items required to support troops. The logistic system must provide a uniform flow of supplies that will meet all conditions imposed by the distribution and transportation systems for small-scale wars, a sudden all-out attack, or a large-scale general war.

Through the Board's efforts, uniform preservation, packaging, and packing policies are formulated. The aim is to insure efficient and economical protection for all Army materiel against deterioration and damage in physical and mechanical handling, shipment, and storage from production to end use.

The Board also reviews research and development activities to coordinate the packaging requirements and activities of the Technical Services and acquaint them with all laboratory and field test results. Contact is maintained with industry and industrial associations, independent laboratories, and other agencies.

The Chairman of the Army Packaging Board coordinates activities of joint interest with the Navy Packaging Board and the Air Force Packaging and Materials Handling Division to develop joint statements of policy, instructions, and regulations.

An example is the review and comments made on the draft of Department of Defense Instruction 4100.14—Uniform Preservation, Packaging, Packing, and Marking of Items of Military Supply.

Training of personnel is also of interest to the Board. Certain members represent the Army on the Joint Advisory Group to the Joint Military Packaging Training Center (JMPTC), Rossford Ordnance Depot, Toledo, Ohio.

The Advisory Group consists of representatives from the Army, Navy, and Air Force. It provides broad policy and technical guidance to insure that the course of instruction is responsive to the packaging policies, procedures, and objectives of the three Services.

Representatives to the Army Packaging Board, which recently met at the Quartermaster Food and Container Institute for the Armed Forces, are: (seated from left) C.W.O. Robert A, Starr, Signal Corps; Robert A. Rinschler, Associate Director, Container Division, QMFCIAF; Milton A. Raun, Chemical Corps; David H. Magathon, Corps of Engineers; Lt Col Robert B. Bennett, OCRD; Dr. F. P. Mehrlich, Scientific Director, QMFCIAF; Joseph V. Budeiman, Transportation Corps; John H. Rinck, Ordnance Corps; Harry O. Knutson, Army Medical Service; Charles J. Najjar, Signal Corps; Melvin E. Ault, Ordnance Corps; (standing from left) Col James P. Littlejohn, Commandant, QMFCIAF; Lt Col Gordon F. Clyde, DCSLOG, Chairman; and Albert V. Grundy, Director, Container Division, QMFCIAF.

Mile-High Peak Chosen for Radar Signal Research

A mountain peak a mile high, accessible only by helicopter, will be used as a research site to extend the study of air disturbances that cause errors in radar signals.

On top of Goat Mountain, 45 miles from headquarters of the White Sands Missile Range, N. Mex., a small radio receiver-transmitter, or "beacon," will bounce signals to the radar under test. As the position in space of the transmitter-receiver is known exactly, it will be possible to measure accurately any error in the radar scale reading.

Studies will be carried out under a contract awarded to the University of New Mexico by the U.S. Army Signal Missile Support Agency. The mountaintop site will make it possible for the first time to use a fixed station at high altitude to measure the exact relationship between radar error and certain atmospheric conditions.

Application of research results in this field will permit prediction of radar paths and exact allowance for error in advance of a radar tracking mission. As radars become more precise, especially in missile work, this advance calculation becomes necessary.

Experimental foam-plastic shelter erected at Quartermaster Research & Engineering Center, Natick, Mass. Lightweight foam provides excellent insulation.

Foamed Plastics Research Promises Wide Army Usage

By Dr. George R. Thomas, Chief, Chemicals and Plastics Div., QM R&E Command

Research on foamed plastics conducted by the Quartermaster Research and Engineering Command at Natick, Mass., is producing an expanding potential for Army use of this relatively new material.

Resistant to moisture and fungicidal attack, foamed plastics can be produced in a wide range of densities, with high insulation value, from soft and flexible to hard and rigid, and with open or closed cells.

QM R&E Command researchers are particularly interested in two uses—as energy dissipators in air delivery, and for constructing temporary, easily erected shelters suitable for remote areas. (See May issue, page 16.)

Besides the specific physical properties needed for particular application, another requirement is that the foam can be produced in the field at the point of use, in line with the "Buildings in Barrels" logistics concept.

Studies on foams as energy dissipators led to the development of several formulations (polyurethane-vinyl copolymer foams) that are now being tested by the QMC. These formulations can be foamed at 40° F. By suitable modification, foaming of polyurethane to around 20° F. appears feasible and by the use of ionic catalyzed vinyl monomers, foams have been made at 40° F. below zero.

During the investigation of energy dissipators, the high compressive strength of low-density foams plus their low-heat conductivity indicated that they could be excellent materials for temporary shelters.

One shelter was constructed by spraying a polyurethane foam plastic 3 to 4 inches thick on the outside of an air-inflated form. Hemispherical in cross section, the tent, 20 feet wide, 45 feet long, and 10 feet high, provides 814 square feet of unobstructed floor space.

Noting its coolness and comfort, many visitors, who entered the foamed plastic shelter on a warm Armed Forces Day, asked questions about how it was "air-conditioned."

Actually, continuous temperature recordings through one summer showed that the interior temperature never rose above 78° F., even when the outside surface temperature exceeded 140° F. During below-zero temperatures in one winter, the inside temperature remained close to 32° F. and the ground within the shelter never froze.

During the construction of the foamed-on-site shelter at Natick, it became apparent that the most advanced spray equipment being used at the time required considerable modification. The equipment is now being redesigned by the manufacturer.

Although experimental shelters are produced by spraying, present spraying techniques are considered too complicated for QM applications. QM requirements demand a much simpler method for field use. Simpler methods to take advantage of the benefits inherent in foamed plastics for shelter applications under all field conditions are now under study.

Several new ideas have been developed by the QM R&E Command for foamed-on-site shelters, ranging from small individual shelters to large structures for maintenance, storage, and personnel, such as temporary field hospitals. Experiments are planned, within available resources, to assess these newer concepts.

Meanwhile, civilian applications of foamed plastics are engrossing the attention of industrial researchers. An executive of a major plastics concern predicted in late June that plastic homes can be expected by 1980.

Quartermaster Distributes Atlas of Arctic Environment

An atlas showing distribution of elements of Arctic environment has been published by the Quartermaster Research and Engineering Command, Natick, Mass.

The *Atlas of Arctic Environment* was prepared for the Geophysics Research Directorate, Air Force Cambridge Research Laboratories, Bedford, Mass.; as part of a study of the feasibility of using unprepared landing sites in the Arctic for wheeled aircraft.

Intended as an aid in regional differentiation rather than for detailed planning, the series includes maps delineating the major physiographic features and vegetational zones, as well as climatic zones. Information includes the frequency of January temperatures below various values, the mean freezeup and breakup dates for river ice, the occurrence of freeze-thaw cycles, the mean snow depth, and the mean number of days with precipitation in each of the summer months.

Copies of the Atlas have been distributed within the Department of Defense by the Air Force Cambridge Research Laboratories.

IRE Elects USASRDL Leader To Head Professional Group

Willie L. Doxey, Director of the Electronic Component Department, U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J., has been elected national chairman of the Professional Group on Military Electronics of the Institute of Radio Engineers.

Mr. Doxey has been a member of the national administrative committee of IRE for two years and served as East Coast vice chairman since July 1960. He began his service with the Department of Defense in 1942 as a physicist in the Research and Development Division in the Office of the Chief Signal Officer, Washington, D.C.

HONEST JOHN Contract Awarded

The Army has awarded an $8,540,-057 contract to the Douglas Aircraft Co. for production of components for the improved HONEST JOHN rocket.

The modified version of the free-flight rocket, capable of carrying either conventional high explosives or a nuclear warhead, has range and accuracy capabilities exceeding those of its predecessor.

Plastic Container Tests Seek Decreased Shipping Weight

Investigation of the feasibility of using weight-saving plastic shipping containers is underway by the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va.

Developed by the Packaging Development Branch, the container is formed by two separate aluminum molds. Polystyrene beads are fed into the mold by vacuum and then subjected to steam pressure to expand and fuse the beads compactly.

On removal from the mold, the container is ready, without further preparation, to house the item to be shipped. The two halves are fastened together with either metal strapping or reinforced filament tape.

A container designed to house a 3-hp. military engine is undergoing engineering tests. It weighs only six pounds, much lighter than the fiberboard or wooden box currently used to ship the 42-pound engine.

Tests thus far indicate the new container is easier to pack, waterproof, rugged enough to withstand rough handling, and can be used repeatedly.

Broadway Ordnance QDRI Office in "Show" Business

To many people the term "Broadway agency" brings to mind just one thing: show business. Essentially, but with no relationship whatsoever to amusement, that is the mission of the New York Ordnance District.

Located at 770 Broadway, New York City, the procurement agency for the past three years has been providing science and industry with information to show the defense requirements of the various Ordnance Corps arsenals and commands.

Based on the principles that successful research should be rewarded, the Qualitative Development Requirements Information (QDRI) Program introduces interested organizations to those Ordnance arsenals and commands which have corresponding fields of interest. The aim is to provide a guide and direction to company-sponsored research.

Information consists of current and future Ordnance requirements for research and development of new items, components, materials or techniques. Sought is the earliest feasible exploitation of new knowledge in the fields of ammunition, weapons, tanks, vehicles, rockets, missiles, and space exploration.

Under the QDRI Program a qualified organization is any U.S. individual, firm, partnership, corporation or other type of civilian organization which has (1) expressed a desire to participate in the R&D effort of the Ordnance Corps, (2) presented acceptable evidence of an adequate R&D capability, and (3) furnished the required signed copy of a Policy Agreement for release of Qualitative Development Requirements Information.

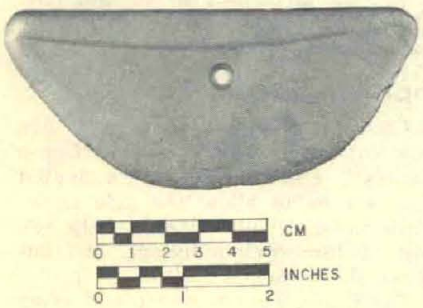
Evidence that the large and diverse scientific community in the New York District (New York State and Northern New Jersey) has welcomed QDRI includes the fact that more than 450 organizations, large and small, have executed Policy Agreements with the Ordnance Corps.

Inquiries regarding the QDRI Program may be directed in writing to the attention of the Production Equipment and Materials Branch of the New York Ordnance District, U.S. Army, or to the Operations Branch of the District's Regional Office, Siblet Tower Building, Rochester, N.Y. In other areas of the country inquiries should be sent to the local Army Ordnance District office.

Wallops Island APG Man Links Stone, Atomic Ages

Tools used by primitive men who lived 5,000 years ago have been turned up on Wallops Island, Va.—by men primarily concerned with tools that will bring about the space age.

The link between the Stone Age and the Atomic Age was unearthed by bulldozers used in the construction of launching pads and blockhouses for missiles and rockets.



Stone Age man wielded this knife on site where men now launch missiles.

While on a tracking mission at Wallops Island for the Ballistic Measurement Branch, Ballistic Research Laboratories of Aberdeen Proving Ground, Md., Charles E. Schafer found a perfect specimen of a semilunar knife.

Made of gray slate, the knife is slightly less than five inches long and about two inches wide. Its thickest part, at the top, measures about three-eighths of an inch. Archeologists have placed it in a time period of 5,000 years ago.

Mr. Schafer took his find to George M. Reynolds, another Aberdeen scientist, who is president of the Northeastern Chapter of the Archeological Society of Maryland.

Working with Maryland and Virginia archeologists and the Smithsonian Institution, Mr. Reynolds was able to verify the authenticity and importance of the half-moon shaped knife. Similar knives have been found in the northeastern part of the United States, but none has been found previously so far south.

Mr. Schafer has presented the artifact to Mr. Reynolds' Chapter, which has placed it on exhibition in Elkton.

QDRI Spurs Outside Aid For Army Missile Program

Under a program titled Qualitative Deve'opment Requirements Information (QDRI), some 700 companies are now qualified at White Sands Missile Range, N. Mex., to submit ideas in response to published requirements for the Army missile and rocket R&D program.

Previous to the establishment of this program in 1958, many new ideas were submitted voluntarily by industry but suggestions were not always compatible with the Army's aims. The Ordnance Corps plan specifically informs industry of what the Army needs in the way of basic and supporting research.

Particularly interesting to industry is the measurement of blast phenomena at high altitudes and more efficient and rapid recovery of impacted missile fragments and objects. Another important phase of missile firings is a quick compilation of a missile's performance in flight. For this an electronic device is required to display experimental data, enabling engineers to determine quickly results of a complex missile test.

These three requirements have been released, producing a gratifying response from industry. Preliminary negotiations for contracts may soon be put in motion.

When the program began at White Sands, only 25 companies were listed. Now approximately 16 companies are added each month, with 50 percent listed as small business.

All ideas and proposals received in response to QDRI releases are evaluated for technical and economic feasibility of application at WSMR. When submissions are rejected, the companies are notified and told why.

Plans and Operations has the overall coordinating responsibility for QDRI and serves as the point of contact between WSMR elements, other Ordnance activities and private industry.

With such an expanded participation, QDRI increases the chances of solving many missilry technological problems and achieving breakthroughs by combined efforts of Government and industry.

New Radio Relay, Half as Large, Doubles Messages

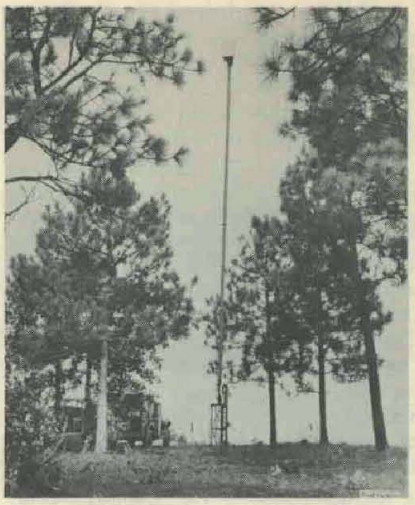
Double the message capacity in half the size of present equipment is achieved in a new microwave relay radio that has successfully passed Army user tests and gone into production.

The radio, the AN/GRC-50, was developed by the U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J. The Radio Corporation of America was the development contractor and will build 380 units at a cost of $9,466,767.

Traffic capacity of the new radio is 24 voice channels or 384 teletypewriter channels, each carrying 100 words per minute—for a total of 38,400 words a minute. A simple internal adjustment provides full traffic capacity, either by time division or frequency division multiplexing.

Designed to provide line-of-sight communications on the corps or division level in the frequency range of 600 to 1,000 megacycles and 1,350 to 1,850 megacycles, the set can be used either as a terminal or as a repeater. With relay stations set up 30 miles apart, communications links can be provided up to 240 miles without serious signal degradation.

As a vehicular set, the AN/GRC-50 is mounted in a shelter carried by a ¾-ton truck, while the present set requires a 2½-ton vehicle. A trailer hauls the rest of the equipment, including the gasoline-driven generator and horn-type antenna mounted on a collapsible 48-foot mast made by Magnesium Products, Inc. of Milwaukee, Wisc.



The new AN/GRC-50 microwave radio relay set, complete with antenna, shown during service tests conducted by the Airborne and Electronics Board of the U.S. Continental Army Command (USONARC) at Fort Bragg, N.C. The 48-foot collapsible mast (AB-577) supports a horn antenna.

The radio can be put into operation in 15 minutes or less, including erection of the antenna mast to its full height.

Rocket Belt Showing Stirs Memory of Forerunner

When the jet (rocket) vest was recently demonstrated at Fort Eustis, Va., it was particularly gratifying to Tom Moore, a physicist at the U.S. Army Rocket and Guided Missile Agency, and Herman F. Beduerftig, now with the Marshall Space Flight Center.

They worked on it in a project that began with studies and sketches in 1951 at Redstone Arsenal and carried through to tests that demonstrated feasibility of the same principle used by Bell Aerosystems Co. to develop the man-rocket device for the Army Transportation Research Command.

Initially, Moore recalls, a dummy was successfully lifted into a hovering position with the device in tests at Redstone. Later on a live pilot hovered for several seconds using the equipment. The project was later transferred from the Ordnance Corps to the Transportation Corps for further development.

Pictures of the rocket belt, Moore said, reveal a striking similarity to the device used in the Redstone tests almost 10 years ago. He envisions soldiers using it to cross rivers or leap up hills or other natural obstacles, and believes it could have civilian applications. One might be equipping firemen or rescue workers with it to allow them to leap up the sides of burning buildings.

Moore pointed out, however, that the device is still a long way from the stage where it could be used for day-to-day commuting.

Civilian Employees Cited For Outstanding Services

Thirteen civilian employees of the Chemical Research and Development Laboratories at the Army Chemical Center, Md., recently received honorary awards.

Lawrence C. Buckles and Stephen M. Lewis of the Physiochemical Research Division each received the Meritorious Civilian Service Decoration. The citation noted their ability, perseverance, and imagination directed toward the discovery and development of a technique of stabilizing chemical compounds. Mr. Buckles is Chief of the Physical Methods Branch, where Mr. Lewis is employed as a physical chemist.

Three employees each received a Certificate of Achievement for contributions to the Chemical Corps "Blue Sky Program." The program is designed to encourage original and unique concepts in chemical and biological defensive measures within the Chemical Corps, Defense Department, industry, universities, and research organizations.

Daniel F. Reisenweber, a physical science administrator at the Laboratories, was awarded a certificate for a suggestion "of potential value to the national defense effort," a new approach to maneuver agents.

Charles E. Williamson, an organic chemist at the Laboratories, received a certificate for a suggestion pertaining to discovery of a new class of rocket fuels.

Paul E. Reynolds, a program evaluating officer, was awarded a certificate for a suggestion regarding a new approach to the study of chemical and biological defensive measures.

The following employees of CRDL received cash awards and certificates in recognition of sustained superior performances: Josephine G. Adams, Process Development Division, $100; Bluford A. Dawkins, Munitions Development Division, $100; George G. Morris, Test Division, $200; Robert M. Black, Test Division, $300; Charles R. Bulette, Physiology Division, $100; Nellie A. Cupp, Safety Division, $150; Hazel P. Basham, Mail and File Record Center, $150; and Myra A. Appel, Clinical Research Division, $100.

Engineers Push Projects to Improve Icecap Camps

Increments of Company "C," 588th Engineer Construction Battalion, Fort Belvoir, Va., arrived recently by aircraft at Camp Tuto, Greenland, to begin construction for the U.S. Army Polar Research and Development Center's support of R&D projects.

The 153-man company, commanded by 1st Lt William T. Stockhausen, is divided between ice research sites at Camp Tuto, 14 miles southeast of Thule Air Base, and Camp Century, located 138 miles out on the Greenland Icecap.

Company "C" will construct five new cut-and-cover trenches at Camp Century, raise the existing corrugated roof arches to allow the side snowwalls to be trimmed back, set up 352 feet of Jamesway buildings, and improve the present facilities.

The Camp Tuto segment will erect a central maintenance building for shops that are now scattered, construct 13 other metal buildings, improve the existing water lines, and build the needed R&D office space and laboratories.

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

During a visit to a strange village where he was unknown, Nasreddin Hoca went into a hamman or a public bath. Seeing that he was poorly dressed, the attendants paid him scant attention. He was issued a sleezy, torn and dirty rag and given no help.

As he left the hamman, however, Nasreddin Hoca gave a gold piece to each of the surprised attendants, who were deceived by his humble attire.

The following week, Nasreddin Hoca went to the same hamman, in the same dress as before. But this time the attendants brought him new towels, perfume and fresh soap; scrubbed, washed, and massaged him; and carefully helped him dress—their palms tingling with anticipation of gold.

But on leaving the hamman this time, Nasreddin Hoca gave only a nickel to the attendants—much to their consternation and protest.

Whereupon Nasreddin Hoca replied: "The gold pieces I gave you last week were for the manner you treated me today. The nickels I gave you today are for the manner you treated me last week!"

It is amusing to note the way in which some individuals argue their point by personal attacks on others. At times, they seem to get away with it—which again reminds me of Hoca.

A neighbor—so the story goes—asked Nasreddin Hoca for the loan of his donkey. Not wanting to do so, Nasreddin Hoca said that he had already lent his donkey to someone else. Just at that very moment, however, the donkey, which was in the stable close by, brayed.

The neighbor upbraided Nasreddin angrily: "You should be ashamed to lie at your age, Hoca. Even your own donkey testifies against you!"

To which, Nasreddin Hoca calmly replied, while closing the door: "I cannot argue with a person who gives greater credence to the braying of a donkey than to the words of his fellow men."

The Cicada and the Wren

Gaining acceptance for a visionary proposition frequently brings to mind the story of "The Cicada and the Wren" by Chuang-tze (third century B.C.). The story goes something like this:

Somebody mentioned that there are birds capable of flying hundreds of miles without stopping.

"This is impossible," said the Wren.

"We know very well," the Cicada agreed. "that the furthest one can get to with even the greatest effort is that elm tree over there. And even this one cannot achieve with certainty. Often, one drops to the ground long before reaching it. All these claims about flying hundreds of miles without stopping are sheer nonsense.

Army Saves $666,000 Yearly In Slash on Watch Pockets

With wristwatches as common as fleas on a dog, the Army decided that the watch pocket of uniform trousers was useless. Forthwith, it abolished the pocket—and is saving $666,000 a year tailoring costs.

Listed recently also for a House Armed Services subcommittee to show what savings the Army has made in procurement in the past year were such items as:

Adoption of twofold neckties instead of fourfold, saving $138,000; elimination of storm tabs on wool overcoats, saving $1,000,000; substitution of fiberboard for wooden shipping containers, saving $100,000 a year in packing trousers alone.

USAERDL Generator Used In Antiaircraft Defense

A new 15-KW diesel precise power electric generator intended primarily for use in the antiaircraft defense system has been developed by the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va.

Designed for powering radar equipment, the new engine generator also may be used in many other military field applications where portability is of prime importance. It weighs 2,286 pounds, including dry batteries, is 5 feet 5 inches in length, 2 feet 5 inches in width and 4 feet in height.

Sixty and 400-cycle generators can be built to the same overall dimensions so that space provided for trailer mounting of one can readily accommodate the other to provide either kind of electric power.

Many of the engine accessories are interchangeable among a family of engine generators under ERDL development.

Satire on Newton's Career Mirrors Research Woes

". . . during a 5-year period he served on 379 committees, which investigated an aggregate of 7,924 problems of campus life and solved 31."

This bit of byplay on the idiocies of organized time-wasting is taken from a satirical account of the brambles through which Sir Isaac Newton purportedly was forced to scratch his way as a member of the faculty of Cambridge University while he was striving to find proof of his hypothesis of a universal law of gravitation.

Aimed, tongue in cheek, at encouraging the increasing number of young scientists now engaged in scientific research sponsored by the U.S. Government, the account mentions the miserly stipend Newton received.

In the same vein, Newton is followed through tribulations such as the involved governmental procedures involved in getting a grant and security clearance, the side-tracking of the purely scientific core of Newton's hypothesis into a program to improve British apple-growing, the morass of administrative problems — "He personally filled out 7,852 forms, often in quintuplicate and sextuplicate"—and the proliferation by the university's Dean of Research of the apple-improvement project into one for the improving all British-grown fruits.

"This period of his life was a happy and profitable one for Newton," the fictional account narrates. "From the time he arose in the morning until, exhausted with honest labor, he dropped late at night into his humble bed of straw, he spent each day filling out payroll forms for his milkmaids, ordering pens and paper, answering the questions of the financial office, and showing distinguished visitors and the Dean of Research around his subproject (apple-improvement).

"Often he discussed the past, present, and future work of his project with representatives of the five governmental departments and seven fruit growers who had been sent to check on his progress. He was frequently invited to give progress reports in person at the central offices of these 12 sponsors. Each week he wrote out a full progress report which was duplicated and sent by special messenger to 3,388 other projects sponsored by His Majesty's Government throughout the British Isles . . ."

Through these and other vicissitudes the great scientist passed, including trial on a charge of subversion, before the Subcommittee for Suppression of Non-British Ideas.

"Eventually he was exonerated, and after enjoying many years of the fame that was due him, reigning one day each year as King of the Apple Festival, Newton died happily."

Army R&D Newsmagazine regrets that it cannot, because of space limitations, reprint in full the lampoon, which appeared recently in the New York University publication Engineering Research Review. The author is J. E. Miller, Chairman, Department of Meteorology and Oceanography.

New Survey Tools Assure Combat Units Fast Data

Principles of inertial navigation are being applied to the development of field equipment designed to give military combat units fast and accurate survey data. R&D are the task of the Geodesy, Intelligence and Mapping Research and Development Agency.

Unjammable and undetectable by hostile forces, the new surveying tools offer a method of rapidly determining geographical position, azimuth and elevation under all conditions. Conventional survey methods are time-consuming and frequently impossible in bad weather.

A twofold GIMRADA program is aimed at developing: (1) tripod-mounted gyro theodolites for azimuth determination in artillery surveys and missile orientation prior to launch; and (2) vehicle-mounted inertial platforms yielding position and elevation data for missile launching.

The premise for the gyro azimuth theodolite program is that a gyroscope properly constrained to remain in the local vertical of the earth senses earth rotation and will align its spinning axis parallel to the earth's axis of rotation. The gyroscope thus establishes a north reference for an attached theodolite.

This type of equipment, tested by GIMRADA, indicated it was suitable for use by the field Army. The equipment provides azimuths accurate to 30 seconds of arc at mid latitudes and 60 seconds of arc at 60 degrees latitude. The gyro azimuth theodolite is in production and first units will be available to the user late in 1961.

Gyro azimuth theodolite developed by GIMRADA to speed field surveys.

The vehicle-mounted inertial surveying equipment program utilizes a gyro stabilized platform to provide a horizontal and vertical reference for acceleration sensing components. Outputs from these sensors are integrated twice to provide distance traveled. This information plus initial conditions inserted at the start of a survey operation is required by an associated data processing unit to derive vehicle position and elevation. The gyro stabilized platform also serves as a north reference for azimuth readout by means of a theodolite. Fabrication of this equipment is under way.

Accuracy is obtained by a calibration scheme which minimizes error buildup resulting from gyro drift. The technique requires that the vehicle be stopped periodically to read errors in the acceleration sensors resulting from gyro drift. These errors are applied as corrections to subsequent positional data.

Aircraft Sensors Check Detectability of Under-Snow Camps in Greenland

Temperature of the snow "roof" covering Camp Century in Greenland is well below freezing, but it could be "hot" enough for enemy aircraft to detect the camp beneath it.

To determine if aircraft carrying conventional aerial cameras and other sensors could detect what is invisible to the eye, the U.S. Army Cold Regions Research and Engineering Laboratory, formerly the U.S. Army Snow Ice and Permafrost Research Establishment (SIPRE), and the Signal Corps recently made experimental flights over the under-ice tunnels and under-snow camps on the Greenland icecap.

SIPRE, a Corps of Engineers activity, was assisted by the University of Michigan's Willow Run Laboratories, which supplied an aircraft equipped with low light-level cameras (for the arctic night) as well as infrared scanners and a crew specially trained in operating the equipment.

Sensitive to thermal reaction, the scanners were flown over areas selected to represent conditions of military importance on the icecap. The specially-equipped plane scanned four targets having different ground conditions.

In preparation for the Greenland studies SIPRE engineers and scientists, together with scientists from the University of Michigan's Willow Run Laboratories, "scanned" targets in northern Michigan for the past several winters. Temperature and emissivity targets were placed on the ground surface and beneath the snow for purposes of equipment calibration and feasibility of detection.

The infrared sensor recorded the energy radiating from the topmost molecules on the snow's surface. Detection of an under-snow camp may depend on how much heat the surface snow receives from the camp below it. A target 20 degrees warmer than its background is considered "hot" (even though it is below freezing) and shows very clearly on the strip.

SIPRE's experiments in infrared scanning have differed from previous research in this field in two ways. They were concerned primarily with radiations emitted by terrain targets which are at temperatures below freezing. Also, ground crews have made careful radiation measurements of target surfaces at the exact time the aircraft carrying the infrared sensor flew over.

Crews stationed on the four targets in Greenland each have used a number of instruments for recording data. Some of these measure the natural and meteorological conditions, which influence considerably the capability of detecting radiation. A thermal image of a certain target which can be readily obtained on a calm day may be completely obliterated on a windy day.

Snow-density measurements have been made in each of the four target areas. Project leader James McLerran points out that a trail, because it is more compact than surrounding snow, conducts heat to the surface more readily than the loose snow on either side. The difference in surface radiation produces the "thermal image."

Infrared sensing in the Arctic has differed from similar work in other areas in that snow radiates comparatively little heat and temperature differences. Many problems must be solved before the greatest possible use can be made of infrared scanning over any kind of terrain. Infrared energy of certain wavelengths can pass through the atmosphere while energy of other wavelengths is more or less absorbed.

Since present detectors are not all sensitive to the same wavelengths, scientists from SIPRE and the University of Michigan have recommended the development of detectors sensitive to longer wavelengths.

Achievement Recognized By QM R&E Command

Research Directors' Awards for scientific achievement at the Quartermaster Research and Engineering Command, Natick, Mass., were presented recently to Frank Rizzo for development and to Dr. Gail Miller for research.

Scrolls and keys symbolic of the award, one of the Command's highest honors, were presented by Brig Gen Merrill L. Tribe, Commanding General, and Dr. Dale H. Sieling, Scientific Director.

Mr. Rizzo, Chief of the Dyeing Branch, guided development of a new and advanced type of color-measuring machine. For the first time, it provides a means for determining in numerical values the degree of color matching of textile samples against a color standard. The textile industry has responded with considerable interest to the potential of the device.

Now associated with the Salk Institute for Virus Research, University of Pittsburgh, Dr. Miller was head of the biochemistry laboratory at Natick when he refined techniques for studying enzymes and their actions. His system makes possible the separation of an enzyme into 24 active components; earlier workers found only one.

Cited recently for outstanding work in electrophoretic separation by Dr. Arne Tiselius, Nobel Prize winner, of the University of Uppsala, Sweden, Dr. Miller has developed microtechniques by which a very small amount of cellulose can be degraded and the decomposed products separated within a single working day.

Research Directors' Awards are made annually to QM R&E Command personnel who distinguish themselves by notable accomplishment.

Device Designed to Dehumidify JUPITER Electrical System

A dehumidifier designed to eliminate malfunction of JUPITER missiles due to moisture in the electrical circuitry has been developed by the Engineer Research and Development Laboratories, Fort Belvoir, Va.

Development of a special type was necessary because commercial units were found too delicate for rough handling and transportation over rough terrain at JUPITER sites.

Weighing 370 pounds, the unit incorporates a normal refrigeration cycle with the addition of a reheat coil, and has adequate capacity to meet JUPITER launch requirements under a wide range of weather conditions. It was built under contract by Ellis and Watts Products, Inc.

Moisture Detector Protects Vital Instruments

An electrolytic hygrometer for use at missile installations and other areas where undetected moisture might cause malfunction of vital instruments and equipment has been developed by the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va.

The instrument is capable of detecting moisture in high pressure air up to 6,000 pounds per square inch and also of measuring moisture content down to a free air dew point of –100° F.

In use, the instrument absorbs and simultaneously electrolyzes all moisture from a sample gas stream. The absorption and electrolysis are accomplished in a small diameter tube containing a pair of closely spaced platinum wires wound as a double helix on its inner surface and coated with a thin film of phosphorous pentoxide, a material with a strong affinity for moisture.

Consolidated Electrodynamics Corp. and Beckman Instruments, Inc., built the equipment under contracts with the Laboratories.

Portable Meter Measures Surface Reflections

A portable reflectance spectrophotometer that makes it possible for the first time to measure surface reflectance of soils and vegetation in natural environments is being tested by the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va.

Data obtained from the instrument are used as a guide in the development of aerial photographic techniques for the detection of obstacles. Reflectance data obtained in this manner have many applications to engineering, mineral, and water surveys as well as to military problems.

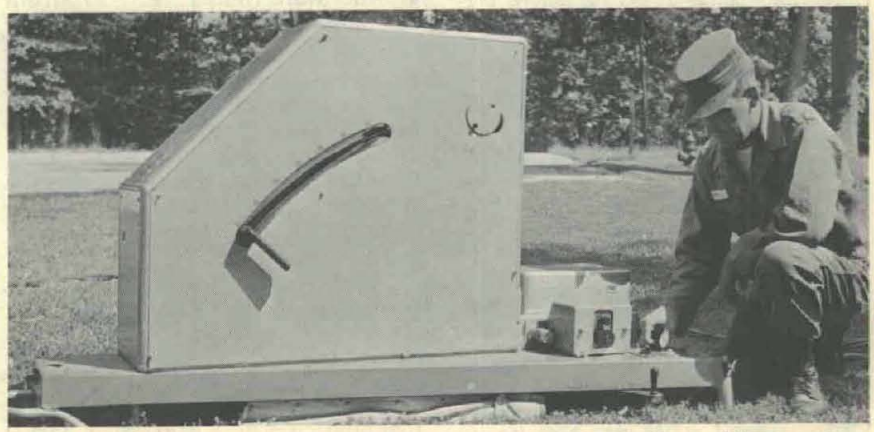
Prior to the development of this instrument samples had to be taken to a laboratory for measurement, but the reflectance data thus obtained did not truly represent the reflectance properties of undisturbed samples in their natural environment.

Reflectance data obtained in the field with the new instrument have provided accurate information on which to base selection of film-filter combinations having optimum characteristics for registering a desired tone contrast between objects to be differentiated on the photographs. A reflectance difference registers as a photographic tone difference if the film-filter combination exploits that region of the spectrum where a reflectance difference exists.

The portable reflectance spectrophotometer employs a high pressure Xenon lamp as an illumination source and measures diffuse reflectance over a spectral range from 250 to 1500 millimicrons. The sample area viewed is about 6 inches in diameter and can be examined in an undisturbed state. Marked differences in reflectance properties are often observed between the undisturbed and disturbed samples.

The basic instrument weighs less than 200 pounds and is connected by 50-foot cables to power supplies, amplifiers and recorder in an instrumentation trailer.

The instrument was developed by the Laboratories at Belvoir and the Perkin-Elmer Corporation, Norwalk, Conn. Major credit for the concept of the instrument and its application to field measurements is given to Mr. Harry Keegan of the National Bureau of Standards and to Prof. Robert N. Colwell of the University of California, Berkeley, Calif.



Portable spectrophotometer weighing less than 200 pounds enables measurement of reflectance of soils and vegetables in natural environment for first time.

"Miss Northern Virginia" (Miss Sandra Lee Collier), center, was greeted by Col John E. Walker, right, Acting Director of the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va., and Col L. L. Haseman, Director of the U.S. Army Engineer Geodesy, Intelligence, and Mapping Research and Development Agency, when the beauty queen and two of her "Princesses," Miss Betty Fink, left, and Miss Carolyn Roland, visited the Laboratories during observance of the 186th anniversary of the Corps of Engineers. Miss Collier is the daughter of M/Sgt (Ret.) and Mrs. Grady Collier, an employee at the Laboratories.

Ordnance Corps Slates Exhibit Of Weapons Produced Abroad

Under the auspices of the Ordnance Corps, a display of foreign weapons will be shown in the Pentagon Concourse, Washington, D.C., Sept. 11-15, to show how the U.S. Army keeps abreast of weapons progress abroad as a means of developing superior systems.

Included in the display will be scale models of foreign weapons, photographs of combat and transport vehicles, and an exhibit of materials critical to weapons requirements, with slides and commentary to show foreign armaments.

Brigadier Generals Reassigned

Brig Gen James A. Richardson has been reassigned from Special Assistant to the Chief of Ordnance, Washington, D.C., to the Office, Deputy Chief of Staff for Logistics, Washington, effective in July.

Brig Gen Howard K. Eggleston has been reassigned from Director of Military Supply, Office, Chief of Engineers, Washington, to the Military Assistance Advisory Group to Vietnam, effective this month. He will be the Deputy Chief of the MAAG for Logistics.

CmlC Labs Given Safety Award

The U.S. Army Chemical Corps Award of Honor for outstanding safety performance was presented recently to Col Carl S. Casto, Commanding Officer, U.S. Army Chemical Corps Biological Laboratories, Fort Detrick, Md.

Maj Gen Marshall Stubbs, Chief Chemical Officer, presented at the same time the National Safety Council's Award of Merit to the Biological Laboratories for outstanding safety performance. Both awards were for FY 1960.

Redstone Awards Contract For Solid Rocket Test Stand

Award of $1,211,453 contract for installation of a solid propellant rocket motor test facility at Redstone Arsenal, Ala., has been made to the Aerojet General Corp.

The new facility will be capable of handling captive firing tests for all Army missile motors. The structure has been designed to absorb the thrust of rocket motors, of present and forecast magnitude, with an adequate safety factor.

WSMR Man Heads Tech Program For Environmental Symposium

Frank P. Merry, Chief of the Environmental and General Branch of the White Sands Missile Range Ordnance Mission Electromechanical Laboratories, N. Mex., has been named technical program chairman for the symposium to be held by the national Institute of Environmental Sciences in Chicago in April 1962.

Chosen by the Institute's executive committee, Perry will head a screening committee to solicit and review papers by Institute members for the symposium program.

The Institute is composed of scientists and engineers engaged in investigating climate and other environments, from subocean to outer space.

$42 Million in Contracts Let For Work on Missile Systems

Four contracts for work on the PERSHING, NIKE HERCULES and SERGEANT missile programs were awarded by the Army recently.

The Martin Co. received two PERSHING contracts totaling $7,787,000. The Western Electric Co. $4,435,032 contract calls for NIKE HERCULES ground guidance and control equipment.

A $29,980,102 contract was awarded to the Sperry Rand Corp. for continued production and procurement of the SERGEANT ballistic missile system, related ground support equipment and test equipment.

Contracts totaling $29,744,432 were awarded to Chrysler Corp. for 8,503 trucks--$26,565,932 for 7,453 ¾-ton trucks for cargo and ambulance purpose, $3,178,500 for 1,050, 1-ton trucks.

U.S. Forest Service Closes Vicksburg Research Center

The Vicksburg Research Center of the U.S. Forest Service Southern Forest Experiment Station, operated since 1951 in cooperation with the U.S. Army Engineer Waterways Experiment Station, has been closed.

During the past decade Forest Service personnel have gathered soil and weather information in many areas throughout the United States and funneled it to Vicksburg.

Personnel of the center have helped to develop a system by which the moisture content in the upper foot of soil can be estimated with only a rudimentary knowledge of soil characteristics and rainfall. Byproducts of the studies include many methods and techniques useful in soils research.

Since its inception, the Vicksburg Research Center worked closely with the Army Mobility Research Center at Waterways Experiment Station.

ARGMA Director Promoted

James E. Norman, Technical Director of the Research and Development Operations, Army Rocket and Guided Missile Agency, has been promoted to the "super grade" level.

Norman came to Redstone Arsenal, Ala., in 1952 to serve as assistant to the Technical Director of Redstone.

Decker Urges Science Training

General George H. Decker, Army Chief of Staff, recently told the graduating class at the Pennsylvania Military College that postgraduate training of military officers is required to adapt science and technology to U.S. defense.

General Decker said that about 2,200 Army officers have obtained advanced degrees in the physical sciences, 100 of which have been doctor's degrees, since the end of World War II.

CRD Announces Winners of 22 Army R&D Achievement Awards

(Continued from page 1)

Basic to the selection of the award winners was the criteria stipulation that an "achievement will be regarded as significant when it (1) establishes a scientific basis for subsequent technical improvement of military importance, and/or (2) materially improves the Army's technical capability, and/or (3) contributes materially to national welfare."

Army research and development are geared primarily to immediate or long-range military requirements. But many of the scientific achievements recognized by the initial awards already are illustrating what General Trudeau has emphasized repeatedly—that Army research continuously redounds in widespread applications or benefits to the civilian scientific community.

Worldwide in significance, for example, is the work of three Army scientists in the invention and development of fluid amplification control systems. Recognized earlier by an honorary award, this achievement is having a profound influence upon industrial designers throughout the United States and abroad.

In the Life Sciences field, progress in Army science affecting the lives and welfare of untold thousands is reflected by the R&D Achievement Awards. Particularly notable are results of germfree animal research, "sterile tent" surgical techniques, modern methods of resuscitation now practiced worldwide, and a technique to save lives of thousands of newborn infants who die of neonatal asphyxia.

In the Physical Sciences and in the Earth Sciences, likewise, Army scientists advanced knowledge vital to progress in missiles research, to modern meteorology, to high-temperature ceramics and other critical materials, to improved communications, to exploration and habitation of the far polar regions.

Stretching across all the major scientific disciplines and currently into 105 subfields, Army R&D touch upon and deal effectively with many thousands of problems and requirements. The Army R&D Achievement Awards indicate the broad diversity of this effort.

Citations upon which several of the awards are based contain classified information; accordingly, the unclassified synopsis of achievement, in some instances, is couched in somewhat obfuscated terms.

Award winners and brief descriptions of achievements for which they gained recognition are as follows:

PIERCE W. SIGLIN, U.S. Army Signal Research and Development Laboratories, Fort Monmouth, N.J., carried out technical direction of a large-scale program for development, installation and experimental use of the COURIER communication satellite and associated ground stations. Within 13 months the entire complex operation was ready for the satellite launch. Mr. Siglin is a GS-14 Supervisory Electronics Engineer.

JOHN C. WHITE, Headquarters XVIII Airborne Corps, U.S. Continental Army Command, Fort Bragg, N.C. As an Electronics Engineer, GS-12, he served with the U.S. Army Airborne and Electronics Board, gaining recognition for consistently high performance in developing equipment proposed for field Army use.

DR. DAVID McK. RIOCH, Walter Reed Army Institute of Research, Washington, D.C. Through his leadership a research group made outstanding contributions to the therapy of military psychiatric patients; also, advanced knowledge of the learning processes, physiological responses to stress and fatigue, and psychosomatic disorders. Dr. Rioch is a PL-313 Neuropsychiatrist.

DR. ROBERT J. EICHELBERGER, Ordnance Ballistic Research Laboratories, Aberdeen Proving Ground, Md. Internationally recognized as an authority on shaped charge theory and application, and as a prime authority on hyperballistics, Dr. Eichelberger initiated research programs before the importance of such knowledge in the fields of antimissile and antisatellite defense was recognized, resulting in noteworthy advances.

RAUL RODRIGUEZ, U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va. Noting that "a substantial water supply for bases in the polar regions has always been a serious problem," the award synopsis of achievement credits Mr. Rodriguez with "the only revolutionary idea for solving this problem which has ever been developed for an icecap environment." The "Rodriguez Well" also is envisaged as a means of improving the cooling system for the icecap nuclear power reactor.

HORTON, BOWLES, WARREN, Diamond Ordnance Fuze Laboratory, Washington, D.C. Billy M. Horton, a GS-15 Physical Science Administrator, Dr. R. E. Bowles and Raymond W. Warren, both GS-14 Supervisory Mechanical Engineers, invented and developed a family of fluid amplifier controls. Described as "virtually impervious to extremes of vibration, heat, cold and humidity, these devices have no moving parts, are inexpensive, and can perform the same complicated functions as complex electronic circuits in computers and control systems."

DR. STANLEY M. LEVENSON, Walter Reed Army Institute of Research. As a GS-15 Supervisory Scientist, he established and directed a germfree animal research laboratory which has produced results leading to substantially expanded effort by the Army. He also is credited with developing "sterile tent" surgical techniques, and conducting experiments on the basic chemistry and enzyme activity of wound healing.

DR. GEORG A. HASS, U.S. Army Engineer Research and Development Laboratories, is recognized for his

(Continued on next page)

Huge Ball of Naked TNT Cast for Cratering Study

What is believed to be the world's largest single piece of uncased explosive—a sphere of TNT measuring 11½ feet in circumference and weighing 2,560 pounds—has been cast at Picatinny Arsenal, Dover, N.J.

The highly explosive sphere, 100 times the size of a regulation basketball, was cast in a 76-layer hollowed-out plywood mold. The explosive was not encased because it was fabricated for use in Army cratering studies in Alaska and container fragments would interfere with the study. (See April issue, page 14.)

Previously the largest explosive sphere, also manufactured at the Arsenal, weighed 1,000 pounds and had a 7-foot girth.

Broad Diversity of Effort Reflected in R&D Achievement Awards

(Continued from page 21)

work on various thin films used in coatings of satellites; antireflection coatings in advanced optical systems; and coatings to give very high reflectance in the vacuum ultraviolet, with applications to high altitude research, high temperature research in controlled fusion, wind tunnel studies, and shock phenomena research. Dr. Hass also is known for research which led to development of high precision, inexpensive plastic replica mirrors.

FRANK J. RIZZO, Quartermaster Research and Engineering Center, Natick, Mass. Mr. Rizzo, Chief of the Textile Dyeing Laboratory, played a prominent part in development of the color meter (described on page 19 of the May issue). This fully automated instrument, still under test, has recorded color differences numerically with a degree of accuracy never before attained. He has been a leader in the drive to standardize color measurements within the dye industry.

DR. JOHN S. CLEMENTS, Chemical Research and Development Laboratories, Army Chemical Center, Md. Work of Dr. Clements and his associates is credited with development of modern methods of resuscitation (manual and mechanical), and he is known as an expert in the field of respiratory physiology. As reported in the December issue, Dr. Clements also worked with a team of pediatricians at the University of California Medical Center, supported partially by the U.S. Public Health Service, to develop a method of overcoming a lung deficiency that annually snuffs out the lives of 25,000 newborn babies. The method is still under development.

WARREN W. BERNING, Ordnance Ballistics Research Laboratories. As a GS-14 Supervisory Physicist, Mr. Berning was cited for developing a method of direct measurement of ionospheric electron densities, including measurements to over 1,000 miles. He also conducted a rocket and balloon program to measure water vapor at high altitudes.

ALBERT P. LEVITT, Watertown Arsenal Laboratories, Watertown, Mass. Chief of the High Temperature Materials Branch, he "provided outstanding scientific and engineering leadership in establishing and directing the Arsenal's high-temperature materials research program." He helped to develop the Variable Parameter Rocket Engine. This solid propellant engine is reported capable of "rapidly, systematically and economically screening and evaluating promising rocket nozzle materials over a wide range of operating conditions."

AMORY H. WAITE, JR., U.S. Army Signal Research and Development Laboratories, Fort Monmouth, N.J. Because of his development of an electronic method of ice-depth measurement on icecaps, Army geophysicists are enabled to do a "better job of mapping the earth's surface below coverings of snow and ice than ever before." Also, "his work will prevent air crashes which might occur due to faulty altimeter indications," due to icecap conditions.

DR. WALTER S. McAFEE, U.S. Army Signal R&D Laboratories. He was cited in the award recommendation for results of his studies "vital to the national defense" as related to missile guidance systems and communications links. Dr. McAfee developed a mathematical expression that relates raw data from high altitude nuclear detonations with time varying phenomena.

DR. ARTHUR C. DAMASK, Frankford Arsenal, Philadelphia, Pa. According to the award commendation, he "developed experimental method and theories concerning the effects of nuclear radiation on nonfissionable alloys . . . applicable to any solid solution material where diffusion takes place by an atomic interchange. An equilibrium state was obtained after four hours which would have required 30,000 years to achieve under existing thermal treatments."

N. C. WHITE, H. S. WILLIAMS, Army Rocket and Guided Missile Agency, Redstone Arsenal, Huntsville, Ala. Working as a team, Niles C. White and Harry S. Williams, GS-15 and GS-14 chemists, respectively, were responsible for the formulation of a new solid propellant rocket fuel "with excellent temperature environmental capabilities," and for "relatively safe, inexpensive production techniques suitable for use in Army facilities presently on stand-by."

McKNIGHT, McCLUSKY, WIDENHOFER, Army Rocket and Guided Missile Agency. The commendation of William B. McKnight, GS-15 Physical Scientist, Lonnie N. McClusky, GS-14 Electronics Engineer, and Gene H. Widenhofer, GS-13 Mechanical Engineer, cites their teamwork in "development of a high speed thermal imager which produces moving images in the absence of any illumination . . . has great potential in the study of phenomena which are inherently dynamic in nature."

JAMES G. DRAKE, Picatinny Arsenal, Dover, N.J. As a GS-14 Mechanical Engineer, Mr. Drake "established concept, feasibility and development of a revolutionary inertial fuzing system for ballistic missile systems. This fuzing concept provides the Army with a system completely immune from countermeasures, as well as the first adaptation kit providing extreme reliability and safety while not requiring functional checkout in the field."

GEORGE K. ROBERTS, Signal Support Agency, White Sands Missile Range, N. Mex. Employed as a GS-13 Physicist, Roberts "proved that radiation in the millimeter wavelength does occur from missiles, providing a new basis for detecting and tracking missiles. He developed a scanning type spectrometer that permits rapid analysis of millimeter emission from missile flames."

JESS B. HUFF, Army Ballistic Missile Agency, Redstone Arsenal, Ala. Known nationally for his missiles achievements, this GS-15 Aeronautical Research Administrator was commended for "outstanding contributions to ballistic missile guidance technology since 1953, primarily in connection with the REDSTONE, JUPITER and PERSHING development programs."

JOHN L. McDANIEL, Army Ballistic Missile Agency. It is reported, unofficially and unconfirmed by the *Army Research and Development Newsmagazine*, that the LITTLE JOHN and HONEST JOHN rockets were named in recognition of the part that John L. McDaniel played. The synopsis of his achievement states that he made "significant contributions in scientific and engineering leadership since 1956, primarily in connection with the LITTLE JOHN and HONEST JOHN development programs."

WILLIAM A. McCOOL, White Sands Missile Range. In his work as a Physical Sciences Administrator, GS-15, Mr. McCool "developed the principles and demonstrated by simulation techniques the practicality of a Transfer Function Coefficient Analyzer which is needed for analysis of in-flight control components. Such a device will permit essential component characteristics to be derived directly from measured component input-output data in times sufficiently short to support real time test analysis."

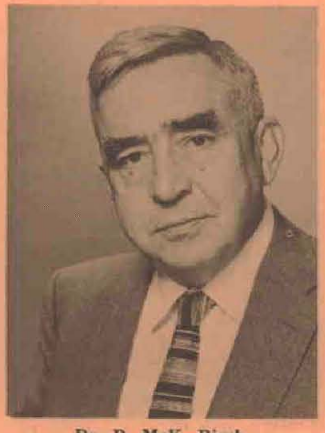
Success of the 27 scientists and engineers selected as winners of the first Army R&D Achievement Awards is backed up, in the opinion of General Trudeau, by several hundreds of others who are making important new contributions to accomplishment of overall R&D program objectives.

First Annual Army R&D Technical Achievement Award Winners

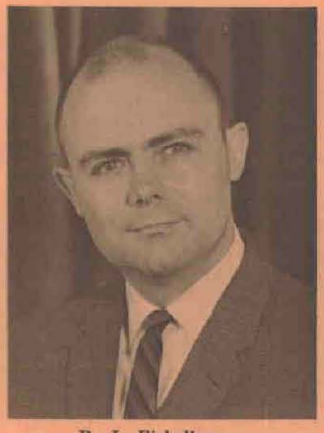
L. N. McClusky W. B. McKnight G. H. Widenhofer
ARGMA team developed high speed imager useful in absence of illumination.

P. W. Siglin
Signal R&D Laboratories

J. C. White
Hq. XVIII Airborne Corps, USCONARC



Dr. D. McK. Rioch
Walter Reed Army Inst. of Research



R. J. Eichelberger
Ordnance Ballistic Research Labs

Raul Rodriguez
Engineer R&D Laboratories

Dr. S. M. Levenson
Walter Reed Army Inst. of Research

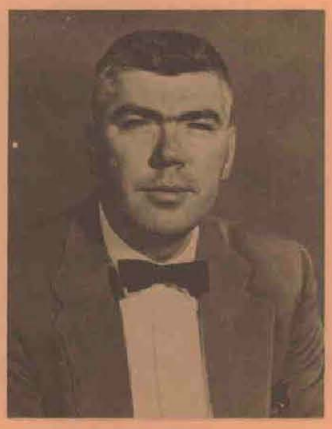
Dr. G. A. Hass
Engineer R&D Laboratories

F. J. Rizzo
Quartermaster R&E Center

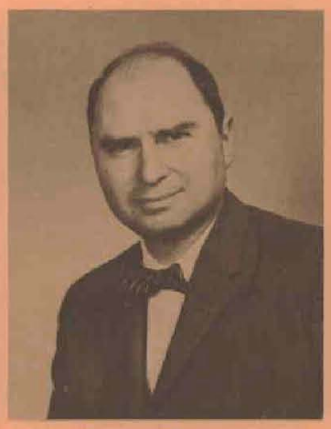
Dr. J. S. Clements
Chemical R&D Laboratories

First Annual Army R&D Technical Achievement Award Winners

(For story and additional pictures, turn to pages 1, 21, 22, 23)



W. W. Berning
Ordnance Ballistics Research Labs



A. P. Levitt
Watertown Arsenal Laboratories

A. H. Waite, Jr.
Signal R&D Laboratories

Dr. W. S. McAfee
Signal R&D Laboratories

Dr. A. C. Damask
Frankford Arsenal

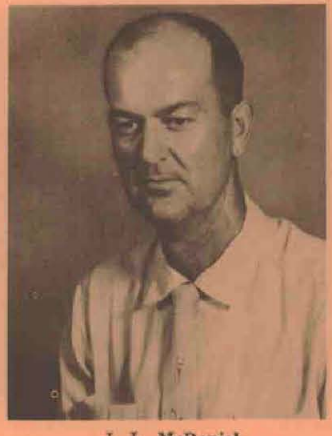
Niles C. White
ARGMA, Redstone Arsenal

H. S. Williams
ARGMA, Redstone Arsenal

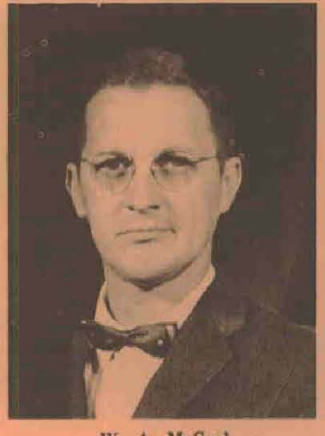
J. G. Drake
Picatinny Arsenal

G. K. Roberts
Signal Support Agency

J. B. Huff, Jr.
Army Ballistic Missile Agency



J. L. McDaniel
Army Ballistic Missile Agency



W. A. McCool
White Sands Missile Range