

MILITARY SCIENCE

Gas, Germs, May Decide Result of Nuclear War

➤ GAS AND GERM weapons, used in conjunction with nuclear weapons, could make the difference in determining who survives an all-out nuclear war, the U.S. Army's chief chemical officer, Maj. Gen. Marshall Stubbs, believes.

An enemy able to use chemical and biological warfare along with nuclear strikes is more apt to assume he can win a nuclear war, especially if the United States is unable to retaliate in kind, Gen. Stubbs told the Armed Forces Chemical Association in Washington, D.C.

Urging a U.S. build-up of a "balanced arsenal" that includes such weapons, he said we must use "every reasonable weapons system" to be prepared for any form of warfare.

"Chemical and biological agents exist which can be used strategically to cause casualties in an area the width of a continent," he pointed out. "Shelters which would protect the population from nuclear blast will not necessarily protect it from chemical or biological attack."

Gas and germs can be used flexibly in a measured and restrained response to varied military situations, he said. They can be used to pinpoint targets without "spill-over effects." They can be used to put aggressors out of action temporarily, or to kill "a large percentage of the target population."

They are effective search weapons against troops in the open or under cover. Results can be preset as immediate or delayed for a given time. Means of delivery range from intercontinental ballistic missiles to tiny insect carriers for some biological agents.

Gen. Stubbs said that in the Korean conflict, chemical mine fields, if they had been used instead of improvised flame mine fields, could probably have stopped any mass attack on foot. The flames that were used stopped only the first wave of attackers.

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TECHNOLOGY

Windmill Power Needed In Developing Areas

➤ SMALL, cheap, simple wind machines, preferably made from local materials, are needed to supply electricity in many of the world's developing countries, Edward W. Golding of the Electrical Research Association, London, told the United Nations Conference on New Sources of Energy in Rome.

A current stalemate in windpowered unit production was reported by Dr. Ulrich Hutter of the Polytechnic Institute, Stuttgart, German Federal Republic. He said industrialized countries are waiting for a bigger demand, while developing countries are waiting for production to start before they make plans to buy and use the machines.

Prof. Paul P. Santorini of the National Technical University of Greece said about

10,000 small, primitive windmills are used continuously to pump water in his country.

India plans to install 200 windmills in rural areas, and expects the benefits from electric power to more than justify the cost, said Prof. M. S. Thacker, director-general of India's Council of Scientific and Industrial Research.

In the United States, some 500,000 windmills used during the 1920's are now obsolete because many farms now need more power than windplants can supply, Dr. William B. Hillig, Schenectady, N.Y., solar energy consultant, reported.

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GENERAL SCIENCE

Science Confuses Public; Education Efforts Urged

➤ AMERICAN universities should take the lead in promoting two needed programs for public education in science, according to A. Hunter Dupree, history professor at the University of California, Berkeley.

The first should be aimed at "an audience that does not know what a scientist does or how he thinks or solves a problem."

The second would be for persons "already in touch with science and challenged by that very fact to understand it as a social activity"—growing army of science-affected technicians, administrators, military men and philosophers.

Universities lack the manpower to conduct the programs, but can decide on indirect methods using education techniques developed elsewhere. They will pay a high price if they do nothing, Prof. Dupree said. "Misunderstanding science and its role in civilization levies a toll on all mankind."

The public, he reports in *Science*, 134: 716, 1961, tends to confuse the end-product marvels of technology with actual scientific work. Not understanding science, they worship it as a messiah "while fearing its diabolical power."

He believes three major factors destroyed the 19th century faith, exemplified by public lectures and workmen's institutes on scientific topics, that science could be taught to the public.

First, specialization made science so complex that it was "far beyond the comprehension of any one mind, professional or lay."

Second, science became linked with technology and "lost its place as a part of genteel culture." Over-emphasis on technological products gave many citizens the unfortunate impression that Henry Ford stands high among the ranks of American scientists.

Third, there were no longer enough qualified scientists to "man all the posts in society which require an understanding of science." In World War II, for example, radar technology had to be taught to thousands who previously knew nothing about electronics.

These trends have kept the common man from understanding high-level science, at the same time involving more common men directly in scientific affairs, Prof. Dupree says.

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MEDICINE

Mystery Bone Disease Puzzles Physicians

➤ A 65-YEAR-OLD woman is cheerfully driving a car and continuing other activities with a left arm affected by a rare "bone-disappearing disease" that has remained a mystery to the medical profession for more than 100 years.

Except for legal requirements of the Drivers License Bureau, however, her physicians say she would discard the splint attachment that is fitted to her arm.

Drs. Joe M. Abell Jr. and Carl E. Badgley of the University of Michigan Medical Center, Ann Arbor, report in the *Journal of the American Medical Association*, 177: 771, 1961, that this case is similar to one in 1838 in which a young man with a virtually boneless arm could lift 100 pounds.

Only about 33 cases of this ailment, properly known as Gorham's Disease, have been reported in this country. It affects young people mainly, but the young man described in 1838 lived to die of pneumonia at the age of 70. All attempts to alter the course of the disease have failed.

Treatment has included vitamin D, parathyroid hormone, androgens (male hormones), calcium, adrenal extracts, vitamin B-12, amino acids, placental extracts and transfusions of placental blood. Radiation treatment has been recommended but has not proved to be of value.

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OCEANOGRAPHY

Gulf Stream Extension Seen in Plankton Find

➤ THE FINDING of warm-water species of plankton in the North Atlantic Ocean, northeast of the Newfoundland Grand Banks, has led to speculation that a "temporary extension" of the Gulf Stream current system may have brought them there.

V. Bainbridge of the Oceanographic Laboratory, Edinburgh, reports in *Nature*, 191:1216, 1961, that patches of warm-water zooplankton, minute oceanic animal life, were present in samplings taken in February, 1960, and March, 1961, at times when the area's surface temperatures were near their lowest.

The region is the meeting place of the cold water of the Labrador current from the north and the warmer waters of the North Atlantic current from the south. The theory is that the warm Gulf Stream current, flowing from the Gulf of Mexico along the United States coast to Nantucket Island, Massachusetts, and from there eastward, may be entering the area northeast of the Grand Banks at intervals not yet determined. Further plankton samplings and study are needed, Mr. Bainbridge said.

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CE FIELDS

ZOOLOGY

Privacy of Burrowing Animals Threatened

► TO KEEP TRACK of the underground activities of small burrowing animals, California scientists have developed an instrument that "tunes in" on them. The changing of the tune depicts the various movements.

Drs. J. Lee Kavanau and Kenneth S. Norris, zoologists at the University of California, Los Angeles, have devised a sand-filled compartment strung with copper wires. The wires, connected to a radio-frequency oscillator, "sing" a constant tune.

Movements of animals such as snakes and lizards through the box can then be traced by noting the change in tune created when they burrow near the sensitive wires. Preliminary experiments on snakes and lizards showed variable periods of activity separated by rests as long as 45 hours.

One small snake often rested near the sand's surface with only an inch of tail showing. The tail was probably used to test the outside temperature, the scientists report in *Science*, 134:730, 1961.

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MEDICINE

Highlights of Health and Medical News

► SKIN DISORDERS are estimated to make up from 10% to 15% of a doctor's everyday practice, the *Journal of the American Medical Association*, 177:778, 1961, reports as it begins a monthly section on cutaneous medicine.

The black widow spider is not the only one that can produce serious injury, four Dallas, Texas, physicians report in the *American Journal of Diseases of Children*, 102:395, 1961. Unidentified spiders are suspected of causing convulsions and other severe reactions in an eight-year-old boy and a six-year-old girl playing in a barn where there was a brown hairy spider, the *Loxosceles reclusus*, commonly found in Missouri and nearby states, including Texas.

Heart disease has become a leading cause of death in Puerto Rico according to a report by four San Juan doctors in the *Archives of Pathology*, 72:367, 1961. After age four, the aortas of 300 autopsied Puerto Ricans between two and 40 years of age showed fatty streaks, regardless of the cause of death.

Depression-prone persons are slower than more cheerful patients to recover from influenza. At Fort Detrick, Frederick, Md., as reported in the *Archives of Internal Medicine*, 108:393, 1961, 600 employees, mostly men, were given psychological tests, just before an outbreak of Asian flu. The investigators, who were all from Johns

Hopkins University Hospital, Baltimore, said the depressed state of patients previous to the illness determined the slowness with which they recovered.

The responsibility of the lay press in giving misleading medical information to the public is stressed in the leading editorial of the *Canadian Medical Association Journal*, 85:658, 1961. Reference is made to an article in *Maclean's* magazine of Aug. 26 entitled "Three Blood Transfusions Out of Four Are More Likely to Harm Than to Heal," which was condemned as unscientific.

Substituting office and hospital calls for home calls allows the present-day physician to see twice as many patients in a week as he did in 1930, according to the *American Medical Association*, 177:793, 1961.

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METEOROLOGY

Atomic Bombs Wrongly Blamed for Hurricanes

► PEOPLE are again blaming the weather, in this case, hurricanes, on atomic testing. People in the know are saying it is the bothersome meandering of upper atmosphere winds.

Jerome Namias, head of the U. S. Weather Bureau's extended forecast section, said that hurricanes are strongly influenced by the planetary winds, a globe-circling band blowing high in the atmosphere. The shifting of these winds has been responsible for much of the weather conditions that led the hurricanes to the U. S. coast.

A "dramatic change" developed at the end of August and early September when the westerly winds began meandering in wide loops. Easterly winds began picking up in the tropics, and a high pressure system also developed. The expected increased warming of the oceans from the summer sun then set the stage for the prevailing weather conditions that spawned hurricanes Carla, Debbie, and Esther.

"The reason for the dramatic change is not too clear," Mr. Namias said. He believes that the area where tropical storms are born is largely determined by the world-wide air flow patterns. Meandering planetary winds form ridges and troughs that act as passageways for the hurricanes. The wave patterns or loops help or hinder storm development, depending on their position.

The warning that the winds were set to meander came in the East during late August when the generally cool weather was replaced by a heat wave. Colorado residents noted the abrupt change by an unusual snowfall.

The reversal in weather happened when the ridges and troughs of the winds switched places over the Rocky Mountains and the eastern seaboard. Prior to the change, conditions were not conducive to forming tropical storms due to the presence of cooler air much farther south than usual, Mr. Namias emphasized.

The change in the weather pattern began before the Russians resumed nuclear testing, Mr. Namias pointed out.

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GENERAL SCIENCE

Searches for Science Talented in High Schools

► HUNDREDS of high school seniors who are outstandingly talented in science have been selected to receive honors and college scholarships by State Science Talent Searches in 39 states and the District of Columbia.

Sponsored by state academies of science, universities and colleges, museums and scholarship foundations, the state searches are conducted by special arrangement with Science Clubs of America and *SCIENCE SERVICE* and are held in conjunction with the national Science Talent Search for the Westinghouse Science Scholarships and Awards.

A Science Clubs of America summary of State Science Talent Search activities for 1960-61 is now available. A total of 504 students were selected for state honors and thousands of dollars in scholarships. Additional scholarships were awarded by colleges and universities on the basis of the recommendations of the State Science Talent Search committees.

Winning students were given awards of books, subscriptions to scientific journals, scholarships and opportunities to attend scientific meetings, tour laboratories and confer with professional scientists. The awards were made at banquets, special meetings of state academies of science, programs on university campuses and at state science fairs.

Many state directors reported plans for expanded programs and awards for the 1962 state searches.

Celebrating its 21st anniversary this year, the annual Science Talent Search for the Westinghouse Science Scholarships and Awards is conducted by Science Clubs of America, an activity of *SCIENCE SERVICE*, and is supported by the Westinghouse Educational Foundation.

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BIOCHEMISTRY

Finds Formation Steps For Primitive Chemical

► THE STEPS by which the chemical, adenine, could have been formed on the primitive earth have been found.

Dr. J. Oro of the University of Houston, Houston, Texas, reports in *Nature*, 191:1193, 1961, that he had produced adenine from hydrogen cyanide, ammonia and water by a complex process of six reactions.

Adenine, an amino acid basic to life on earth, is necessary for the structure and function of genes, for energy metabolism and for many other biochemical functions. Adenine is believed to play an important part in the transfer of genetic information.

Hydrogen cyanide, ammonia and water are believed by many scientists to have been present on earth at its early stages and over millions of years to have combined into the kind of organization required for the origin of life.

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