RADIO

Radar Developments To Be Told at Meeting

➤ DISCOVERIES in radar, radio wave propagation, and new radio apparatus developed during the war will be reported at meetings to be attended by radio scientists May 2 to 4 in Washington, D. C.

At these first postwar meetings of the American Section of the International Scientific Radio Union and the Washington Section of the Institute of Radio Engineers one session will be devoted to technical aspects of radar, while a day's time will be spent on the way in which radio waves travel in the upper atmosphere. The meetings will be under the chairmanship of Dr. J. H. Dellinger, chief of the National Bureau of Standards' Radio Section, who headed the Inter-Service Radio Propagation Laboratories during the war.

Science News Letter, April 27, 1946

BIOCHEMISTRY

Plant Growth Regulators In Biological Warfare

➤ A HINT that 2,4-D or some close relatives of this new weed killer might have been used as agents of biological warfare appears in a report in *Science* (April 19).

During the war extensive tests on the use of these substances, called plant growth regulators, were conducted by the Special Projects Division of the Chemical Warfare Service at Camp Detrick, Md., the report states. Such a statement, coming from this division where other biological warfare research was conducted, obviously implies that the use of these substances for destruction of enemy crops was at least considered.

The report gives further evidence of the peacetime benefits to be expected from biological and chemical warfare studies as well as of the wide range of scientific defenses needed in war.

Over 1,000 compounds were prepared and tested, the Special Projects Division now reports. The tests included effects on germinating seeds and on the growing plants when the compounds were applied to the leaves. Studies of methods of using the compounds showed that a spray was the best.

Originally the scientists thought they might find compounds that were specific for certain plant crops. The advantages of this in warfare are obvious. Against an enemy whose staple food crop was rice, a rice-specific compound, if found, would be used. Against other nations a wheat-specific or a rye-specific compound might be useful.

Compound-crop specificity was found only to a limited extent, the report states. In general, the compounds were more poisonous to broadleaf plants than to grasses.

One group of compounds was found which was more poisonous to cereals or grain crops such as rice, wheat, and rye, than to broadleaf plants. British scientists also found this true. The compounds are carbamic acid derivatives.

Only one compound specific for broadleaf plants was found. This one and its derivatives were very damaging to Irish potatoes. It is 2, 4, 5-trichlorophenoxyacetic acid, or 2, 4, 5-T for short.

Plant growth regulators or hormones, such as 2,4-D and 2,4,5-T act by stimulating abnormal growth followed by death of the plant. They are effective in very minute quantities.

Results reported so far, remarkable as they have been, are not the whole story but "only the beginning," Dr. E. M. Hildebrand, of the Food Machinery Corp., Dunedin, Fla., states in another report on the weed killers appearing in the same issue of *Science*.

Science News Letter, April 27, 1946

CHEMISTRY

Cousin of DDT Reported As More Effective

➤ DFDT, a chemical cousin of DDT, promises to be even more effective in man's chemical warfare against insects, Prof. H. L. Bradlow of the University of Kansas reported at the American Chemical Society meeting. In this compound, whose full chemical name is difluor-diphenyl-trichloro-ethane, fluorine atoms are substituted for two of the five chlorine atoms of DDT.

In identical tests on caged insects, DDT killed 90% to 95%, while DFDT killed them all. It also lasts longer when used as a soil insecticide. It is less toxic to warm-blooded animals—an advantage when used about the home and in the barn.

First information about DFDT was obtained from scattered German references. Before long, Prof. Bradlow had succeeded in producing it in his own laboratory. At present, he stated, it is somewhat more expensive than DDT.

"By further modification of the basic DDT structure," he added, "we are hopeful of producing even more potent compounds."

Science News Letter, April 27, 1946

IN SCIEN

GENETICS

Heredity Units Act as Models for New Molecules

➤ WHEN WE SPEAK of a boy as "an absolute copy of his father," we have scientific warrant for doing so. For the genes, or invisible hereditary units, which he received from his father have acted as models for the chemical construction of every molecule of living substance in his body, as a pattern or templet serves as the model for a mechanic turning out identical piece after piece on his lathe or workbench.

This picture of the function of genes was presented to the American Philosophical Society by Prof. G. W. Beadle of Stanford University, in the course of the annual Penrose Memorial Lecture.

Studies of the sub-units in the construction of living things taught us that the one thing that really distinguishes them from non-living things is their power of self-duplication, Prof. Beadle stated. First we learned that cells can produce new cells, each a close copy of the original; though it may later become modified for special functions differing from that of its parent cell. Then we learned that units much smaller than cells—genes and virus particles—possess similar powers of self-duplication.

In the growth of the organism from its original single cell, genes apparently serve as copies for most if not all protein or protein-containing molecules, Prof. Beadle told his audience. Such molecules may later become regular structural units in the new organism's body, or they may turn into such specialized things as the enzymes that chemically control such important functions as respiration and nutrition, or the antigens that combat bacterial poisoning. Since enzymes, antigens and similar key compounds influence the whole course of life, the genes, operating through them, exercise a mighty control over all organisms, from minute one-celled forms up to whales and redwood trees.

"There appear to be no obvious reasons," said Prof. Beadle in conclusion, "for believing that genes have any function other than that of serving as templets for the construction of complex protein molecules."

Science News Letter, April 27, 1946

CE FIELDS

NUTRITION

B_6 Needed to Utilize Protein for Good Health

➤ WITHOUT an adequate supply of pyridoxine, also known as vitamin B_6, the animal body cannot utilize proteins which are indispensable to good health, University of California experiments show.

The studies show that a high protein diet, which is often prescribed to build the body's resistance to disease, may be useless unless it accompanies a high intake of pyridoxine to enable the body to assimilate the protein.

In experiments with animals it has been shown that tryptophane, an indispensable amino acid found in protein, is not utilized by the body but is excreted when there is either a severe or moderate deficiency of the vitamin.

An extreme deficiency of pyridoxine is known to cause convulsions and severe anemia in animals. Feeding of tryptophane to the severely deficient animals aggravated these symptoms and also produced nausea and muscular weakness.

Even in moderately deficient animals the same symptoms were produced, though after a longer period of time. Animals fed an adequate supply of pyridoxine were able to assimilate tryptophane, and showed no ill effects.

The experiments were conducted by Dr. Samuel Lepkovsky, Dr. Agnes Fay Morgan, and Helen E. Axelrod.

Science News Letter, April 27, 1946

PHYSICS

Peacetime Atomic Plant Is Obvious Development

➤ MOST SCIENTISTS not in the confidence of the Manhattan Engineer (Gen. Groves and the atomic bomb outfit) must have assumed that under the cloak of secrecy an experimental plant for the peacetime development of atomic energy had been underway for many months.

It is nine months since the first atomic bomb was exploded and the Smyth report was written. That should have been long enough to give birth to the rather obvious pilot plant that Gen. Groves is reported to have told Sen. McKellar (D. Tenn.), is only now being begun.

Power production in competition with fuels and water power is the least important application of atomic energy.

The atomic pile planned at Oak Ridge, Tenn., can be a factory for radioactive atom varieties, called isotopes, that, used as tracers in chemical, biological and medical experiments, may very well explain the way the green leaf uses sunshine, the cause of cancer and a host of other diseases.

Use of these radioelements has been likened in importance to the discovery of the microscope.

Most obvious application of atomic power is to the propulsion of large naval craft. The Navy would be willing to pay almost any price for a ship that would not have to refuel for many months, and large ships could afford to carry the heavy weight of the protective materials blanking out powerful radiations given off by the atom splitting in atomic power plants. It is surprising that the Navy is not hard at work on this possibility. Even if the Manhattan District is in the Army it should be willing to cooperate.

Less secrecy would allow the public to know whether the immense possibilities of atomic energy are being developed as fast as they could be.

Science News Letter, April 27, 1946

RADIO

Peacetime Uses for Panoramic Screen

➤ A PANORAMIC SCREEN that shows all radio signals received on a wave band at one time will find many important peacetime uses after playing an important role in the war, according to its inventor, Dr. Marcel Wallace, president of the Panoramic Radio Corporation in New York.

Dr. Wallace said the panoramic technique can be used for all-weather flying and ship handling, prevention of sea and air collisions and a multitude of other navigational and communication applications.

He described panoramic technique as being diametrically opposed to normal radio reception. Instead of blocking out all but one signal, the panoramic technique scans an entire wave band and reports all signals simultaneously on the panoramic screen, he explained.

Invented before the war, the new system of radio reception was used by the armed forces to jam enemy radar, monitor enemy broadcasts and locate off-frequency transmissions, the inventor disclosed.

Science News Letter, April 27, 1946

PHYSICS

X-ray for Cancer Without Radiation Sickness

➤ EFFECTIVE penetrating X-ray treatments for cancer and other ills without the patient suffering radiation sickness is possible through the use of a 20,000,000 volt betatron "atom smasher", Dr. D. W. Kerst, professor of physics of the University of Illinois, declared in delivering at the Ohio State University the first of his national Sigma Xi lectures.

With ordinary X-ray machines the distribution of the radiation is different, whereas Dr. Kerst declared with cross-firing with betatron-induced X-rays it would not be necessary to curtail an X-ray treatment because of radiation sickness produced in a patient.

Dr. Kerst, who is inventor of the betatron, said construction of an atom-smashing betatron of 250,000,000 electron volts would make possible the production of pairs of mesons, atomic particles created hitherto only by cosmic rays from outer space.

A 100,000,000 electron volt betatron at Schenectady, N. Y., has already been used to produce artificially single mesons, but Dr. Kerst explained that if both positive and negative mesons in pairs could be manufactured there would be important opportunities of further exploration of atomic mysteries.

Development of the betatron during the war, Dr. Kerst explained, was concentrated upon types that could take radiographic photographs through more than a foot thickness of steel in order to detect flaws in armor plate and large machinery parts. Using a fast technique, pictures have been taken through 20 inches of steel in 18 minues.

Science News Letter, April 27, 1946

CHEMISTRY

Liquid Oxygen Useful At High Altitudes

➤ LIQUID OXYGEN, part of the fuel system of the Nazis' V-2 rocket-bombs, was proposed for use in airplanes by Dr. H. Grayson-Smith of the Universitv of Toronto at the American Chemical Society. But it is for the use of the passenger at high altitudes rather than for the engines. Bottles of the liquid breath of life, together with apparatus for restoring it to a gaseous state, can be substituted for the thick-walled tanks of compressed oxygen now in use, with considerable savings in weight, he declared.

Science News Letter, April 27, 1946