

CHEMISTRY

Canadians Reveal How To Make RDX Explosive

► HOW to make RDX, the powerful explosive being used in bazookas in Korea, was announced by the Canadian National Research Council.

The process for cheap mass production of this once-secret chemical was developed during the last war by Canadian and U. S. scientists. RDX has figured in spy trials in both U. S. and Canada.

This devastating successor to TNT was first produced by the Germans during World War I. They could not find a way to mass produce it cheaply so its military significance was slight.

Now, however, it is in quantity production. In use, it is mixed with TNT. Chemically, RDX is cyclo-trimethylene-trinitramine, one of the host of chemicals that can be made from coal tar, natural gas or petroleum.

In the process described by the Canadians, RDX is made by mixing concentrated nitric acid and hexamine. RDX is far more violent than TNT, having at least 50% more power. Because it is very dangerous to handle, it is mixed with TNT and waxes.

Drs. C. A. Winkler, A. H. Vroom and M. Kirsch did the work on the reaction rates for making RDX while at McGill University during the period from 1942 to 1944.

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CHEMISTRY

Sulfur and Gas Saved From Petroleum Field

► SULFUR and natural gas, obtained as by-products in petroleum production in the new oil field in Worland, Wyo., are not wasted as formerly but are salvaged and are expected to yield a profit of \$2,500,000 a year.

Natural gas produced with the crude oil in that area has a high hydrogen sulfide content which makes it extremely poisonous. The sulfide content is the highest yet found in any oil field gases. A similar gas at Elk Basin, Wyo., has an average content of hydrogen sulfide of 20%, but this Worland field has a 33% sulfide content.

Just completed between Worland and Baker, Mont., is a 13-inch pipe line approximately 340 miles long. Also constructed is a sulfur extraction plant, a gasoline plant and a compressor station. Funds for the construction, some \$15,000,000, were provided by the Pure Oil Company, The Texas Gulf Sulphur Company and the Montana and Wyoming Pipe Line Company.

Today the gas is first put through the sulfur extraction and casinghead gasoline plants where an average of 300 tons of pure sulfur and 30,000 gallons of liquid products are obtained each day. Some 15,000,000

cubic feet of practically sulfur-free gas are obtained which is suitable for domestic uses. However, before distribution it is mixed with sweet gas from an upper gas formation.

At first the poisonous gas and recoverable natural gasoline in this field were conducted by pipe high in the air and burned. When hydrogen sulfide is burned it forms sulfur dioxide, a bleaching agent heavier than air. On damp days it settled to the ground in blankets of fog, doing much damage to crops. The new pipe line makes it possible to gather the production of the fields into a central plant large enough to warrant the cost of salvaging both sulfur and gas.

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ORNITHOLOGY

Wrong-Way Pigeons Spotted from Airplane

► HOMING pigeons can be fooled into taking the wrong direction, the American Association for the Advancement of Science was told by Dr. Harold B. Hitchcock, biologist at Middlebury, Vt., College.

He spied upon flocks of these birds from an airplane. When his homing pigeons were trained to find their way back to their loft by being taken always in the same direction, most of them flew off in that direction even when they were taken in an opposite direction.

Some of the birds seemed to be quicker than the rest to discover they had been fooled, but even the birds that seemed to know that they were not going straight home had great difficulty in making themselves break away from the flock. Sometimes it took a year or more of flying for the birds to sense the proper way home.

Science News Letter, January 13, 1951

PSYCHIATRY

Some People Wear Heart on the Skin

► SOME people wear their hearts on their skin. Persistent itching and scratching are signs of this, Dr. Phillip F. Durham Seitz of Indianapolis told members of the American Academy of Dermatology and Syphilology.

These people are considered by their associates to be unfriendly, "cold fish." Psychiatric study of 120 of such sufferers from itching and scratching showed that they are highly sensitive and easily hurt.

Their cold, composed air is a front. The scratching seems to serve a double function. It releases the muscular tension created by suppressed rage. It gratifies the need for love through cutaneous erotic pleasure.

When the patient gets the idea that he can express his anger to the doctor without being criticized for it, the first step has been taken on his way to psychiatric rehabilitation.

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PALEONTOLOGY

Bones in Back Yard Are of Extinct Sloth

► IT WAS only a few bones that the youngster found in a New Jersey highway cut. But 14-year-old James Ruhle could be thankful that he did not live 100,000 years ago, when bears the size of elephants could have roamed his back yard.

The bones he found were those of a 15-foot-long bear-like mammal, the long-extinct North American ground sloth.

Dr. H. G. Richards of Philadelphia's Academy of Natural Sciences said it was the first evidence that the great sloth, distantly related to present-day South American sloths, once lived in what is now New Jersey. Similar bones have been found in a cave on the Schuylkill River in Pennsylvania, but never before in New Jersey.

The fossils were found by the boy in the new right-of-way of the New Jersey Turnpike near Moorestown, N. J. Their location showed that the great prehistoric creature lived in the Pleistocene era, when New Jersey's climate was warmer than it is today.

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MEDICINE

Dramamine for Nausea After Anesthetics

► THE NAUSEA and vomiting which are unpleasant and sometimes serious after-effects of anesthetics given for surgical operations can be prevented and relieved by dramamine, the modern motion sickness remedy and preventive.

A report, said to be the first, of successful use of the drug for this purpose is made by Drs. Carl J. Rudolph, D. Davis Park and Charles Hamilton of South Bend, Ind. (JOURNAL, AMERICAN MEDICAL ASSOCIATION Dec. 9).

First patient to whom these doctors gave the drug for this purpose was a man so sick the night of an operation that he was found lying on his abdomen, holding on to the bed. He said his head was going round so that he felt he must "hold on for dear life."

Within about one half-hour after dramamine he had entirely recovered.

The South Bend doctors now give a dose by mouth one half-hour before operation as preventive of nausea and vomiting. In cases in which patients have not been given this prophylactic dose and get sick after the operation, a suspension of the chemical in salt solution is given rectally.

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CE FIELDS

GENERAL SCIENCE

Detlev W. Bronk New A. A. S. President

► WITH the election to the presidency of the American Association for the Advancement of Science, Dr. Detlev W. Bronk becomes the American scientist holding the largest number of important scientific offices upon the American scientific scene.

Dr. Bronk, who will serve as president of this organization of 40,000 members during 1952, is already president of the National Academy of Sciences, vice chairman of the National Commission on UNESCO, member of the National Science Foundation, as well as filling many less important governmental and non-governmental offices. He is president of Johns Hopkins University in Baltimore.

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CHEMISTRY

Flue Dust Possible Source of Germanium

► THE RELATIVELY little known but increasingly important metal called germanium has been experimentally recovered from deposits in smoke stacks in England by the research laboratories of General Electric Company. Its growing importance is due to its use in electronics.

It has been known for 20 years that some of the coal found in England contains germanium. When coal is burned in industrial plants some two-thirds of the germanium in it is expelled as a germanium sulfide or oxide. These compounds form a deposit in the flues. It is from these deposits that the germanium is recovered.

Flue dusts from gas works may contain from 0.5% to 1% germanium. In the recovery process the compounds in which it exists are converted to germanium tetrachloride by treatment with hydrochloric acid. By further chemical processes, the tetrachloride is purified and the germanium obtained. Processes have now been developed which produce an economical yield. Supplies of high-purity germanium metal and germanium oxide are now available in England without imports.

It has been estimated that if only 100,000,000 tons of the coal used in England each year contains germanium in the proportions found in samples from various coal fields, about 2,000 tons could be recovered each year as a by-product of coal combustion.

While there are many important uses of germanium, one of its newest applications is due to its being a semi-conductor of elec-

tricity. It is now being used as a rectifier to convert alternating current to direct current. Some day it may replace some of the vacuum tubes for the purpose in radio equipment.

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VETERINARY MEDICINE

Sheep Are Dying Of Rabbit Fever

► SHEEP are dying on western ranges from a wildlife disease known as "rabbit fever."

A deadly germ producing an ailment technically called tularemia, is being carried to sheep by wood ticks which live on sagebrush, Drs. William L. Jellison and Glen M. Kohls of the U. S. Public Health Service's Rocky Mountain Spotted Fever Laboratory report. (JOURNAL, AMERICAN VETERINARY MEDICAL ASSOCIATION.)

The disease can kill or leave sheep without their woolen coats. One out of every ten sheep in one infected flock died. Others either lost their hair completely or produced wool of low quality.

Rabbit fever can be contracted by humans as well as by many forms of wildlife. Hunters often get it while dressing infected rabbits.

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MILITARY SCIENCE

Bombs Burst in Air with Sonic Proximity Fuse

► BOMBS dropped from airplanes on enemy targets will explode high enough in the air so that their death-dealing fragments will catch men in fox-holes and narrow trenches if equipped with sonic proximity fuses. For this device a patent was issued by the government among the 986 awards of the past week.

Bombs that detonate upon contact with the earth may do relatively little damage to men in holes and trenches. They scatter their debris over the surface doing damage to men and objects on the surface but only part of the fragments drop into the excavations. This sound-triggered bomb can be adjusted to explode at any predetermined height so that its fragments will fall into widely scattered fox-holes.

This proximity fuse is activated by sound waves of a particular frequency which are the results of waves sent out by equipment in the bomb and reflected back by the earth. The intensity of the reflected sound received by the detector will increase as the bomb gets nearer to the earth. The detector can be set to respond to an intensity which will be reached when the bomb has reached a desired altitude.

Patent 2,536,327 was issued on this fuse to William A. Tolson, Princeton, N. J. It has been assigned to Radio Corporation of America.

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PHYSIOLOGY

New Blood Factor May Aid A-Bomb Protection

► CLUES to the existence of a new body chemical, probably a hormone, that stimulates blood production have been discovered in the search for protection against atom bomb radiation.

The new substance, called a "factor", is apparently secreted by the spleen and to some extent by the appendix, liver and intestines. It was reported by Dr. Leon O. Jacobson of the University of Chicago at the meeting of the American Association for the Advancement of Science in Cleveland.

Earlier experiments by Dr. Jacobson and associates showed that mice, rats, guinea pigs and rabbits could withstand massive doses of X-rays if their spleens were shielded. Survival apparently depended on ability of the shielded spleen to stimulate blood formation in other tissues of the body. Damage to blood-forming organs is one characteristic effect of atom bomb radiations and X-rays.

Shielding the spleen and certain other organs helps survival, Dr. Jacobson's latest studies show, because of the new "factor" that stimulates blood formation. The factor can be produced by spleens even when they have been given sub-lethal doses of radiation. And the factor aids survival of animals even when given two days after exposure to radiation.

If the factor can be isolated, identified chemically and perhaps produced outside the body, it might prove valuable both to radiation victims and anemia patients.

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PHYSIOLOGY

Stomach Reacts To Stress Two Ways

► HUMAN STOMACHS follow two patterns of reaction to emotional and psychological stress, Dr. Stewart Wolf of the New York Hospital reported at the meeting of the American Medical Association in Cleveland, Ohio.

One is a "riddance" pattern, with digestion stopping and the person becoming nauseated and vomiting.

The other is the opposite pattern of excessive stomach function in which the person behaves as if he is about to be fed. This excessive stomach function has two serious dangers. One is a lowering of the pain response with the result that unsuspected damage may occur. The other is an increased fragility of the lining membrane of the stomach, paving the way for erosion and ulcer.

Dr. Wolf's report was based on direct observations of the activities inside the stomach and intestines of five patients who had been operated on for ulcers.

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