

MEDICINE

Glaucoma Weapon

Chemical that failed as war gas may help those with the blinding eye disease and may lead to better understanding of myasthenia gravis.

► A CHEMICAL that failed as a war gas nevertheless held the spotlight at the meetings of the Federation of American Societies for Experimental Biology in Atlantic City. The reason: Trials on patients show that it may help those with the blinding eye disease, glaucoma, and may lead to better understanding of and treatment for the muscle weakness disease, myasthenia gravis, and perhaps other ailments involving nerve and muscle chemistry.

In more than a score of patients with glaucoma, who had not been helped by physostigmine or pilocarpine, the usual medicines for this disease, the war gas chemical kept tension in the eyes normal and prevented further loss of visual fields, Dr. Irving H. Leopold and Dr. Julius H. Comroe, Jr., of the University of Pennsylvania School of Medicine, reported.

The chemical is di-isopropyl fluorophosphate, called DFP for short. Early in the war British chemists explored its action because its effect in contracting the pupils of the eyes led them to hope it might interfere with enemy marksmanship. This proved a false lead, but when scientists in our own Chemical Warfare Service at Edgewood Arsenal studied DFP they learned facts about its effects on body chemistry which led them to ask doctors at certain medical centers to try its value for patients.

Some of the 76 glaucoma-affected eyes were not helped by DFP or any other medicine. This occurred in 16 instances. In another 24, DFP gave the same results as the two medicines commonly used for this eye ailment. But 36 eyes were helped by DFP when other medicines failed.

DFP has a much longer lasting action than pilocarpine or physostigmine. These drugs have to be dropped into the eyes three to six times every day, but in only 10 cases was it necessary to use DFP more than once a day. Once a day was enough for the majority, while in one case DFP was needed only every 10 days.

Undesired effects reported for DFP were blurring of eyesight, brow and eye-ache, spasm of accommodation and peri-

corneal vasodilation.

DFP is not the final answer for myasthenia gravis patients, it appears from the report of its trial in seven patients by Drs. Julius H. Comroe, Jr., John Todd, and George Gammon and Lt. George B. Koelle and Maj. Alfred Gilman. These scientists, at the University of Pennsylvania and Edgewood Arsenal, also examined the effects of DFP on the blood, liver and kidneys of 20 normal persons. No changes in liver, kidney or blood-forming functions were found, the most frequent undesired effects being on the stomach and intestines.

DFP relieved the weakness of the myasthenia gravis patients for longer periods than did neostigmine, the usual drug for this ailment, but never to the same degree. Muscle power was only partially improved by DFP, but markedly increased by neostigmine.

With DFP's effects on body chemistry as a guide, however, scientists may be able to develop a more effective chemical than any yet known for treatment of myasthenia gravis.

In studies of its effects on the body generally, DFP was given by injection into the muscles or by capsules that were swallowed. When dropped into the eyes for glaucoma treatment, however, very little if any of it is absorbed by the body.

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MEDICINE

Electric Knife Now Used For Chest Surgery

► SURGEONS may now use the superior electric knife for the first time in chest operations as a result of a new anesthesia technique developed at the University of California Medical School. A general improvement in such operations is expected from the development.

In the new technique curare is used to paralyze the respiratory muscles and nitrous oxide to put the patient to sleep. This eliminates the use of the explosive anesthetics which are ordinarily used and which preclude electric cautery.

The doctors explained that it is necessary in a chest operation to use an anes-



ON LOAN—A Coast Guardsman examines an old-style lighthouse lens. Schools, museums, and maritime societies may borrow this lens and many other old lenses from the Coast Guard. Because of the change from oil to electricity, other scientific improvements and modern designing, these old lenses, still in excellent condition, have been retired from active service.

thetic which is potent enough not only to put the patient to sleep but to paralyze the respiratory muscles so that breathing can be controlled by gentle pressure on a breathing bag attached to the mouth.

The explosive anesthetics, such as ether and cyclopropane, have been the only ones potent enough to accomplish both these purposes. The electric knife would cause an explosion on contact with these gases within the lung.

A combination of nitrous oxide and curare is desirable because no bad after effects have been noted. The gas is potent enough barely to put the patient to sleep, and the curare is strong enough for paralysis of the respiratory muscles.

The doctors have found the technique safe to use over the long periods of time—six hours is not unusual—required for a chest operation. It is especially advantageous when young doctors are operating; it puts them at their ease, they can work without pressure. Sixty-eight chest operations have been performed using the technique.

The use of an electric knife in chest surgery is desirable because it congeals the blood quickly around incisions and prevents excessive bleeding in vital areas of the body.

"The cautery has been used within the chest cavity in every case," the doctors reported recently. "It has proven easy

to produce apnea (paralysis of respiratory muscles) and control breathing, and no difficulty has been encountered on any case in persuading the patient to resume spontaneous respiration.

"The patient's general condition during the operation and postoperative course has been excellent in all cases."

Science News Letter, March 23, 1946

ENGINEERING

Icy Waters Patrolled

Radar, loran and aviation will play part in North Atlantic iceberg patrol now being re-established as international service.

See Front Cover

➤ WAR-DEVELOPED radar and loran, as well as aviation, will for the first time play important parts in patrolling the North Atlantic for icebergs in shipping lanes, as shown on the cover of this SCIENCE NEWS LETTER, in the re-established International Ice Patrol, the U. S. Coast Guard announces. The service was discontinued Dec. 22, 1941, because of the disruption of normal maritime commerce, although a careful estimate of North Atlantic ice conditions was maintained throughout the war for the benefit of naval vessels and convoys.

The danger season in the North Atlantic from icebergs in the waters patrolled by the U. S. Coast Guard extends each year from March or April to July. The patrol area covers a region about the size of the state of Pennsylvania in the general region of the Grand Banks of Newfoundland, a section blanketed in fog during a large part of the time. The fog is aggravated by the meeting of the Gulf Stream and the Labrador current. Through the region passes the world's heaviest ocean traffic, Coast Guard officials state.

A constant patrol of the region will be maintained by aircraft and especially equipped cutters. Airplanes of the B-24 type will be used by the aerial watch. The 254-foot cutters are powerful vessels, equipped for rescue at sea and for ice-breaking, and having other essential mechanical and electrical apparatus. Both planes and cutters are equipped with radar and loran.

The radar will assist in locating icebergs during low visibility. Loran will give the exact location of a berg as soon as discovered. This is important. In the past, patrol vessels have been fogbound

for days. Their position had to be determined by dead-reckoning and radio direction finder bearings. With the use of loran, the patrol vessel's position can be determined within approximately one mile and warning given of the position of an iceberg sighted. Loran will also afford a more efficient means of tracking bergs in their daily movements.

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MEDICINE

Great Germ Killers To Be Useless Soon

➤ PENICILLIN and streptomycin will be useless as remedies against disease within five to ten years, Dr. Hans Molitor, of the Merck Institute for Therapeutic Research, predicted at the meeting in Atlantic City of the Federation of American Societies for Experimental Biology.

New antibiotics will then be needed for patients with pneumonia, streptococcus infections and the like, unless some chemist can synthesize penicillin and then change it enough to make it continually useful.

The reason the two great antibiotics we now have are destined for the scrap heap of worn-out remedies in a few years is that germs are developing resistance to these chemicals. Doctors may have to give a thousand times as much of these antibiotics and give it faster to get the patient well, Dr. Molitor predicted.

One thing that can be done to stave off the day of uselessness for penicillin and streptomycin is to refrain from giving them to any patient unless really necessary. Use of penicillin in lozenges, salves, tablets and the like from which the patient gets only small quantities of the mold chemical or use in diseases it

does not remedy, such as influenza, will hasten the day of penicillin's uselessness.

When penicillin or streptomycin are used, they should be given in large enough doses to kill the disease germs in a few days, before they can get used to the antibiotic and grow resistant to it.

A new idea of dosage of drugs has developed through penicillin and streptomycin, Dr. Molitor said. Formerly a doctor might look up in a textbook the average dose of a medicine for a certain disease and give that to his patient. With the antibiotics he first must determine what germ is causing the trouble and then adjust the dose in each case to give a sufficient concentration of the antibiotic in the patient's blood to kill the germs.

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MEDICINE

Prevention of Water On Brain by Diet Hinted

➤ THE TRAGEDY of a baby born with hydrocephalus, or water on the brain as it is popularly known, may be prevented in future by diet, is the hint in studies reported by Dr. R. L. Richardson and Dr. A. G. Hogan, of the University of Missouri, at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City.

Infants born with this condition can be recognized by their very large heads. Usually they are retarded mentally and few survive to adulthood.

The cause of the condition, the Missouri scientists report, may be an inadequate diet of the mothers before the babies are born. The vitamin or other food chemical, lack of which might lead to this condition, is not known but apparently is contained in liver.

When an eluate of a fuller's earth absorbate of a liver extract was added to the diet of 54 female rats, a total of 1,020 young survived until they were weaned and several thousand young were reared in the stock colony with no sign of hydrocephalus, the scientists reported. A group of 230 female rats fed the same diet but lacking the liver material had 1,756 young which survived at the weaning age of 28 days, but there were in addition 30 which developed hydrocephalus between the ages of 10 and 24 days. Of these 30, only two survived as long as 28 days.

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Flue-cured tobacco leaf accounts for more than half the American crop and is used mainly in cigarettes.