

ENTOMOLOGY

Nerve Gases Vs. Insects

The only defense against parathion is a gas mask. This insect killer belongs to a family of chemicals commonly known as the nerve gases.

► WITH parathion, an insect killer now being used on U. S. fields and orchards, men on the big spray rigs have only two choices: Wear a gas mask or die.

There is good reason for the bold-face, urgent warning carried on each drum of this compound and of other new chemicals widely available to American farmers.

For while military authorities have kept "Top Secret" stamped across a weapon developed by Germany in World War II, that same weapon has been in use in this country for at least two years against insect pests. The weapon is a family of chemicals with an ominous nickname—the nerve gases.

Some of the effects of parathion on warm-blooded animals, and that includes man, were described recently by witnesses at a Food and Drug Administration hearing.

Now in their seventh month, the hearings are part of an extensive study by the Food and Drug Administration of crop control chemicals used on today's truck farms and orchards.

Since January, more than 5,000 pages of testimony and over 1,000 exhibits have been presented. All of the early testimony was limited to proving one already well-established premise: Chemicals are vital to modern farming; without them, fruit and vegetable growers would fight a losing battle.

The most important question, however—is how toxic are these chemicals to man—is now being covered with testimony on such potent insecticides, weed killers, and fungicides as parathion.

Inhale too much parathion or absorb too much through your skin. In quick succession your muscles begin to twitch, you find it hard to breathe, your nose and mouth begin to water. Then come gasping, diarrhea, convulsions, unconsciousness and death.

This has happened to more than a dozen farm workers and chemical packers in the last two years, Dr. John P. Frawley of the Food and Drug Administration told Science Service. Seven men died last year from parathion poisoning. Several have already died this farming season.

Even more toxic than parathion are two other insecticides still to be taken up in the protracted Federal hearings on allowable residues of chemicals used on U. S. fruits and vegetables. These are TEPP and HETP, or in full chemical designation, tetraethyl pyrophosphate and hexaethyl tetraphosphate.

Gas masks are essential in handling

these chemicals, members of a deadly family called the organic phosphates. Rubber gloves, boots, hat and raincoat are advised, for the poisons can be absorbed easily through the skin.

Why use these dangerous substances at all? Because they are among the most effective insecticides yet developed. Fruits and vegetables on which parathion can be used to cut down insect losses include apples, pears, plums, peaches, beans, beets, cabbage, carrots, corn, onions, peas, potatoes and tomatoes.

Parathion kills mites, moths, aphids, the Mexican bean beetle, armyworm, corn borer, corn earworm, thrips, Colorado potato beetle, red spider, grasshoppers and the Japanese beetle.

MEDICINE

Mechanical Kidney

► MODERN machines that save lives instead of destroying them are the mechanical, or artificial, kidneys now being made in several styles. The artificial kidney takes over when the patient's own kidneys stop functioning temporarily.

Only in extremely heavy doses would parathion residue on fruits and vegetables reaching market prove dangerous to consumers, experts from the Food and Drug Administration and industrial laboratories testified at the legal tolerance hearings.

Dr. Frawley said long-term Government experiments showed that two-tenths of a milligram of parathion per thousand grams of a rat's body weight produced no ill effects. In man, he said, one-fourth of that amount or about 3.5 milligrams for a 150-pound human being would be well within all safety limits.

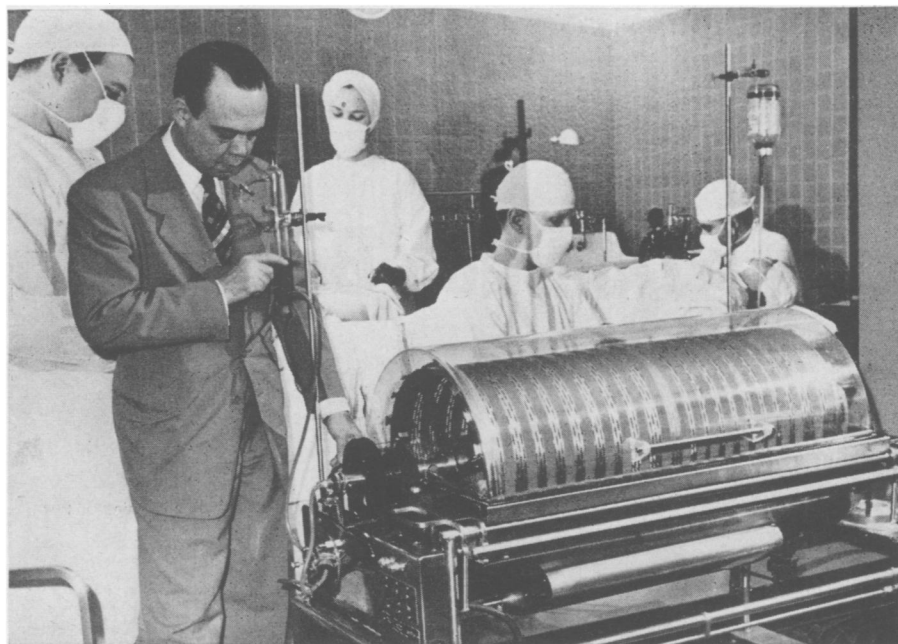
Dr. Clinton H. Thienes, head of the department of pharmacology at the University of Southern California School of Medicine, had a higher estimate. Man can take 50 milligrams (about 2/1000 of an ounce) of parathion in a day without suffering any adverse effects, he said.

Object of the Food and Drug Administration hearings is to round up such basic data as this for a new set of Federal regulations. The regulations will set the permissible amount of chemical residue on fruits and vegetables to be sold in interstate commerce.

Science News Letter, July 22, 1950

When the kidneys are not functioning, waste products—especially those containing nitrogen—get into the blood and cause poisoning. This condition is known as uremia.

Back in 1914, three American scientists



STAND-IN FOR KIDNEY—Blood from the patient's arm runs through the cellophane tubing wound around the drum. Used by patients suffering from uremia and pregnancy complications, it also helps those less acutely ill.

had the idea that if the blood could be dialyzed through a fine-pored membrane which would sieve out the waste products, it could then be returned to the body and the patient might survive. They tried this on animals, but had difficulty in keeping the blood from clotting while it was out of the body.

Discovery and development of heparin as an effective anti-blood clotting agent and of cellophane membranes, made possible the construction of practical artificial kidneys for human use.

Blood from the patient's arm is run through cellophane tubing wound around a big drum. The drum revolves in a bath of special salt solution. After its bath, the blood is returned to the patient's body through another vein.

At the same time that the impurities are being removed from the blood, beneficial chemicals can be put into it from the fluid in the bath, the chemicals being selected in accordance with the particular patient's needs. Heparin keeps the blood from clotting and the temperature can be kept the same as that of the body.

Dr. W. J. Kolff pioneered the development of this type of artificial kidney during the war at the Municipal Hospital at Kampen, Holland. After the war he came to this country and is now a staff member of the Cleveland Clinic, Cleveland, Ohio.

The artificial kidney shown in the picture is a Kolff type, but other styles have been devised. One of these uses flat cellophane sheets between longitudinally corrugated plates.

Patients with acute uremia in kidney disease, in the pregnancy complication, eclampsia, in shock conditions and in some types of poisoning, may be saved by the artificial kidney which keeps them alive while their own kidneys are recovering from the acute condition.

But other, less acutely ill patients may

also be helped by this machine. And the apparatus may prove important for research leading to new knowledge of body processes.

Science News Letter, July 22, 1950

ASTRONOMY

Unseen Distant Galaxy May Prove Relativity Theory

➤ A SLIGHTLY fuzzy object surrounded by an almost-perfect halo has been discovered in the constellation Serpens by Arthur Hoag, of Harvard College Observatory.

He proposed to the American Astronomical Society in Bloomington, Ind., that in lieu of other explanation it may be a "gravitational lens," caused by the curvature of space around the large total mass of a galaxy of stars.

According to Einstein's theory of relativity, light will be deviated in the vicinity of massive bodies, and at eclipses of the sun it has been found that such deviation is observable in the light of stars passing near the sun. If a very distant galaxy of millions of stars happens to lie exactly along the line of our sight to an even more distant similar galaxy, the gravitational action of the first galaxy could conceivably cause the light of the second to be curved around it on all sides. Thus, although we could not see the one galaxy behind the other, its light would reach us as a "halo" around the nearer object.

The new object, found on a Schmidt camera photograph of 75 minutes exposure at Harvard Observatory, is of the 17th magnitude, and it has an almost perfect halo around it, 17 seconds of arc in radius. At first, this might appear to be one of the so-called planetary nebulae, which are rings of gas surrounding hot blue stars. The color of the nucleus of the new object is red, however, and the spectrum of the

halo is continuous, not consisting of bright emission lines as it would if it were a planetary nebula.

The object is far from the plane of the Milky Way, where no planetaries have been observed, but where galaxies abound. Its nucleus is fuzzy, not starlike, and its appearance without the halo would cause it to be classified as a galaxy of the spheroidal type, with a total mass equal to that of 800 thousand million suns.

Science News Letter, July 22, 1950

SCIENCE NEWS LETTER

VOL. 58 JULY 22, 1950 No. 4

45,200 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1950, by Science Service, Inc. Reproduction of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STATE 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, Princeton University; Karl Lark-Horowitz, Purdue University; Kirtley F. Mather, Harvard University. Nominated by the National Academy of Sciences: Harlow Shapley, Harvard College Observatory; R. A. Millikan, California Institute of Technology; L. A. Maynard, Cornell University. Nominated by the National Research Council: Ross G. Harrison, Yale University; Alexander Wetmore, Secretary, Smithsonian Institution; Rene J. Dubos, Rockefeller Institute for Medical Research. Nominated by the Journalistic Profession: A. H. Kirchofer, Buffalo Evening News; Neil H. Swanson, Baltimore Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. Nominated by the E. W. Scripps Estate: H. L. Smithton, E. W. Scripps Trust; Frank R. Ford, Evansville Press; Charles E. Scripps, Scripps Howard Newspapers.

Officers—President: Harlow Shapley; Vice President and chairman of Executive Committee: Alexander Wetmore; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, A. C. Monahan, Marjorie Van de Water, Ann Ewing, Wadsworth Likely, Margaret Rallings, Sam Matthews. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. In London: J. G. Feinberg.

Question Box

ASTRONOMY

Which planet can boast of the most moons? p. 58.

CHEMISTRY

What is the bee's new competition in the wax-making business? p. 50.

ENTOMOLOGY

How fast can a fly fly when startled? p. 56.

Photographs: Cover, Department of Defense; p. 53, Hamilton-Wright; p. 55, New York Zoological Society.

What is the well-dressed farmer, out to kill insects, wearing? p. 51.

GENERAL SCIENCE

How can wrecks make for safety? p. 56.

ICHTHYOLOGY

What "fish food" may we be eating in the future? p. 54.

ZOOLOGY

What animal fasts for posterity? p. 62.