

## BACTERIOLOGY

# Humidity Kills Germs

**Air-borne disease germs could be checked in schools, offices and theaters by a relative humidity of 50%, which seems to be lethal.**

► A RELATIVE humidity of 50% swiftly kills disease germs in the air.

This discovery by Edward W. Dunklin and Dr. Theodore T. Puck of the University of Chicago may give us a new, simple way of stopping the spread of diseases like pneumonia, colds, 'flu and others whose germs spread through the air.

It may also explain why such diseases spread rapidly at some seasons and not at others. It might give scientific evidence for the phrase, "pneumonia weather," used by our grandmothers.

The discovery was made in studies with Type I pneumonia germs, staphylococci and streptococci, the latter the cause of serious sore throats, scarlet fever and other ailments. Whether viruses and other disease germs are similarly affected has not yet been determined. But using humidity, in schools, offices, theaters and the like, to check the spread of disease would be so simple that it would be worth while even if only partly beneficial, as the scientists point out.

The humidifying would have to be done exactly. A 50% relative humidity is rapidly lethal to the germs studied but they can survive a long time at higher and lower relative humidities.

At 50% relative humidity the pneumonia germs the scientists sprayed into an experimental air chamber were all dead in less than 10 minutes. But at relative humidities of 80% and 20% many germs survived for over two hours.

The 50% relative humidity that is deadly to germs would not be uncomfortable for humans indoors. Climatologists have found that whether the air is wet, dry or humid makes very little difference in comfort so long as the temperature ranges between 50 and 68 degrees Fahrenheit. That upper temperature level and the approximately 72 degrees Fahrenheit temperature of the studies with germs are fairly close to each other and to the usual indoor temperatures. Temperatures in the fifties and nineties make a difference in the germ-killing effect of humidity.

The 50% relative humidity kills the germs by dehydrating them to the point

where they become most vulnerable to the action of sodium chloride, the ordinary salt we use for seasoning food. When the germs were suspended in distilled water, instead of broth, and then sprayed into the air, they did not die as fast at 50% relative humidity. But

when sprayed from a salt solution, or from human saliva, which is the natural way they get into the air, they were rapidly killed, just as when sprayed from broth.

Measurement of the rate of settling of droplets showed that the disappearance of the germs from the air at 50% relative humidity was a true killing process and not a sign of collision of germs with the sides of the air chamber or with each other.

Details of the experiment are reported in the *Journal of Experimental Medicine* (Feb. 1).

*Science News Letter, February 28, 1948*

## NUCLEAR PHYSICS

# Attack Atomic Secrets

► ROUND, hollow "pill boxes" are at the heart of a new, powerful atom-smasher which has been constructed at Yale University, New Haven, Conn.

The pill boxes are three to seven inches long and weigh approximately 75 pounds. Connected up into what is called a cavity resonator, with high powered amplifiers, the pill boxes will generate an electrical voltage equal to approximately 2,000,000 volts each.

This system, known as a linear accelerator, has already attained 1,000,000 volts. Electrons, light-weight negatively charged atomic particles, are built up to the speed of light to smash the nuclei of atoms in the new effort to unlock atomic secrets.

Yale's linear accelerator was constructed under the direction of Howard L. Schultz, assistant professor of physics, in collaboration with Edward R. Ber-



**NEW ATOM-SMASHING ACCELERATOR**—"Pill boxes," on the average generating an electrical voltage equal to approximately two million volts each, are at the heart of a new linear accelerator at Yale. It was constructed under the direction of Howard L. Schultz, assistant professor of physics, shown in the picture explaining the system to Carol G. Montigomery, associate professor of physics.

inger, assistant professor of physics, and Carol G. Montgomery, associate professor of physics. The scientists are planning to use the new accelerator to study four major problems:

1. A study of new products produced by nuclear transmutations which convert one element into another.

2. How a fast electron behaves near the nucleus of an atom, and how an electron gets out of the nucleus.

3. Production of powerful X-rays by stopping fast electrons suddenly.

4. How are fast electrons absorbed in matter.

*Science News Letter, February 28, 1948*

#### AERONAUTICS

## Guide V-2 Rocket's Flight

➤ A NAZI-BUILT V-2 rocket with an American-made control system is the first of the much-heralded guided missiles.

The V-2 was successfully maneuvered in flight for the first time at the White Sands, N. Mex., Proving Ground. Signals radioed from the ground sent the rocket to the right and left and up and down.

Control is achieved by a device which receives the radio signals and activates the gyroscope which steers the rocket.

As developed thus far, the guided V-2 is still a far cry from the guided missiles which have been proclaimed to be the weapons of the future. But this flight marked the first known success at controlling any portion of a rocket flight from the ground. Months ago, the same system was sent on a "dry run" flight, in which radio signals were received and

sent back by the equipment in the rocket. On that flight, the rocket was not guided in its path, but the radio system was tested. The present flight was made possible by the successful testing which assured that the radio signals would be received by the equipment aboard the rocket.

Rocket experts of the Armed Forces emphasize that the V-2 flight was only a first step toward a guided missile. But they point out that the simple maneuvers are an important control development. The supersonic-speed rocket cannot be made to perform the dives and turns of a small airplane.

Whether or not the controlled V-2 will stand up as the first American guided missile is a problem for historians. Cloaked in secrecy are other missiles, some of which may be guided.

*Science News Letter, February 28, 1948*

#### NUCLEAR PHYSICS

## A. E. C. Offers Fellowships

➤ THE urgent need for men and women equipped to fight radiation danger and to man expanding atomic energy programs has led the U. S. Atomic Energy Commission to establish fellowships for training qualified persons in atomic medicine and biology.

Selection of candidates and administration of the program will be carried out by the National Research Council, with the A. E. C. financing the program, establishing operating policies and training goals. For the first year of the program approximately \$1,000,000 has been budgeted.

The program is expected to continue for about five years. About 75 fellows each year will be physicians and doctors of philosophy in the biological sciences. Their fellowships will be for two years. In addition, the program calls for 100 fellows who are graduates of colleges or universities but without advanced de-

grees, to take one year of training in health physics.

Because the A. E. C. wants its fellows spread widely over the country, selection of universities for fellowship training will depend in part on geographical location. Fellows will have a certain amount of latitude, however, in selection of institutions for their training.

The A. E. C. will have plenty of jobs in its own installations for the men and women after their training, Dr. Shields Warren, A. E. C. interim director for medicine and biology, stated. However, fellows will not have to agree to work for the Commission.

Health and safety of atomic energy workers can be maintained, he declared, with the trained personnel for this work now on hand. But expansion of the atomic energy program will require more of these specially trained workers. And a considerable number of research

fields which should be explored cannot be at present because of the shortage of personnel.

Very important for the future world food situation, Dr. Warren and his associate, Dr. John Z. Bowers, pointed out, is the matter of using radioactive substances for improved utilization of now scarce fertilizer materials. Preliminary investigations indicate, for example, that it may not be as necessary to lime soil as has been believed. Further studies, with tagged atoms, of the uptake by plants of different types of substances may lead to better uses of fertilizers.

Finding how long an insecticide spray will hang onto a leaf may be determined

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