

PUBLIC HEALTH

Summer-Long Fly Control

Insect-free areas for the summer foreseen through use of chemical "extenders," added to present insecticides to increase their effective killing times.

➤ BY NEXT summer you may be able to spray your patio, picnic ground or campsite once and be rid of flies, mosquitoes and other insects for the entire season.

Chemical "extenders" added to our present insecticides, such as DDT, aldrin and lindane, will do the job, U.S. Department of Agriculture scientists hope.

When one of these extenders, methyl ethyl ketone, was used as a solvent for DDT, spray residues on foliage killed flies for 60 days and longer, compared to less than 15 days when the DDT was in an oil solution.

The fly-killing ability of aldrin and lindane was stepped up from less than 10 days under outdoor conditions to give "nearly perfect fly control" for more than 102 days. That would take care of June, July, August and the first week of September.

The scientists who developed the insecticide extender idea are W. N. Sullivan, entomologist, and Irvine Hornstein, chemist, working under the direction of R. C. Roark of the Agricultural Research Center at Beltsville, Md.

The new sprays while being tested were put on pine and spruce trees. At intervals twigs from the sprayed trees were taken into the laboratory and tested against flies.

During the test period, begun in the fall, daily temperatures varied from as high as 80 degrees Fahrenheit to as low as 23 degrees. More than eight and a half inches of rain and snow fell during the period, showing that the new sprays will not wash off in summer rains.

Department officials explain how the extenders work as follows:

Applied as an oil-base spray, DDT does not form long-lasting residues on foliage because the oil carrying the DDT penetrates into the leaf. However, when a highly volatile solvent such as methyl ethyl ketone is substituted for the oil in DDT sprays, it quickly vaporizes when sprayed so that only a residue of DDT remains on the foliage surface.

With aldrin and lindane sprays, using methyl ethyl ketone in place of oil only partially solves the problem of making these foliage sprays long-lived. Unlike DDT, these two insecticides are relatively volatile materials themselves. The scientists slowed down their rate of evaporation by adding a chlorinated terphenyl, trade-named Arochlor, to the spray solution. These insecticides are soluble in the non-volatile chlorinated terphenyls and, as a result, the vapor pressure of the insecticide is lowered.

When methyl ethyl ketone insecticide sprays were applied with either a power

sprayer or mist blower, very concentrated solutions containing approximately 50% by weight of the insecticide extender were used. The methyl ethyl ketone began to evaporate almost as soon as the spray left the nozzle. As the material evaporated the spray droplets became small insecticidal pellets, averaging between 50 and 100 microns (about 1/500 to 1/250 of an inch) in diameter, which carried for relatively long distances.

The pellets adhered strongly to such target surfaces as foliage, forming a uniform deposit over the leaf or branch, but not penetrating or otherwise damaging it.

Flies were used as convenient "guinea pigs" for the tests, but it is hoped that the effect would be the same on other insect pests.

Science News Letter, August 7, 1954

PHYSICS

Swedish Scientists Make Element 100

➤ SWEDISH SCIENTISTS have manufactured the heaviest element in the universe, number 100, by bombardment in a

cyclotron, it is revealed in the *Physical Review* (July 15).

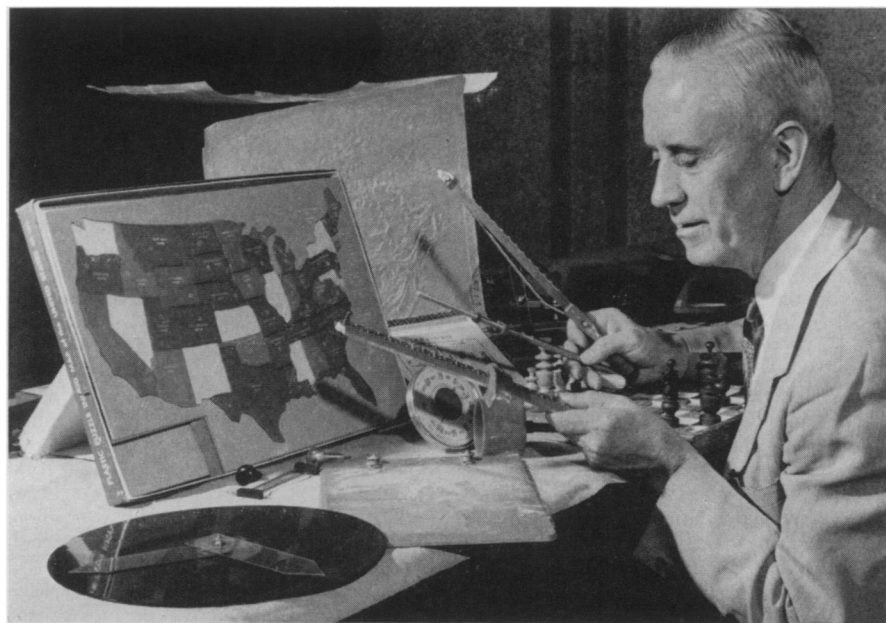
This is believed to be the first time that scientists outside the United States have succeeded in making an element heavier than uranium, number 92, which is the heaviest occurring naturally. Announcement of the discovery of element 100 by a University of California group led by Nobelist Glenn T. Seaborg was made last February, but the date of their work was not given. (See SNL, March 6, p. 147.)

The Swedish scientists report that their "first positive results were obtained" on Feb. 19. They made an isotope of the element 100 by bombarding the A-bomb element, uranium, with charged oxygen particles in a cyclotron. The isotope has a half life of about half an hour, Drs. Hugo Atterling, Wilhelm Forsling, Lennart W. Holm, Lars Melander and Bjorn Astrom of the Nobel Institute of Physics, Stockholm, report.

Use of oxygen as a bombarding particle in cyclotrons is a recent process. Other heavy particles, such as carbon and nitrogen, have also been used in place of hydrogen and helium. (See SNL, Feb. 20, p. 115.)

The Swedish scientists made the element 100 with oxygen ions having energies of 180,000,000 electron volts. The uranium was forced to take on, in one step, the eight protons necessary to change it into the new element number 100, in the institute's 225-centimeter cyclotron. It was identified by its alpha activity, about 20 alpha disintegrations of 7,700,000 electron volts usually being found. The probable mass number, they state, is 250.

Science News Letter, August 7, 1954



BLIND-TEACHING DEVICES—Shown here are some of the special appliances used in teaching the blind. Dr. P. C. Potts of the American Foundation for the Blind, New York, is looking over a carpenter's rule, microgauge, measuring cup, thermometer, slide rule, chess set, protractor and some of the other devices especially developed for this purpose.