

ENTOMOLOGY

DDT Conditioning Theory

Development of resistance to DDT in mosquitoes is likened to morphine addiction in humans. Old DDT deposits are probably the source of the chemical causing resistance.

► DEVELOPMENT of resistance to DDT in house flies and mosquitoes comes about in much the same way as morphine addiction in humans.

This explanation of a new theory of DDT "conditioning" as the cause for resistance to the insecticide was presented by Dr. R. W. Fay of the Communicable Disease Center, U. S. Public Health Service, at the meeting of the Entomological Society of America in Tampa, Fla. Dr. Fay is stationed at the Center's Technical Development Division at Savannah, Ga.

DDT resistance may result, Dr. Fay believes, because the insects, by coming in contact with amounts of the chemical too small to kill, become conditioned so that they can withstand increasingly large doses. Comparing the situation to morphine addiction, he said:

"At first a person can tolerate only a small amount of morphine. But ever larger amounts are necessary for a 'kick.' Eventually, a person can take 100 times his first dose, and still he won't feel it."

Animals receiving small amounts of DDT are able to handle the poison by storing it in the fat tissues of the body,

he said. In insects, the DDT might be transmitted in the fat content of the eggs maturing in the bodies of the females.

Old DDT deposits are probably the source of the chemical making insects resistant, Dr. Fay speculated.

Reports from Egypt, Greece, Italy, Sweden and Denmark as well as the United States show that house flies have shown resistance to DDT. Two species of pest mosquitoes in this country, one in Florida, the other in California, have also been reported DDT-resistant. One species of Anopheles mosquito, the malaria carrier, is not being controlled to the same degree in South America as in former years, Dr. Fay reported.

"In contrast to these observations," he said, "we have Anopheles species which are still showing no resistance to DDT after periods of four and five years of control programs. Programs involving the control of fleas, blow flies, stable flies and horn flies are still showing good results."

If adult flies of field strains are held in the laboratory, free from any insecticidal deposits, Dr. Fay said, resistance disappears completely in four to 10 generations.

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MEDICINE

Vitamin B₁₂ Aids Growth

The growth of undernourished children is stimulated by daily doses of vitamin B₁₂. This vitamin has been used chiefly before for its good effects in anemia and sprue.

► A NEW way to make puny, undernourished children grow and gain has been discovered by scientists at the Children's Fresh Air Camp and Hospital in Cleveland, Ohio.

The method consists in feeding them daily doses of a relatively new vitamin, B₁₂. Heretofore this vitamin has been known and used chiefly for its good effects in pernicious anemia and sprue, although originally it was discovered as a chemical that promoted growth in bacteria.

"Dramatic" responses by five of 11 children fed the vitamin are reported by the Cleveland scientists in the journal, *SCIENCE* (Dec. 16). The scientists are Drs. Norman C. Wetzel, Warren C. Fargo, Isabel H. Smith and Josephine Helikson.

The vitamin was fed every morning to six boys and five girls between the ages of five and 12. They were all under care

at the institution for varying degrees of malnutrition and growth failure. In addition to the vitamin doses, all the children were continued on whatever programs of rest, exercise and diet they had been following in efforts to improve their growth and physique.

Before getting the vitamin, the children had showed no characteristic or even suggestive signs in hair, skin, eyes, mouth or nervous system that could be ascribed to vitamin lack, and all were presumably getting all the vitamins needed for normal growth.

After getting the vitamin the children not only showed a change in growth rate but also had more physical vigor. They were more alert and behaved better. And they demanded second helpings, whereas before they had had poor appetites.

The "most dramatic general effects" were

shown by a boy with severe allergic bronchitis, the doctors report. For a year he had been awakened regularly at night by severe asthmatic attacks. His daytime wheezing was so bad it cut down his desire for food and even his time for eating it.

After being put on the vitamin treatment, his symptoms "simply vanished during the first week, to the surprise of every attendant, lay or professional," the scientists report.

They suggest further investigation on "what possible connections" there may be between vitamin B₁₂ and allergies.

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BIOCHEMISTRY

Radioactive Alcohol Is Tried on Rats

► RADIOACTIVE alcohol is the new research tool being used by scientists at the Scripps Metabolic Clinic, La Jolla, Calif., to learn more about how your body handles the alcohol in your Christmas eggnog, cocktails or other alcoholic drinks.

A large part, 75%, of the alcohol is burned to carbon dioxide within five hours. Almost all of it, 90%, is burned in 10 hours, they find.

The studies were made on rats. Some were normal rats and others had been "habituated" to alcohol in their diet and might therefore be considered something like some humans who have developed a type of tolerance to alcohol.

The habituated rats, however, did not burn alcohol any faster than the teetotalers among the animals. This suggests that tolerance is a matter of decreased nerve sensitivity rather than increased ability to dispose of alcohol.

Surprising to the scientists was the finding that the kidneys have a high capacity for oxidizing, or burning, alcohol. Heretofore it has been generally concluded that the kidney did not take part in the first stages of alcohol burning, and that this went on almost exclusively in the liver. Rats may be different from other animals in this regard, the scientists suggest, but they think it more likely that the kidney's alcohol-burning activity has been overlooked. The rat has about seven times as much liver tissue as kidney and this would give the rat liver a four-to-eight-fold advantage over the kidney in ability to burn alcohol.

The radioactive alcohol was made by fermentation with baker's yeast of corn syrup containing radioactive carbon 14. When the alcohol was burned in the rat's body to carbon dioxide, the radioactive carbon 14 in the carbon dioxide gave the scientists an accurate measure of the rate of burning of the alcohol.

The studies are reported by Dr. Grant R. Bartlett and Harry N. Barnett of the Scripps Metabolic Clinic in the *QUARTERLY JOURNAL OF ALCOHOL STUDIES* (Dec.).

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