environmental sciences

CHLORINATED PESTICIDES

Effects noted on mammals

Dr. William B. Deichmann, University of Miami pharmacologist, reports that studies he has done on mammalian effects of chlorinated pesticides show "reason for grave concern for the possible adverse effects on fertility, gestation, viability and lactation." The effects may occur when human blood and fat levels of certain pesticides reach levels reported for individuals who work directly with these compounds, and even for the general population.

Three experiments were carried out. In one, female mice fed various pesticides at levels similar to ingestion by industrial pesticides workers produced less milk and their offspring did not survive as long as the offspring of control groups.

In another, rats were fed aldrin and dieldrin in doses of 20, 30 and 50 parts per million in their food. They had a proportionately reduced incidence of mammary and lymphatic tumors, which are hormone dependent.

In a third experiment, male and female dogs treated with DDT and aldrin produced offspring only 16 percent of which survived, as contrasted with 84 percent survival in control dogs. Fat and blood levels of DDT in the dogs were comparable to those in humans who had been industrially exposed, although levels found in some humans from the general population also produced higher infant mortality in the dogs.

The mechanism of the damage is through effects on hormones, says Dr. Deichmann, who reported the findings to the Canadian Food and Drug Directorate.

AIR POLLUTION

Monoxide and alcohol

Rats exposed to carbon monoxide levels comparable to those on urban freeways develop a preference for alcohol over other beverages.

Studies by Dr. Robert S. Pogrund at the University of California in Los Angeles also revealed that exposure of young rats to 200 parts per million of carbon monoxide slowed growth and spontaneous activity. The harmful effects of CO were enhanced when positive ions were combined with it.

Young rats were offered a normal diet and a choice of four fluids: water, glucose solution, saccharine solution and alcohol. A control group breathing ordinary room air preferred water, but the group breathing CO with positive ions preferred alcohol.

POLUTION MONITORING

Infrared scanner to be tested

Most forms of water pollution are reflected in temperature changes. Biodegradation of sewage, for example, releases heat energy. One scientist has suggested that a universal language to express the adverse effects of pollution could be in terms of energy flows and consumption (SN: 7/11, p. 36).

North American Rockwell Corp. of Seal Beach, Calif., was recently awarded a study contract by the State of California to make infrared photographs of portions of San Francisco Bay from the air. The study will indicate whether such techniques are applicable to pollution monitoring. The proposed system is capable of measuring temperature differences as little as one-tenth of a degree.

Preliminary tests in Los Angeles Harbor have indicated that infrared scanning can be useful in detecting pollution; the sewage outfalls, for example, are clearly visible.

DETERGENTS

Surfactants affect marine life

Detergents have been strongly implicated as the source of nutrients causing eutrophication in lakes and rivers (SN: 4/4, p. 17). The guilty substance is the builder, which in most detergents contains nutrient polyphosphates. The active ingredient, the surfactant, has received less attention.

E. J. Perkins of the Marine Laboratory in Garelochhead, Scotland, reports that anionic and non-ionic surfactants have a variety of effects on marine organisms. Anionic surfactants are common in household detergents; non-ionic surfactants are used mainly in industrial detergents.

Perkins experimented with gastropod and lamellibranch molluscs, particularly suited for the studies because they have nonliving shells that can be notched to measure growth rates.

Single 24-hour doses of oil emulsifiers and non-ionic detergents resulted in delayed mortality and growth inhibition in the winkle, *Littorina littorea,* and other animals.

Exposure to as little as 1/30,000th of the median tolerance dose of certain surfactants affected predator-prey relationships, making the rough periwinkle more susceptible to attack by the green shore crab, for example.

PCB's

Monsanto reduces sales

Scientists have recently become concerned over contamination of the environment by polychlorinated biphenyls (PCB's), industrial compounds which have much in common with chlorinated pesticides. The PCB's are persistent poisons, they are attracted to fatty tissues of organisms and they are concentrated up the food chain. (SN: 3/28, p. 321).

The Monsanto Co. of St. Louis, a major manufacture of PCB's, announced in a letter to Rep. William F. Ryan (D-N.Y.) that it would no longer sell PCB's for use as a water-resistant plasticizer or hydraulic fluid.

Monsanto will continue to sell PCB's for use as a lubricant in transformers and for paints and adhesives, the company said.

Ryan had complained in April that the PCB's are serious environmental pollutants, and he asked the Food and Drug Administration to take action against them.

The company refuses to make public a list of all the products in which the PCB's are used, and Ryan says he is not entirely satisfied by the company's action.

It is thought that PCB's are transmitted in the environment mainly in the air; friction, burning or evaporation apparently releases them from products.