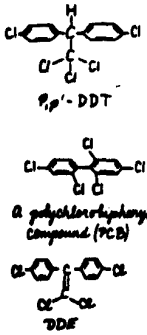
RESEARCH REPORTER

BIRDS AND POLYCHLORINATED BIPHENYLS

Polychlorinated biphenyls are a group of chlorinated hydrocarbons having biological effects similar to those of DDT. Also like DDT, they are persistent and widespread in the environment and are the subject of controversy.

Polychlorinated biphenyls, also known as PCB's, are colorless viscous liquids that can withstand high temperatures. Commercial PCB's contain 42 to 60% chlorine and exist in as many as 50 isomeric forms. Industrially, they are used as heat exchangers in electrical equipment, particularly transformers, and as plasticizers in plastics.



In this country, the Monsanto Chemical Co. is the only producer. Since 1960, the company has produced some 353,00 tons of PCB. The chemicals are produced also in Europe, Japan, and the USSR but the amounts are unknown.

Early last year, about 50,000 turkeys in Minnesota and 55,000 chickens in North Carolina and thousands of eggs were ordered destroyed by the Food and Drug Administration because they contained high levels of PCB. The Food and Drug Administration has established guidelines of 5 ppm (parts per million) in poultry and fish.

Last November, George R. Harvey, Woods Hole Oceanographic Institution, said that PCB levels ranging from 1 to 100 ppb (parts per billion) were found in nearly all plants and animals taken from the Atlantic Ocean. As much as 1500 parts per billion were found in zooplankton.

Soft shell clams taken from the Chesapeake Bay contained as much as 200 ppb. In a study of terns in Long Island Sound, a median concentration of 2.1 ppm of DDE was found in the flesh, but amounts of PCB ranged from 5 to 175 ppm. The lipids of osprey eggs taken from the shores of the Sound contained from 545 to 2270 ppm of PCB (*Chemical and Engineering News*, Dec. 13, 1971, page 32).

The extent of damage done by PCB in the environment is unknown. A worker at Cornell University found evidence of chromosomal damage in doves fed a diet containing 10 ppm of PCB. Although eggs of these doves hatched normally, only 20% of the progeny from the hatched doves survived. Birds from Bodega Bay in California have been found with twisted bills, deformed legs, and without flight feathers.

Monsanto, however, contends that no scientific evidence has been obtained to show that PCB causes birth defects. Rats fed a diet containing 100 ppm for 18 months showed slightly enlarged livers and dogs fed a similar diet showed somewhat less than normal weight gain. Chickens, however, said the company, lost weight, their eggshells thinned, and hatchability of the eggs decreased. But no embryonic deformities were observed.

So far, fowl seem to be the main sufferers of chlorinated hydrocarbons in the environment. Thus, the question arises: What would the world be like without birds?



Birth defect attributed to PCB pollution in a tern found on Long Island Sound

Courtesy Museum of Natural History

MONS 085213