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Chemical News

The polychlorinated biphenyl (PCB's), a class of industrial compounds with a wide variety of uses, have been suspected since 1966 of causing many of the same ill effects in organisms as DDT and other chlorinated pesticides. Gradually the evidence has accumulated, and now there is little doubt of their danger (SN: 3/28, p. 321).

Depending on the degree of chlorination, the PCB's are as toxic or more toxic than DDT. One experiment, for example, established that a PCB with 62 percent chlorine was almost twice as effective as DDT in breaking down the sex hormone estradiol in birds; this is regarded as the initial step in the mechanism by which egg shells of predatory birds (which have very high tissue concentration of both chlorinated pesticides and PCB's) are thinned, leading to high chick mortality and eventual extinction.

The most recent evidence came this month from the work of Dr. Lawrence McCloskey and Richard Chesher, who exposed corals to chlorinated pesticides and PCB's while they were *Tek-tite 2* aquanauts (SN: 10/10, p. 296). PCB's apparently act synergistically with chlorinated pesticides and enhance their effects, says Dr. Chesher. One of the potentially most serious results of the work was the finding that a mixture of PCB's and chlorinated pesticides will reduce oxygen production by plants associated with the coral after a relatively brief exposure at one part per million.

In the meantime, Monsanto Co., the sole United States manufacturer of PCB's, has greatly restricted the uses of these compounds, claiming it is now recommending use only as insulating fluids in electrical and heat transfer systems where the PCB's are completely enclosed, and thus not likely to get in to the environment.

But says Dr. Robert Risebrough of the University of California at Berkeley, a long-time foe of PCB's: "I'm not very optimistic. This electrical equipment is going to be thrown away eventually. With an expanding technology, I am afraid we will continue to have large amounts of these chemicals entering the environment."

And just how the PCB's have entered the environment—where they are now ubiquitous, although there are greater amounts near industrial areas—is still unknown. But many of the uses before Monsanto's Aug. 30 restrictions clearly were capable of releasing large amounts into the environment. Among these uses: plasters, for paper and fabric fire-retardant compounds, asphalt, adhesives, paraffins, printer's ink, rubber products, solvents for pesticides, lacquers, coatings for water-repellent canvas and as hydraulic fluids.

Recent work, however, has begun to provide at least an indication of sources, says Dr. Risebrough. PCB's have been found, he says, in municipal sewage entering Lake Michigan and in California. Further work may allow researchers to learn just how the PCB's enter the sewage.

Hampering the work has been Monsanto's reluctance to cooperate, claims Rep. William F. Ryan (D-N.Y.) a crusader against PCB's. Ryan says Monsanto has refused to provide him with a list of all uses, claiming this "would serve no useful nonpolitical purpose." And Dr. Risebrough says Monsanto also has refused to provide statistics on amounts of PCB's manufactured. A Monsanto spokesman admitted both charges this week, saying secrecy was necessary because Monsanto is the sole producer of PCB's.

The PCB's have unique advantages industrially because of their chemical stability. This stability is called persistence, however, in substances such as PCB's and chlorinated pesticides that do not degrade in the environment and thus are concentrated in food chains. Says Dr. Risebrough: Badly needed are programs for assessing the environmental impacts of new commercial substances before they become so widely used that we are economically dependent upon them.

(Science News).