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This Week's Citation Classic

Peakall D B & Lincer J L. Polychlorinated biphenyls: another long-life widespread chemical in the environment. *Bioscience* **20**:958-64, 1970. [Langmuir Laboratory, Cornell University, Ithaca, NY]

This was an early review of the chemistry and biological effects of polychlorinated biphenyls (PCBs). These compounds have been found to be globally distributed in the environment and to bioaccumulate to high levels. Subsequently, PCBs have been extensively studied. [The *SCI*® indicates that this paper has been cited over 140 times since 1970.]

David B. Peakall
National Wildlife Research Center
Canadian Wildlife Service
Ottawa, Ontario K1A OE7
Canada

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"I began studying the effects of polychlorinated biphenyls (PCBs) on birds soon after Jensen discovered these compounds in the environment in 1967.[1] These studies were suggested by J.J. Hickey, a noted conservationist at the University of Wisconsin, who was concerned that the chemical industry would try to shift the blame for environmental effects of DDT to this new class of compounds. But our first study, on the degree of microsomal enzyme induction, showed that PCBs actually had a greater effect than DDT.[2] We didn't let Hickey down completely, however; subsequent studies showed that the main cause of the decline of the peregrine falcon was eggshell thinning due to DDT and its metabolites and not to PCBs.

"The review in *Bioscience* was written while I was a senior research associate at Cornell University and Jeff Lincer was a graduate student. Jeff wrote the section on analytical methods of detection, the longest single section of the paper, which was his area of expertise. Although both of us received our initial training in chemistry, we both continue to be interested more in the effect of pollutants on wildlife at the intact animal and population level than merely the biochemical details of the process. In a phrase, we are a pair of bird-watching chemists.

"I believe the paper has been widely cited because it was one of the first reviews on a group of compounds that subsequently received a tremendous amount of attention. While the review is short, it covers physical properties, uses, analytical methods, toxicology, and environmental levels and thus is a convenient initial reference for workers in many areas of study. Through the kindness of other workers we obtained a good deal of data ahead of publication and this prevented the review from becoming dated too rapidly. To the best of my recollection the whole process from the initial start on the writing to final publication went rapidly and smoothly. Today such a comprehensive review of PCBs would be a formidable task requiring a series of books with thousands of references.

"In a decade PCBs have gone from unknown peaks on a gas chromatographic tracing which interfered with the detection of DDT to a pollutant widely known by the general public. PCBs have become a classic example of how a widely-used stable chemical can become globally distributed even though not deliberately added to the environment."

1. **Jensen S**. Report of a new chemical hazard. *New Sci.* **32**:612, 1966.
2. **Risebrough R W, Reiche P, Peakall D B, Herman S G & Kirven M N.** Polychlorinated biphenyls in the global ecosystem. *Nature* **220**:1098-102, 1968.