CURRENT
University of Missouri - St. Louis
Volume 5, Number 14
January 7, 1971

PCBs Another Threat To Environment

MONS 032248

(CPS)-Come the Silent Spring, when life on earth is dying and helpless man asks why, the names of those chemicals, pesticides and synthetics he has poured into his environment for the sake of "progress" will come back to haunt him.

Along with DDT, mercury, 2, 4,5-T, dieldrin, parathion and other deadly substances, the autopsy of earth will reveal another compound whose recently-detected effects are widespread, chronic, and insidious.

This latest chemical infiltrator is polychlorinated biphenyls (PCB), a special class of compounds with a great variety of household and industrial uses. The prevalence of PCB in the environment was not discovered until 1966, when Swedish scientists found it in concentrations as high as DDT.

Like DDT, the PCB compounds contain chlorine, hydrogen and carbon. Also like DDT, they are non-soluble in water, resistant to oxidation, accumulate in fatty tissues, and extremely persistent in the environment.

The major difference between the two is that DDT has been distributed deliberately, as a pesticide; the spread of PCB has been accidental, and no one knows exactly how it happens, where leaks occur nor how much escapes. But in the past four years, scientists have detected PCBs in fish, birds, water, trees, sediment and --inevitably--in human fat and mothers' milk.

In America, PCBs are manufactured solely by the Monsanto Company and sold under the trade name "Aroclor." They are also made by chemical companies in Europe and Japan and have been used extensively since World War II. PCBs can be purchased in containers ranging from 50-pound cans to 600-pound drums or are available by the railroad car tankload.

The unique qualities of PCBs make them useful as flame retardants, insulating fluids, plasticizers and coating compounds. Consequently, they may appear in a bewildering variety of consumer products, such as floor tile, flourescent lights, printer's ink, brake linings, swimming pools, adhesives, molded plastics, polyester film, paraffin, paints, carbonless copy paper, window envelopes, imitation gold leaf, varnishes, waxes, ceramic pigments, synthetic rubber and water-repellant canvas for camping equipment.

Industrial applications of PCBs include coolant fluids in transformers, capacitors and askarel-type transformers, hydraulic fluids, specialized lubricants, gasket sealers, electrical wiring, heat transfer agents and machine tool cutting oils.

In addition, the Monsanto technical sales bulletin recommends mixing PCBs with chlorinated insecticides to act as a vapor suppressant and sticking agent, so the insecticide may maintain its "kill-life" on hard surfaces for as long as three months. The bulletin also suggests blending insecticides into tacky PCB-coatings "to make insect traps or barriers on tree trunks for foliage or fruit protection."

With all of these uses, it is little wonder that PCBs are released into the environment in persistent forms, which can be distributed widely over the earth in water and air currents. Scientists have cited 5 chief ways in which PCBs get into the environment:

--from the smokestacks of the Monsanto plants (in Sauget, Ill., and Anniston, Ala.) where Aroclor is manufactured, from the stacks of plants which manufacture products containing Aroclor, and from European and Japanese PCB plants.

--from other forms of industrial waste, such as leakage of hydraulic fluids from supposedly "closed systems," which are seldom leak-proof.

--gradual wear and weathering of products (such as asphalt) containing Aroclor which may cause PCBs to be slowly released in the form of vapor or particles into the atmosphere.

--from products containing PCB which are thrown out as trash and eventually end up being burned in city dumps or incinerators, releasing PCBs in the form of highly toxic fumes.

Inhalation of PCBs in sufficient quantity produces nausea, vomiting, loss of weight, shortness of breath, lowered red blood cell count, loss of libido, and inhibition of carbohydrate metabolism. Jaundice and other severe liver damage may result in coma, atrophy, and death.

But like so many other environmental hazards, the dangers of acute toxicity of PCBs are probably less than the threat of chronic, long-term, low-level exposure, which cannot be measured or, so far, controlled. There have been no experiments as yet to learn chronic PCB effects on humans, but several studies have produced disturbing evidence of their effects on animals.

Very little data is available about PCBs in people. Both Swedish and British scientists have reported finding them in samples of human fat. They were first documented in human milk by two scientists at Colorado College.

Finally, last April, the dangers of PCB were called to public attention by Rep. William F. Ryan, Democratic Congressman from New York, who asked for action from various departments in the Nixon administration and called upon Monsanto to establish stricter controls on PCB use.

Ryan asked the Department of Agriculture to ban the use of PCB-containing pesticides, called for the Food and Drug Administration to require labeling of PCB products and to study a possible complete ban, and requested that the Department of the Interior take steps to protect fish and wildlife from the hazards of the pesticide.

Ryan's initiatives met with mixed results. The Agriculture Department replied that PCB pesticides would be discontinued and agreed to cancel their registration. However, it soon became apparent the "discontinue" and "cancel," in federal-regulatory jargon, don't automatically result in the drastic and conclusive actions which the words connote.

If Agriculture had chosen to "suspend" the pesticide registrations, the suspension would have taken force immediately and federal law would have stopped shipments of the products in interstate commerce. Department in-

MONS 032249

spectors could also seize stocks of the products in retail stores (although they seldom do because there are only 52 inspectors for all the thousands of retail stores in the country).

When the Agriculture Department merely "cancels" a registration, however, the manufacturing companies have 30 days before they must stop shipping the products in interstate commerce. If they appeal the order, even this mild restriction is lifted, and the company can continue to produce, ship, and sell the cancelled products during the lengthy process of appeal.

Furthermore, homeowners, gardeners, farmers or others who buy the products are free to use them in any way, even if contamination of large areas is the result.

The Federal Drug Administration in response to Ryan's request for labeling, merely promised to study the amounts and toxicity of PCBs in food. Even if cautionary labels are implemented, the labels on containers have no binding force on the purchaser, and there is no guarantee that the products will not continue to be used in harmful ways.

The Monsanto Company, in response to Ryan's inquiries, first responded with ambiguities and refusals to provide details, such as a list of PCB uses, production and sales figures. The company claimed, for example, that a complete list of PCB-containing products "would serve no useful non-political purpose."

But Ryan persisted, and in June, Monsanto finally agreed to restrict the use of PCBs to "closed-system applications," such as transformers, capacitors and heat transfer fluids. As of Aug. 30, Monsanto would no longer sell PCBs to customers for use in general plasticizer operations where disposal of the end-products cannot be controlled. The company also said that it would no longer sell PCB-containing hydraulic fluid ("Pydrual" is Monsanto's trade name) after Dec. 31, 1978. And finally, Monsanto said it would offer a recovery service for spent fluids used as coolants in transformers and other closed-systems, and begin research to develop modified, biodegradeable PCBs.

MONS 032250