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PCBs will be with us for a long, long time

EDITOR'S NOTE: Times intern Lorraine Ventura spent many hours in summer talking with local, state and federal officials about PCBs, a suspected cancer-causing chemical. In this, the last part of a three-day series, she studies PCBs longevity and where they're located in the environment.

By LORRAINE VENTURA

PCBs are the most persistent man-made chemical known today and profound "everywhere."

Most researchers won't even guess at how long it will take the clear, slightly oily, liquid toxin to biodegrade in the environment. They don't know at what level PCBs, a suspected cancer-causing substance, are toxic to man and can only guess at their long-term effects.

Thomas Kopp, Environmental Protection Agency (EPA) chemist and spokesman, is certain our grandchildren and great-grandchildren will be still hassling with the toxin. Estimates of PCBs' persistence in the environment range anywhere from 20 to 200 years.

"Practically all fish in the lakes and streams of this country (when tested) will show some levels of PCBs," said Kopp about the toxin. Its main route to humans is through freshwater fish. PCBs, or polychlorinated biphenyls, have been identified in almost all species, including man, he said.

PCBs have been found everywhere from seals in the Baltic Sea to trout in Seneca Lake. They've been measured in the air and in surface waters of the Atlantic Ocean.

By the time the first scientific evidence in 1961 started to suggest the long-time presence of PCBs in the environment, they were being used not only in electrical insulators, transformers and capacitors but also in ink, carbon paper, heat transfer and florescent lights, television sets and mining equipment.

Their extreme stability and their non-conducting and nonflammable characteristics increased their use in innumerable products as well as making them invaluable to industry.

The Monsanto Co., the only producer of PCBs in North America, will stop producing the chemical in October because "the risk to the environment (from PCBs) is great," said spokesman Gary Barton.

"I think that what a lot of scientists and researchers are still finding (in the environment) are traces of PCBs" manufactured prior to 1971, said Barton. Monsanto, which first produced PCBs in 1929, limited its sales after that year to major electrical equipment manufacturers using "closed systems," systems designed to protect against the toxin's being released into the environment.

In their peak year, 1971, the company sold 85 million pounds of the toxin to customers worldwide. At present, it sells about 27 million pounds to 40 primarily American customers. PCB production at Monsanto's United Kingdom factory will cease sometime in November or December, said Barton. PCBs are also manufactured in France, Germany, Italy, Spain and the Soviet Union.

Careless disposal of products containing PCBs and accidents like breaks or spills, help PCBs find their way into the environment. In lakes, they sink to the bottom into the sediment. PCBs are slightly soluble in water and may be found there in small amounts.

"Almost any kind of fish can absorb PCBs through their gills from the water and also from contaminated food that the fish are eating," said Kopp. But PCBs are found more often in bottom-feeders and in high fat species of fish (like lake trout).

It's possible, he said, that they find their way into waterways through rain. "We hope that it gets buried in time" in the sediment, said Kopp. "It moves in the environment much more readily than anyone ever expected."

Much depends on the individual body of water, he said. If the water doesn't sit long — if there's a rapid changeover rate — then PCBs don't have time to move from the sediment to the water.

The older and larger fish which have higher fat contents, and thus have higher PCB levels. Since the older fish are the ones involved in reproduction, said Kopp, the eggs are contaminated with PCBs transmitted from the parent fish.

"There's a definite reproduction problem with trout in Lake Michigan and with striped bass on the (Atlantic) coast. There's fewer and fewer striped bass...we're not going to have striped bass around very much longer if this keeps up," said Kopp.

Although Congress added a clause to the toxic substance and control act to prohibit by 1979 the importation of items manufactured using PCBs, and even though Monsanto will voluntarily stop production of PCBs three months prior to the EPA standards set for 1977, the toxin will be around us for quite some time.

According to EPS's May support document for the proposed marking and disposal regulations, of roughly 1.25 billion pounds of PCBs purchased by U.S. industry since 1929, about 65 million pounds (about 6.4 per cent) has been destroyed by incineration or degradation in the environment.

"About 60 per cent of the total domestic sales is still in service — almost all in capacitors and transformers," the document states. The remaining 440 million pounds is in the environment.

Although methods are being devised to guard against PCBs getting into the environment, the document said, "It is estimated that about 290 million pounds are in landfills or dumps and 130 million pounds are 'free' in the general environment (air, water, soil, sediments)."

With the amount of PCBs in land fills and dumps, about twice that already in the environment, it's likely it will become widely dispersed over a long period of time.

The average life of capacitors and transformers is anywhere from 15 to 40 years and they will probably become obsolete before they're no longer usable. And many consumer items contain the toxin.

So the problems of PCBs will most likely remain for quite some time. PCBs will continue to find their way into the air and water while accumulating in man and other living species.

"We have to control what we dump in the future," said Kopp. "We can't add any more to the environment."



Trout pride

Genevans are proud that their city is trout capital of the world and home of the national lake trout derby contest. However, detection of PCBs in the lake's trout could some day have an effect on the fishing here. (Times photo)

Chemical's danger irritates chemist

By LORRAINE VENTURA

Thomas Kopp is adamant about the dangers of PCBs.

"It (the toxin) is more persistent in the environment than anyone ever expected...than any other man-made chemical we know of today," said Kopp, a chemist with the Food and Drug Administration's (FDA) toxic substances office.

Continuing, he said that the toxin has been measured in the air and water and in all species, including man, in essence, Kopp said PCBs are "everywhere."

"We know PCBs are extremely persistent," he said. "The degradation (breakdown)in the environment is something we still do not know about."

When asked how long it will take PCBs to biodegrade, Kopp skirts the question: "They're extremely persistent," he offers.

He similarly avoids giving his opinion about PCBs possibly not being completely or satisfactorily biodegradable. "They'll be with us for a long time," is his reply.

It's the uncertainty surrounding the toxin that bothers Kopp as well as other researchers involved with PCBs.

And like most researchers, he insists PCBs under five or two parts per million in fish don't represent a health hazard and that the main concern is with fishermen who consume a lot of fish that may be contaminated with PCBs.

Kopp is far from a contemporary *alarmist*. Yet unlike others, he can paint a gloomy picture about the lasting effects of PCBs and the uncertainty of its effects on the environment and living things. But it's a picture painted with facts.

"We know there is an accumulation (in the body of PCBs) but to what extent we don't fully understand." He explains that although PCBs are stored in the body's fat, especially deep fat, stress situations may bring the substance traveling back through the body. And who knows what this may cause?

Kopp can ramble on about tests where PCBs damage the liver in animals, or trigger pre-cancerous conditions; they've been shown to diminish the offspring of fish and animals and decrease the survival rate.

He cites findings of tumors in PCB-contaminated fish and says PCBs affect newly hatched frys. The substance, he said, is "everywhere."

"Congress told us to ban PCBs," he points out.

Silicone will replace PCBs in industrial use. Will that just be replacing one harmful chemical with another?

Silicone is a much better alternative, he said.

Kopp maintains his "pit in a day's work" tone while saying that over 90 per cent of all people measured have detectable levels of PCBs in their body fat and that practically all tests of mothers' milk shows detectable levels.

But the tone changes when he talks about PCBs in the environment.

"We hope it gets buried (in the sediments of the waterways) in time. "It moves in the environment much more readily than anyone ever expected.

"We have to stop adding to the environmental load. That's why the strong controls."

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